The Theory and Practice of Entrepreneurship

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Frontiers in European Entrepreneurship Research

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IN ASSOCIATION WITH THE ECSB

Edward Elgar
Cheltenham, UK • Northampton, MA, USA

Published by
Edward Elgar Publishing Limited
The Lypiatts
15 Lansdown Road
Cheltenham
Glos GL50 2JA
UK

Edward Elgar Publishing, Inc.
William Pratt House
9 Dewey Court
Northampton
Massachusetts 01060
USA

A catalogue record for this book
is available from the British Library

Library of Congress Control Number: 2010922148

ISBN 978 1 84980 379 3

Printed and bound by MPG Books Group, UK

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Foreword

Welcome to the fifth RENT anthology, a collection of the best papers presented at the 22nd RENT Conference which was hosted by the University of Beira Interior, Covilhã, Portugal. This anthology was compiled following a rigorous academic review process that equates with that employed by the top academic journals. It offers the European Council for Small Business and Entrepreneurship (ECSB) the opportunity to showcase the exciting research that is being undertaken across Europe while giving academic recognition to those whose work is featured in the publication.

The high quality of the papers in this year's anthology represents further the successful decision taken by the Board of the ECSB at the beginning of the millennium to establish a thorough review process for conference submissions, which allows only the better abstracts to be accepted. The relatively low rates of acceptance that followed on a yearly basis have occasionally caused disquiet, but the high standard of papers continually being delivered at RENT conferences has received widespread approval. These high standards have also ensured that the flagship event of the organization accurately represents the work of the ECSB more broadly in terms of its significant contribution to the enhanced quantity and quality of entrepreneurship research found in Europe today.

Besides the RENT conference and its subsequent anthology, the ECSB offers a wide range of services and benefits to its members. The large package of support that you will receive as a member includes access to a network database, reduced rates for conferences and publications, online activities such as webinars, special interest groups, competitions, a free copy of the *Journal of Small Business*, and many others that are specifically tailored for entrepreneurship researchers and educators. You are encouraged to go to the organization's website at www.ecsb.org to explore the full set of offerings that make this network an important resource for people working in the field of entrepreneurship research.

I wish to conclude by thanking the editors and reviewers whose generosity of time and spirit has brought this publication to fruition. As successful professions who have to meet the ever-increasing demands of educational institutions, their willingness to proactively support our publications helps

to enhance the overall brand of the organization. The Board and members of the ECSB are indebted to you for your invaluable contribution.

Thomas M. Cooney
President, ECSB

1. Introduction

David Smallbone, João Leitão, Mário Raposo and Friederike Welter

INTRODUCING RENT XXII IN COVILHÃ

This volume represents a selection of best papers from the 137 presented at the RENT XXII Conference held at the University of Beira Interior in Covilhã, Portugal, 20–21 November 2008. As such, it provides a window on contemporary European research in the field of entrepreneurship and small business. Although varied in terms of the topics covered, all of the selected papers contribute in some way to the overall conference theme of 'Entrepreneurship as an engine of regional development'.

The venue for the 2008 conference was particularly appropriate for this theme, in view of the key role being played by entrepreneurship in the development of this part of Portugal. In fact, entrepreneurship has been a strategic driver for creating employment, increasing income, facilitating the adjustment to economic change and supporting competitiveness at the local level. Nevertheless, in order to foster entrepreneurship at the regional level, there is a need to strengthen the role played by entrepreneurial universities, especially, in terms of entrepreneurship education oriented towards innovation and endogenous growth. The aim is to develop the entrepreneurial orientation (EO) of undergraduate and graduate students, and of university staff.

In this sense, the institutional hardware at the regional level needs to be redesigned to reflect both traditional and emerging production and service activities. The aim should be to identify groups of innovative firms associated with activities geographically concentrated around entrepreneurial universities, acting as a driving force of innovation and regional development. These activities should be the foundation for redesigning regional systems of innovation based on extended institutional networks oriented towards cooperation between public and private sector institutions.

INTRODUCING THE CHAPTERS

It is increasingly recognized that higher education institutions are a potentially important vehicle for stimulating and facilitating entrepreneurial activity at a regional level. At the same time, there is considerable variation between universities in the extent to which this potential is fulfilled. In this context, Chapter 2 by Mario Geissler, Steffen Jahn and Peter Haefner focuses on the internal organizational factors, which can affect the extent to which an institution is able to achieve its potential economic development role. In contributing to the literature on so-called 'entrepreneurial universities', the concept of entrepreneurial climate is introduced, as part of a framework for linking various organizational conditions with university members' perceptions of entrepreneurship. From their review of existing literature on academic entrepreneurship, the authors note a tendency for previous studies to focus on intangible influences, such as incentive and reward systems for staff, which they use as justification for focusing instead on less tangible factors that may influence a university's entrepreneurial climate.

The empirical investigation is based on staff and student survey data from three German universities. The results are analysed using partial least squares structural equation modelling to test the proposition that specific tools and events significantly contribute to a university's entrepreneurial climate. The results show important differences in the perception of staff and students. Whereas qualification programmes were the most important influences shaping the entrepreneurial climate for students, they were rated least important by faculty members, who stressed instead the influence of role models. The introduction of the concept of entrepreneurial climate and its empirical application represent a valuable addition to the literature on entrepreneurial universities, as well as having important potential implications for policy makers interested in increasing the contribution of universities to regional development.

University spin-offs are one of the mechanisms for universities to act as agents for knowledge and technology transfer, providing a focus for Chapter 3. Based on recent empirical evidence from Catalonia, the study by Pablo Migliorini, Christian Serarols and Andrea Bikfalvi focuses on spin-offs from so-called 'non-elite' universities, drawing on resource-based theory, institutional theory and stage-based models of venture development. The study employs a multiple case study, qualitative methodology, applied to 11 spin-off companies from two universities in the region. Key thresholds are identified in the development of these ventures, related to opportunity recognition, entrepreneurial commitment, establishing credibility and sustainability. The necessary resources and institutional factors

influencing how entrepreneurs can overcome these critical junctures are also identified. For budding academic entrepreneurs and policy makers alike, the study demonstrates how having a breakthrough technological innovation is not enough to secure business success. The background of founders, their social capital, market knowledge and management experience are all important factors contributing to the successful development of their businesses.

Another way of stimulating high value added entrepreneurship and innovation is through programmes designed to encourage knowledge and technology transfer. In this context, Chapter 4 by Verena Eckl and Dirk Engel focuses on Germany's Industrial Collective Programme (ICR), which supports pre-competitive research. Pre-competitive research refers to knowledge creation at research institutes and knowledge transfer to industry, rather than the commercialization of new ideas. Within the ICR programme, industrial research associations initiate publicly funded research projects, which are carried out by non-profit oriented research institutes. Each project is monitored by several firms in a board of project observers.

The study aims to fill a gap in the evidence base concerning the extent of knowledge transfer from science to industry through publicly funded programmes. Introduced in the 1950s, the ICR programme aims to support knowledge transfer to small and medium-sized enterprises (SMEs) in particular. The central research question focuses on comparing SMEs with large enterprises as recipients of scientific knowledge, based on their propensity to use ICR results. Survey data of participants and non-participants in the ICR programme are analysed using binary probit techniques. Semi-structured interviews were also undertaken with representatives of industrial research associations. The findings show that affiliation to industrial research associations was the most common factor influencing firms' absorption of ICR results; although linkages to university research institutes were an important secondary influence. In terms of firm size, the results of the multivariate analysis suggested that the propensity to use ICR results do not differ significantly between large-firm and SME participants. In interpreting the findings, the authors recognize that collaboration between SMEs and large enterprises is likely to influence any simplistic large-firm–SME comparisons of the use of research results.

One of the features of entrepreneurship in most countries is the lower rate of involvement in business ownership of women compared with men. As a consequence, a common response of policy makers is to support training programmes for women interested in entering entrepreneurship. In this context, in Chapter 5 Janice Byrne and Alain Fayolle offer some new perspectives by critically addressing the case for gender-based small

business training programmes. Drawing on both feminist theory and the entrepreneurship education literature, the authors apply a teaching model framework. This incorporates programme objectives and goals, target audiences, evaluation and assessment, course content and pedagogy, which are used to examine women's entrepreneurship training. A central tenet of the chapter is that an ontological interrogation of conceptions of women's entrepreneurship training highlights a variety of (often implicit) feminist assumptions.

If entrepreneurship training for women is intended to rectify the imbalance in entrepreneurial activity between the sexes, the authors argue there is an inherent assumption of what the problem is, which is interpreted differently through the lenses of liberal feminists, social feminists and social constructionist feminists. As a result, there are three different ways of conceptualizing women's entrepreneurship training through feminist eyes. Training may be a way of circumventing obstacles and discrimination (liberal feminist view), or a way of addressing women's unique entrepreneurial abilities (social feminist view), or it may be of questionable value, since it may further reinforce women's subordination (social constructionist feminist view). This is a thought-provoking chapter, which places entrepreneurship research into the wider context of feminist and education theory.

The increasing interdependence of regional and national economies is recognized in two chapters on internationalization in SMEs. In Chapter 6, Niina Nummela, Sami Saarenketo, Eriikka Paavilainen-Mäntymäki and Kaisu Puumalainen focus on the role of knowledge and experience in the internationalization of knowledge-intensive firms. The aim is to empirically examine whether and how prior experience influences the internationalization trajectory of knowledge-intensive firms. Three main propositions are derived from the extant literature related to the positive impact on a firm's internationalization: first, prior international work experience in the entrepreneurial team; secondly, prior entrepreneurship experience; and thirdly, having someone in the team with international education. A web-based questionnaire was used to gather data from SMEs in the technology-driven information and communications technology (ICT) sector in Finland. Analysis included the use of logistic regression, with internationalization as the dependent variable.

The results show some notable differences in orientation towards internationalization between habitual and novice entrepreneurial firms, although somewhat surprisingly, novice entrepreneurial firms had a stronger international growth orientation than their habitual counterparts. Prior experience did not seem to have much influence on the speed and intensity of internationalization, but international work experience and education was associated with a tendency to follow a born global or

internationalization strategy, rather than remaining focused on the home market. The overall conclusion was that the findings highlight the importance of previous entrepreneurial start-up experience (that is, habitual entrepreneurial firms) with respect to internationalization, not in isolation but in the context of other experience factors, such as international work experience and education.

Chapter 7 is also concerned with the internationalization of SMEs, although with a different emphasis. The research undertaken by Christos Kalantaridis and Ivaylo Vassilev focuses on networks of firms and inter-firm relationships, exploring the nature of backward and forward linkages established by what they describe as globally integrated small firms. The analysis uses insight from transaction cost economics and the global commodity chain literature to interpret the results. Empirical analysis is based on interviews with 775 senior managers in five European countries: the UK, Greece, Poland, Estonia and Bulgaria. Large firms were included in the study as well as SMEs, enabling comparative analysis to be undertaken across the firm size range. Hierarchical cluster analysis was used to explore the nature of relationships between firms of different sizes.

The chapter demonstrates that there is a small minority of small firms that are capable of engaging in global production and distribution networks, with broadly similar types of relationships to those involving medium and large-scale enterprises. The differences are greatest where small firms are managing both forward and backward linkages and/or supply relationships involving a number of suppliers. As well as questioning over-simplified firm-size based generalizations about barriers to internationalization, the chapter also questions widely held views concerning the role of power asymmetry in small firms' international linkages. It is suggested that globally integrated small firms may sometimes occupy positions of power derived from their position in the supply chain and/or proximity to rich markets. Overall, the chapter offers some new perspectives on small firm internationalization, which justify further investigation.

It is increasingly recognized that business exits have an important potential role in entrepreneurial economies, by enabling resources (including human capital) to flow from less to more productive uses. At the same time, the empirical evidence base of entrepreneurial exit processes is limited, not least because of the difficulties involved in identifying and gathering data from former entrepreneurs. In this context, Chapter 8 by Satu Aaltonen, Robert Blackburn and Jarna Heinonen focuses on the perspectives of owner managers who have exited from a business, drawing on empirical evidence from Finland and the UK. It explores different exit situations, the reasons for exiting and the effect of the exit experience on entrepreneurs' future intentions with respect to entrepreneurship. Data

were collected from entrepreneurs who had exited a business through a combination of postal and telephone survey methods. Analysis was based on a combination of bivariate and multivariate methods. Hierarchical logistic regression was used to explore the factors associated with entrepreneurs' exit experience.

The results showed that the largest group of respondents (43 per cent) reported good exit experiences, despite negative reasons for exit. The second largest group (35 per cent) reported good exit experiences and positive exit reasons. The third group (16 per cent) exited mainly due to a lack of financial rewards or health reasons; and a further 5 per cent were discouraged by the exit experience, despite positive exit reasons (for example, retirement or another job opportunity). The first two groups in the classification may use what they had learned in future entrepreneurial activity, whereas the latter two groups are unlikely to re-enter entrepreneurship. Overall, the study found a statistically significant relationship between entrepreneurs' perceived learning outcomes and exit experience. Most entrepreneurs exiting a business reported experiencing some learning, which supports the view that business exits should not necessarily be considered as failure.

For many years, the experience of Italy's industrial districts and SME networks have attracted the attention of policy makers throughout the world, interested in re-creating their dynamism in other regions. However, in recent times there is evidence that these districts are facing difficulties in adapting to increasing global competition. In this context, in Chapter 9, Emilio Esposito, Pietro Evangelista, Vincenzo Lauro and Mario Raffa report on an exploratory study of the virtualization potential of SME networks, which could provide a mechanism for successful adaptation. The chapter has two main aims: first, to identify alternative virtual enterprise models in the existing literature; and secondly, to undertake field analysis focused on a network of SMEs.

A variety of virtual enterprise models are identified, with two extremes: the hierarchical and holarchical virtual enterprise models. In the case of the hierarchical model, a leader company (generally a large firm) allocates the manufacturing tasks among partners, coordinating the entire network of firms and managing the knowledge and information flows. This company also acts as product integrator, as it is responsible for the final product/service and relationship with the customer. In contrast, the holarchical virtual enterprise model has no hierarchical coordination unit; self-organization is the main coordination mechanism. This approach appears particularly suitable for SMEs, although knowledge and information flows need to be integrated. As a consequence, the success of this type of model depends on all partners cooperating as a single unit.

The empirical analysis analysed a network of East Naples high-technology enterprises (ENES). A questionnaire survey was used to assess the extent to which there is evidence of the network evolving towards the virtual enterprise model, in which the development of collaborative projects is the main objective of partnership. The results show that the most frequent forms of relationships between firms involve sharing new product development programmes and exchange of technical information. It is also shown that the most important information that firms are willing to share concerns linkages with institutions and funding opportunities. The East Naples high-technology enterprise system is characterized by a set of temporary peer relationships oriented towards specific projects in which collaborative relationships are continuously formed and re-formed. On this basis, the authors suggest the region may be considered a potential pool of virtual enterprises, based on a hybrid of the hierarchical and holarchical types identified above.

Interrelationships between firms are also the focus of Chapter 10, although in this case the focus is on strategic alliances, and specifically on the implications that involvement in learning through inter-organizational alliances has on a firm's entrepreneurship. Ana Maria Bojica, María del Mar Fuentes Fuentes and Matilde Ruiz Arroyo are concerned with how knowledge acquisition through a strategic alliance influences a firm's level of entrepreneurship and how this interacts with the knowledge-based resources of the firm. The research is grounded in the Austrian School's theory about the role of knowledge in the entrepreneurial process and the implications of a relational perspective for organizational entrepreneurship.

Three hypotheses were drawn from existing literature concerned with relationships between the acquisition of knowledge through inter-firm alliances, the firm's knowledge-based resources and the level of organizational entrepreneurship. The hypotheses are tested on a sample of new-technology based SMEs in Spain. The proposed relationships are investigated using linear hierarchical regression, with organizational entrepreneurship as the dependent variable. The results show that prior knowledge and acquisition of knowledge through strategic alliances have a positive influence on organizational entrepreneurship. However, the results indicate that for firms with a greater base of prior knowledge, using a deliberately exploratory strategy for knowledge acquisition through strategic alliances may have negative repercussions on the firm's level of entrepreneurship in the short term. The smaller the base of prior knowledge, the more advisable it is to use an exploratory strategy of alliances to attract the resources needed in the entrepreneurial process.

The chapter shows first that both prior knowledge and the acquisition of new knowledge through an alliance influence organizational

entrepreneurship positively; secondly, a negative moderating effect of knowledge acquisition on the relationship between the firm's knowledge base and organizational entrepreneurship; and thirdly, the important role of the context of the firm and specifically its relationship with peers. The results are of potential interest to policy makers where strategic alliances could be seen as a potential knowledge transfer mechanism for a region's SMEs.

One of the challenges faced by newly created ventures is to establish legitimacy with various stakeholders. In this context, Chapter 11 is concerned with the impact of legitimacy building signals on access to resources. The study, by Cristina Díaz Garcia and Juan Jiménez Moreno, aims to find out if business owners can procure more resources by sending signals of legitimacy to their environment through their personal characteristics and social capital. Institutional theory and social network theory is used as an interpretative frame of reference. Three hypotheses are tested with respect to favourable access to critical resources. The first relates to human capital (education level, experience, time devoted to the firm), the second to business owners with specific social capital (structural, cognitive and relational dimensions) and the third, to the moderating role of gender.

The empirical data were drawn from a survey of firms in knowledge-intensive industries, with less than 50 employees and founded in or after 2002. Analysis showed some differences between the indicators of legitimacy building signals for men and women business owners. Access to resources was significantly predicted by business owners' age and educational level. However, devoting more hours to the business per week is negatively related to a favourable perception of access to external resources. With respect to social capital, those with more problems in meeting business people outside their inner circle, and those with less durability in their relationships with their key contacts have a less favourable perception of their access to resources. The authors suggest that policy makers should encourage and facilitate networking in order to allow business owners to gain wider access to business people who can provide valuable resources and information for them. For women entrepreneurs who might suffer some legitimacy problems due to their tendency to start business at a younger age than men, networking can help to build a bridge between agency and structure.

The concept of EO has been attracting increasing attention in the entrepreneurship literature, which is reflected in the next two chapters. In Chapter 12, Tatiana Iakovleva applies the concept in the context of the Russian Federation, where private entrepreneurship is a relatively recent phenomenon. Entrepreneurial orientation incorporates innovativeness, risk-taking and proactive action, such as opportunity seeking. A key

focus of the chapter is the relationship between resources and entrepreneurial orientation. Hypotheses are tested in relation to two main research questions: first, do firms with unique resources report superior EO and, secondly, do firms controlled by entrepreneurs citing high levels of self-efficacy report superior EO?

Survey evidence was gathered from a sample of 466 managers of small enterprises (SE) in St Petersburg in 2004. Analysis was based on entrepreneurial orientation as the dependent variable (with nine measures) and firm resources (financial capital, organizational capital and social capital) and self-efficacy (in relation to opportunity competence, risk competence and financial competence) as the independent variables, with three control variables (industrial sector, markets and the role of respondents in the firm). Ordinary least squares regression was used to test the specified hypotheses. Analysis showed that firm resources are associated with almost 11 per cent of the variance in EO; and self-efficacy variables together explain about 18 per cent of the variance. The author discusses various reasons why the results are weaker than expected, including the possible role of context-specific factors.

Chapter 13 by Jorunn Grande is also concerned with the role of entrepreneurial orientation (EO) and firm-specific resources; in this case in relation to business performance. The study aims to fill a gap in the existing literature by focusing on microenterprises and on a specific industrial context. Two key research questions are examined: first, how does the EO pattern differ between firms in an agricultural and a non-agricultural firm context? Secondly, what is the relationship between EO, firm-specific resources and performance in the two firm contexts? A series of specific hypotheses are tested in relation to each of these, based on a sample of Norwegian firms participating in a regional innovation programme offered by Innovation Norway, which is a governmental agency aiming to enhance innovation in Norwegian trade and industry through networks, competence and funding.

Data were collected using a combination of a mail questionnaire and telephone interviews with the businesses' manager or owner. The study has a longitudinal element since 306 firms were surveyed in 2003 and 2006. A multiple performance measure for 2006 was used as the dependent variable with 2003 resource variables entered into the model as independents. Firm size and performance in 2003 were entered as control variables. Analysis of the mean and variance for the two groups indicates a significant difference in EO level between the two firm contexts. In terms of the relationship between EO, resources and performance, the regression results indicate that both agricultural and non-agricultural microenterprises are likely to receive higher returns for their entrepreneurial efforts. Interestingly, the

study shows that agricultural firms, traditionally restricted in their opportunities by operating in heavily regulated markets and mature industry status and traditions, get even more benefits from engaging in entrepreneurial activities compared to their counterparts in other business sectors. This suggests that the benefits from possessing unique competence might depend on a firm's context. Overall, the results suggest that policy makers and business owners should pay attention to the importance of entrepreneurial efforts and skills in order to increase the potential for value creation in micro-size firms.

The final chapter, by Heiko Bergmann and Daniel Baumgartner, is concerned with the nature of entrepreneurship in urban and rural contexts. The chapter compares attitudes towards entrepreneurship of individuals, seeks to identify differences in the factors influencing business start-ups and compares new firm characteristics in urban and rural Switzerland. The main source of data used to investigate urban–rural differences in attitudes towards entrepreneurship, and the factors influencing it, is the adult population survey of the GEM project for the years 2005 and 2007. Swiss statistics of company demographics are used to investigate differences in new firm characteristics.

Overall, the results show that the urban–rural differences identified in attitudes towards entrepreneurship, and the reasons given for engaging in entrepreneurial activities, are less than might have been expected. However, differences are identified in the determinants of entrepreneurial activity. While the results for urban areas are in line with the results of other studies on regional entrepreneurship, start-ups in rural areas appear to be launched independently of the entrepreneurs' previous entrepreneurial experience. Differences are also observed in the characteristics of new businesses created, particularly with regard to the use of new technologies, which is considerably higher in urban start-ups compared with those in rural areas. As the authors point out, the fact that the urban–rural differences are less clear-cut than in some other studies may be in part a reflection of the context in Switzerland. Switzerland is only a small country with a well-developed infrastructure, which means that urban–rural differences in accessibility may be fewer than in other larger countries. Nevertheless, a number of differences in the entrepreneurial process are observed.

CONCLUDING REMARKS

The selection of papers included in this volume gives a flavour of the themes and approaches featuring in contemporary entrepreneurship research in Europe. The collection reflects the methodological diversity

that is typical of European research, as well as heterogeneity in terms of topics studied. Despite the fact that RENT is a scientific rather than a policy oriented conference, all papers include in this volume have potential implications for policy makers.

Policy-relevant topics covered include: features of entrepreneurial universities; the characteristics of successful spinout companies from non-elite universities; the nature and extent of SME involvement in technology transfer from publicly funded programmes; the rationale for women-only entrepreneurship training programmes; the role of learning and experience in the internationalization strategies of SMEs; the nature and extent of involvement of small firms in globally integrated production and distribution networks; the experience of entrepreneurs involved in business exits; the potential of virtualization as an adaptation mechanism for industrial districts; strategic alliances as a source of knowledge for SMEs; the effect of legitimacy building signals on access to resources for young firms; the role of entrepreneurial orientation in business performance, in different contexts; and urban–rural differences in entrepreneurial processes.

As an applied field of study, it is important that academic researchers maintain a dialogue with policy makers and practitioners. Organizations such as the European Council for Small Business and Entrepreneurship (ECSB), and the International Council for Small Business (ICSB), its global equivalent, provide a forum in which such dialogue can take place.

2. The entrepreneurial climate at universities: the impact of organizational factors

Mario Geissler, Steffen Jahn and Peter Haefner

INTRODUCTION

The transfer of (technological) knowledge from universities to the marketplace has received increasing attention during the last decades due to its positive effects on social and economic development, regional development, the diffusion of technological innovations and university revenue (Degroof and Roberts 2004; Friedman and Silberman 2003; Mansfield 1991; Niosi 2006; Varga 1999). Overall, knowledge transfer can take various forms, for example, patenting, licensing, research contracts or academic spin-offs. Academic entrepreneurship, in terms of companies specifically created to exploit technological knowledge originated within universities (Grandi and Grimaldi 2005), is one way to facilitate this transfer and to establish new enterprises with innovative knowledge and technologies as their key strategic resource and competitive advantage. Furthermore, spin-offs are probably the most visible form of the commercialization of university research (Landry et al. 2006).

In this respect, specific tools have been introduced in order to foster venture creation (for example, incubators, science parks, departments of entrepreneurship, technology transfer offices, funding programs). However, these tools primarily target persons at a more advanced venture creation stage. In contrast, little attention has been paid to the question of how different groups of university members (that is, faculty members, students) perceive these structural elements and how those perceptions influence their view on entrepreneurship at their institution.

Hence, a more holistic approach is needed which is able to capture the full entrepreneurial potential at universities, enabling an even more effective technology transfer process. We provide a framework that links different organizational conditions with university members' perceptions of entrepreneurship. Central to this framework, we introduce the concept of

a university's entrepreneurial climate, understood as university members' perceptions of the entrepreneurial environment at their university.

The notion of the climate concept in the field of academic entrepreneurship seems to be promising as research on climate in other disciplines suggests links with satisfaction, quality perception, performance, involvement and behavior (Anderson and West 1998; Glisson 2007; Katz-Navon et al. 2005; Liao and Rupp 2005; Ostroff 1993; Riordan et al. 2005). When we consider entrepreneurial climate as part of the overall organizational climate, we are introducing a new facet that interfaces with other 'sub climates' like innovation climate, justice climate or service climate. Given the proven links between climate concepts and positive outcomes such as performance or satisfaction, the concept of entrepreneurial climate does contribute to entrepreneurship research.

THEORETICAL BACKGROUND

Entrepreneurial Climate

Overall, organizational climate has been conceptualized as the employees' shared perception of different organizational characteristics, such as organizational events, procedures and practices (Patterson et al. 2005). Thereby, two research streams can be distinguished: research on organizational climate and research on psychological climate (Hellriegel and Slocum 1974; James and Jones 1974; Schulte et al. 2006). At an individual stage, one's own perceptions of the organizational environment constitute 'psychological climate'. At an organizational stage, if the single members of the organization agree on their perceptions of their work environment, the aggregated individual perceptions form the organizational climate (Patterson et al. 2005). Furthermore, the organizational members' perceptions are supposed to be primarily descriptive rather than affective or evaluative (Schneider and Reichers 1983). If there are differences in the characteristics of the work environment (for example, interactions, work conditions or managerial behavior) among different units within an organization, different levels of organizational climate may occur (Zohar 2002).

Research has deconstructed the notion of a generalized organizational climate into different dimensions or sub-dimensions during the last decades. Schneider and Reichers (1983) argue that the concept of climate needs to have a specific reference otherwise it is meaningless. We therefore analysed specific organizational facets and a range of different climates, for example, climate for service (Schneider et al. 1998), justice (Liao and Rupp 2005;

Naumann and Bennet 2000), innovation (Anderson and West 1998; van der Vegt et al. 2005) or safety (Katz-Navon et al. 2005; Wu et al. 2007).

Entrepreneurial climate, as used here, refers to the work environment at universities and thereby to an organizational level. The specific reference in the setting outlined is entrepreneurship. Hence, it describes the university members' perceptions of entrepreneurial activities and academic start-ups within the university.

Entrepreneurial Climate and Entrepreneurial Culture

As well as distinguishing psychological and organizational climate, we must differentiate the latter from the concept of culture. Since there is a conceptual and definitional overlap, the terms climate and culture have sometimes been used interchangeably (Crane and Meyer 2006; Patterson et al. 2005).

The concept of organizational climate was first mentioned in the 1950s. In contrast, the concept of organizational culture is much younger and was introduced into organizational literature in the 1970s. In the 1990s both constructs were discussed together for the first time and researchers tended to be confused about their similarities and differences (Glisson 2007). When reviewing present research, we must note that both concepts are employed with different meanings (Denison 1996; Glisson et al. 2008; Rentsch 1990; Schein 2000).

In an organizational context, both constructs are similar concepts referring to the impact of the organizations' contexts on their members' behavior (Denison 1996). Organizational culture refers to the deep-rooted structure of organizations, which could be understood and described as a pattern of basic assumptions that are held by organizational members that guide their behavior. Therefore, research on organizational culture analyses why organizational members behave in the way they do (Schein 1990). In contrast, climate refers to the members' perception and describes how the organization and their members act. Thus, Schein (1990, 2000) distinguishes climate as a surface manifestation of culture.

Furthermore, climate and culture studies have a different time frame. Culture studies mostly focus on the historical evolution and therefore the creation of the social environment within an organization. Research on climate rather provides an ahistorical snapshot of the way the players in organizations perceive the organization and their impact on it (Denison 1996). Owing to the differences in the respective objectives, different research methods are employed. Research on culture often uses qualitative methods while results in climate research are obtained through analysing quantitative survey data.

As Denison (1996) states, the most significant difference between both

Table 2.1 Contrasting organizational culture and organizational climate

Differences	Organizational culture	Organizational climate
Level of analysis	Deep-rooted – exploring underlying values and assumptions	Superficial – describing surface level manifestations
Temporal orientation	Historical evolution	Ahistorical snapshot
Methodology	Qualitative field observations	Quantitative survey data
Theoretical foundations	Social construction; critical theory	Lewinian field theory
Role of the individual	Agent and subject simultaneously	Separated from the social context

research streams lies in the theoretical foundations of the concepts. He points out that climate literature could be traced back to the field theory of Kurt Lewin (1951) and culture literature about the perspectives of symbolic interaction and social construction by Mead (1934) and Berger and Luckmann (1966). As a consequence, climate research separates the person from the social context whereas culture research denies this view and treats members in social systems as being agents and subjects simultaneously. Table 2.1 gives an overview of the differences between both concepts.

When we discuss entrepreneurial climate and culture at universities, we could say that entrepreneurial culture exists when university members act in an entrepreneurial fashion. This manifests itself in the visible artifacts, values and basic assumptions held by the members of universities. The pattern of basic assumptions results in observable behavior of employees and visible artifacts, which the members of the organization can see. As a result, this would constitute the entrepreneurial climate.

Since academic entrepreneurship is a relatively new phenomenon in Europe, it is likely that a broad entrepreneurial culture across universities does not yet exist (Etzkowitz and Klofsten 2005). Thus, analysing variables associated with entrepreneurial climate would lead to a better understanding of factors which shape entrepreneurial behavior. This in turn might contribute to the creation of entrepreneurial values and fundamental assumptions required for the sustainable development of entrepreneurial culture at universities (Schneider 2000).

Potential Factors Influencing Entrepreneurial Climate

In reviewing the literature, we noticed that previous research concerning academic entrepreneurship mostly concentrates on tangible factors, such

as incentive and reward systems for faculty and inventors or universities' royalty regulations (Friedman and Silberman 2003; Henrekson and Rosenberg 2001; Lockett and Wright 2005; Markman et al. 2004; Siegel et al. 2003), expenditure by universities on R&D (Coupé 2003) and appropriate infrastructure, like incubators or technology transfer offices (Lockett and Wright 2005; Moray and Clarysse 2005; Siegel et al. 2003). Covering intangible factors, most studies focus on university policies and their impact on spin-off formation (Degroof and Roberts 2004; Di Gregorio and Shane 2003; Power and McDougall 2005; Roberts and Malone 1996). To extend prior literature, we primarily focus on intangible factors besides university policies which might influence the entrepreneurial climate. Prior research mainly neglected this perspective. Furthermore, we concentrate on how factors could be influenced by a university's management without overstressing financial resources. Consequently, we exclude financial incentives and royalties from the study.

Although the climate perspective is a new view on academic entrepreneurship, there are different approaches in the literature that deal with the general and academic spin-off creation process. They provide evidence for factors potentially influencing the entrepreneurial climate at universities. These research streams include corporate entrepreneurship (Hornsby et al. 1999), entrepreneurial environments (Gnyawali and Fogel 1994), entrepreneurial university (Etzkowitz and Klofsten 2005) and academic spin-offs (Di Gregorio and Shane 2003; Grandi and Grimaldi 2005). We will now introduce the factors that potentially impact on a university's entrepreneurial climate.

It is important to mention that in most cases entrepreneurship is not seen as a main goal of universities when referring to academic entrepreneurship. Their traditional goals could be summarized as facilitating research and disseminating knowledge across academic and student communities (O'Shea et al. 2005). During the last decades, fostering the technology transfer process was attributed to them as a third mission in order to overcome limitations in economic development (Degroof and Roberts 2004; Niosi 2006). Hence, an ideal type of new university was developed – the entrepreneurial university. However, until now, this third mission of universities is not clearly implemented everywhere (Etzkowitz and Klofsten 2005). Therefore, it could be argued that the clear perception of *entrepreneurship as a university's goal* and as part of its mission is a key factor in perceiving a university as entrepreneurial and in fostering its entrepreneurial climate (Etzkowitz and Klofsten 2005; Friedman and Silberman 2003; Jacob et al. 2003; Laukkanen 2003; del Palacio Aguirre et al. 2006).

Furthermore, research indicates that the presence of experienced

entrepreneurs acting as successful *role models* is an important factor that influences entrepreneurial activities (Gnyawali and Fogel 1994; Laukkanen 2003; Moray and Clarysse 2005). When we consider the socio-economic condition, we could mention an additional factor that might influence the perception of the entrepreneurial climate, namely, the attitude towards entrepreneurship within the social system. It helps the backing of academic entrepreneurial activities and provides *social support* for entrepreneurs. If university members perceive a positive attitude towards entrepreneurship from their colleagues and management, it is likely that they perceive the university as being more entrepreneurial (Gnyawali and Fogel 1994; Laukkanen 2003; Moray and Clarysse 2005; O'Shea et al. 2005).

When we look at the factors that enhance the awareness of entrepreneurship and entrepreneurial opportunities within the university, we could add non-financial assistance. In particular, this includes the *infrastructure*, such as offices or laboratories offered by the university to academic entrepreneurs (Etzkowitz and Klofsten 2005; Di Gregorio and Shane 2003; Gnyawali and Fogel 1994; Jacob et al. 2003; O'Shea et al. 2005).

Furthermore, *entrepreneurial qualification programs* symbolize the institutionalization of entrepreneurial activities. Such institutionalization might have a positive impact on entrepreneurial climate (Burg van et al. 2008; Etzkowitz and Klofsten 2005; Laukkanen 2003; Moray and Clarysse 2005; del Palacio Aguirre et al. 2006).

Finally, the perceived *exposure to entrepreneurship* within the university in the sense of the frequency of contact with the topic could enhance the awareness of academic entrepreneurship and its perception, thus influencing entrepreneurial climate. This includes the university's official communications, for example, via campus magazines, newsletters or the university homepage, as well as informal communication within the university's daily life, for example, social interaction among university members (Burg van et al. 2008; Klein et al. 2001; Moray and Clarysse 2005; Morgeson and Hofmann 1999).

Considering the factors previously mentioned, we could assume that different factors influence the goal perception. They also symbolize the university's effort to implement its mission and goals into its structures and routines and make the mission more visible for university members (Etzkowitz and Klofsten 2005; Moray and Clarysse 2005).

Summarizing, we assume that the following factors might influence either directly or indirectly a university's entrepreneurial climate (see Figure 2.1): the perception of entrepreneurship as a university's goal (goal), the perception of successful role models (role model), the perception of entrepreneurial qualification programs, the perceived exposure to

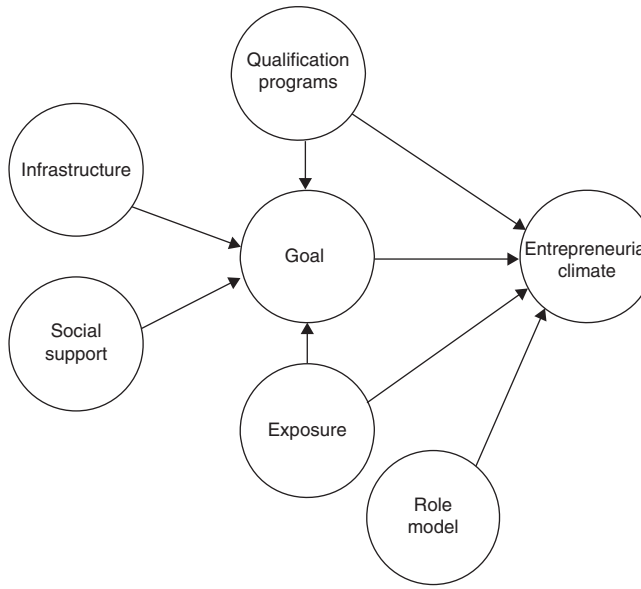


Figure 2.1 Conceptual model

academic entrepreneurship (exposure), the perception of infrastructure and the perception of social support.

EMPIRICAL STUDY

We collected data for this study through a survey at three German universities. Standardized online and paper questionnaires were distributed at the universities. To cater for the different groups of university members we divided them into two groups – students and faculty members. In total, 512 students and 190 faculty members returned the standardized questionnaires. Respondents rated all measures on seven-point Likert-type scales (1 = 'totally agree' and 7 = 'totally disagree').

The perception of entrepreneurship as a university's goal was measured with three indicators (for example, 'The stimulation of new business start-ups is a goal of my university'), the perception of entrepreneurial qualification programs with two indicators (for example, 'There are a lot of programs for entrepreneurial education and further education at the university'). The perceived exposure to academic entrepreneurship contained three indicators (for example, 'One comes often into contact

with entrepreneurship at my university'), the perception of successful role models one indicator ('There were successful spin-offs during the last three years at my university'). Infrastructure was assessed using five indicators (for example, 'To what extent could students or faculty members use offices for setting-up their businesses at your university?') and the perception of social support with two indicators (for example, 'If you became an entrepreneur, what would your colleagues think about you?'). Finally, entrepreneurial climate was measured with two indicators (for example, 'To my mind, my university is very entrepreneurship-friendly').

Due to the preliminary nature of our study and the lack of theoretical explanations in the field of entrepreneurship regarding the concept of climate, we chose partial least squares (PLS) structural equation modeling (Fornell and Bookstein 1982; Wold 1982) employing SmartPLS 2.0 (Ringle et al. 2005) to analyse the data and estimate the impact of the different factors.

As reported in Table 2.2 and Table 2.3 all measurement models – for both faculty and students – show values above the required thresholds regarding reliability, convergent and discriminant validity (Fornell and Larcker 1981; Hair et al. 2006). Therefore, we suggest that our measures are reliable and valid. Furthermore, a Q^2 value greater than zero in both samples indicates that there is predictive relevance within the structural relationships (Fornell and Cha 1994).

The structural model (see Figure 2.2) demonstrates the direct and indirect influences on entrepreneurial climate for both the faculty and student sample. All examined factors are meaningful with the exception of infrastructure in the faculty sample. For this group the results indicate that the perception of successful role models is most important for creating an entrepreneurial climate. Furthermore, the recognition of entrepreneurship as a university's goal and the general exposure to entrepreneurial topics are important as well. In contrast, the perception of entrepreneurship qualifications seems to have less impact on climate. Regarding the perception of entrepreneurship as a goal of the university and its management, the exposure to entrepreneurial topics plays a prominent role within the factors considered. Interestingly, how available facilities and infrastructure are perceived seems to be less important when it comes to goal perception, and unimportant regarding climate perception. Maybe this instrument targets people who are at a more advanced entrepreneurial stage when the decision to start a company is closer and the person's view is more open to competitive advantage or the possibility of cost reductions. In addition, social support (that is, a positive attitude towards entrepreneurship held by colleagues and professors) has no impact on the perception of the entrepreneurial climate and only a small impact on goal perception.

Table 2.2 Evaluation of the reflective measurement model for faculty (N = 190)

Construct	M	SD	Factor loadings (≥ 0.707)	CR (≥ 0.7)	AVE (≥ 0.5)	Fornell/Larcker (AVE > Corr²)[b]	R^2 (> 0.3)	Q^2 (> 0)
Goal				0.88	0.70	0.70 > 0.31	0.33	0.20
University	3.41	1.58	0.87					
School	4.27	1.68	0.91					
Professor	4.48	1.73	0.74					
Qualifications				0.87	0.77	0.77 > 0.37		
Quality	3.41	1.46	0.88					
Quantity	4.27	1.14	0.88					
Exposure				0.79	0.57	0.57 > 0.37		
General contact	3.41	1.60	0.85					
University's communication	4.27	1.65	0.83					
Contact at work	4.48	1.91	0.55					
Role model	2.67	1.36		1.00	1.00	1.00 > 0.25		
Infrastructure				0.92	0.70	0.70 > 0.01		
Offices	3.62	1.37	0.82					
Laboratory	3.46	1.29	0.89					
Equipment	3.68	1.30	0.90					
Production facilities	3.97	1.18	0.85					
Computer centre	3.08	1.23	0.70					

Social support				0.87	0.78	0.78 > 0.25		
Colleagues	2.81	1.37	0.78					
Professor	2.68	1.50	0.97					
Entrepreneurial climate				0.92	0.85	0.85 > 0.33	0.54	0.45
My university is very entrepreneurship-friendly	3.50	1.48	0.93					
There is a very good entrepreneurial climate at my university	3.99	1.35	0.92					

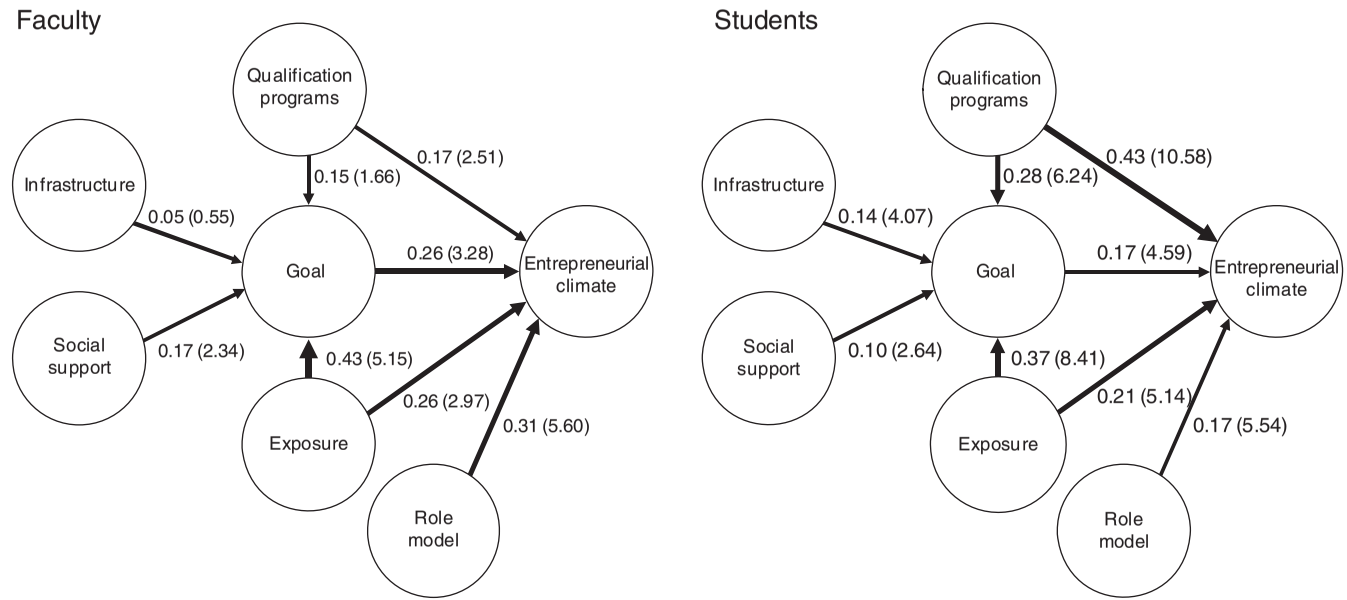
Note: M = mean, SD = standard derivation, CR = composite reliability, AVE = average variance extracted, $Corr^2$ = highest squared correlation between the model constructs, R^2 = coefficient of determination, Q^2 = predictive relevance (Stone-Geisser criterion).

Table 2.3 Evaluation of the reflective measurement model for students (N = 512)

Construct	M	SD	Factor loadings (≥ 0.707)	CR (≥ 0.7)	AVE (≥ 0.5)	Fornell/ Larcker (AVE > Corr²)[b]	R^2 (> 0.3)	Q^2 (> 0)
Goal				0.90	0.76	0.76 > 0.38	0.46	0.34
University	4.05	1.56	0.86					
School	4.41	1.73	0.92					
Professor	4.55	1.63	0.83					
Qualifications				0.90	0.81	0.81 > 0.51		
Quality	4.55	1.56	0.91					
Quantity	4.19	1.34	0.89					
Exposure				0.82	0.61	0.61 > 0.46		
General contact	4.39	1.67	0.86					
University's communication	4.91	1.63	0.78					
Contact at work	4.92	1.79	0.69					
Role model	2.78	1.05		1.00	1.00	1.00		
Infrastructure				0.91	0.68	0.68 > 0.11		
Offices	3.74	1.33	0.80					
Laboratory	3.49	1.19	0.86					
Equipment	3.71	1.16	0.84					
Production facilities	3.88	1.23	0.90					
Computer centre	2.83	1.23	0.72					

Social support				0.91	0.84	0.84 > 0.05		
Colleagues	2.68	1.05	0.90					
Professor	2.48	1.12	0.94					
Entrepreneurial climate				0.91	0.83	0.83 > 0.51	0.61	0.50
My university is very entrepreneurship-friendly	3.85	1.58	0.91					
There is a very good entrepreneurial climate at my university	4.23	1.38	0.91					

Note: M = mean, SD = standard derivation, CR = composite reliability, AVE = average variance extracted, $Corr^2$ = highest squared correlation between the model constructs, R^2 = coefficient of determination, Q^2 = predictive relevance (Stone-Geisser criterion).



Notes:
t-values are in parentheses.
Significant paths ($p < 0.05$) are printed in boldface.

Figure 2.2 Structural model with path coefficients (standardized values)

Table 2.4 Significance of path differences between faculty and students

Path	Faculty	Students	t statistics path differences
Qualification programs → climate	0.17	0.43	3.195**
Qualification programs → goal	0.15	0.28	1.443*
Exposure → climate	0.26	0.21	0.575
Exposure → goal	0.43	0.37	0.706
Goal → climate	0.26	0.17	1.195
Infrastructure → goal	0.05	0.14	1.103
Role model → climate	0.31	0.17	2.334**
Social support → goal	0.17	0.10	0.908

Note: * $p < 0.1$; ** $p < 0.01$.

We can identify several differences in the extent of the path coefficients when we compare faculty and students as shown in Figure 2.2. We used the following formula (Chin 2000) to calculate whether the differences between both samples are significant:

$$t = \frac{Path_{sample1} - Path_{sample2}}{\left[\sqrt{\frac{(m-1)^2}{(m+n-2)} * S.E._{sample1}^2 + \frac{(n-1)^2}{(m+n-2)} * S.E._{sample2}^2}\right] * \left[\sqrt{\frac{1}{m} + \frac{1}{n}}\right]} \quad [2.1]$$

with m being the cases in the faculty sample (190), n the cases in the students sample (512) and *S.E.* the standard error of the respective sample.

We identified significant differences regarding the impact of the perception of qualification on climate and goal perception and the impact of successful role models on climate perception (see Table 2.4) when we examined both groups.

For students, the perception of entrepreneurship qualification programs is the most important factor influencing the entrepreneurial climate at the university. The general contact with entrepreneurial topics within the university (exposure) seems to have nearly the same impact as for the faculty group. In contrast, goal perception and successful role models appear to play a minor role in influencing students' perception of the entrepreneurial climate at their university. Furthermore, the perception of available infrastructure for spin-offs and the perceived positive attitude towards entrepreneurial activities by members of faculty do not directly influence climate perception. Both factors affect the goal perception, which in turn

has little impact on climate. Qualification programs and exposure could be added as potential factors when considering the perception of entrepreneurship as a university's goal. Across the groups, it turns out that a general exposure to entrepreneurship (for example, covering successful start-ups by university media, presentations and discussions with entrepreneurs) is a major determinant in the perception that fostering academic spin-offs is a university goal.

DISCUSSION AND IMPLICATIONS

The purpose of this study was to examine how the perception of specific tools aiming to foster academic entrepreneurship (that is, qualification programs, infrastructure, exposure to entrepreneurial topics, fostering entrepreneurship as a goal of the university) and related entrepreneurial events or procedures (that is, social support, presence of role models) influences academics' evaluation of the conditions to start a new venture. We conceptualized the institutional conditions as a university's entrepreneurial climate. We expected that the analysed tools and events derived from literature significantly contribute to the university's entrepreneurial climate. Our empirical work tested this core proposition via a survey involving 702 academics. In order to capture all university members and enhance generalizability, we included both students and faculty in the study.

Overall, entrepreneurial climate was directly influenced by the analysed factors in the proposed way. Interestingly, important differences between faculty and students came to light. In line with the work of del Palacio Aguirre et al. (2006), our results showed that qualification programs are most important for shaping students' entrepreneurial climate but least important for faculty members. For the latter, the presence of role models leads to significantly better climate perceptions, relative to students.

An unexpected finding occurred regarding the perception of infrastructure available for academic entrepreneurs. Although there is consensus that infrastructure is important for supporting spin-off creation (Di Gregorio and Shane 2003; Jacob et al. 2003; O'Shea et al. 2005), we did not find significant effects on faculty members' perception of entrepreneurship as a university goal. For students, this link exists but is weak. Reasons for this could be that academics are unaware of existing infrastructure or that university management failed to visibly integrate these structures (Jacob et al. 2003).

In conclusion, the successful introduction of the climate construct allowed us to combine the internal perspective of potential entrepreneurs

with their specific university environment. Academics' perceptions of structural elements constitute the starting point for internal psychological processes related to entrepreneurial decision-making. The climate concept is able to capture a broad range of factors regarding the evaluation of the entrepreneurial environment. Moreover, it includes differences in the relevance of single factors for students and faculty. Thus, entrepreneurial climate might be a powerful variable in explaining entrepreneurial behavior. More importantly, it may even help to explain its absence.

In addition to these implications for entrepreneurship research, our results provide important practical implications. There are new ways in which universities can improve their entrepreneurial climate in a strategic manner. First, university management should increase the visibility of existing efforts to foster academic entrepreneurship. In this light, there is a need to consider perceptual differences between students and faculty. Thus, in order to increase entrepreneurial climate within each group, communication channels and tools should be carefully selected. Respectively, media and tools frequently used by students may emphasize information about entrepreneurial qualification programs. In so doing, the university–entrepreneurship link might be created or enhanced among students, even among those yet unaware of such offers. In contrast, specific communication channels qualified to achieve faculty members' attention may highlight successful academic entrepreneurs to increase role-model perception (for example, using professors and colleagues as multipliers, newsletters of the schools). Second, the impact of tools that foster academic entrepreneurship could be improved. If a university tried to establish a strong entrepreneurial climate, it should include this as a part of the overall university mission and explicitly inform all university members. This in turn contributes to the perceived exposure to entrepreneurship and, therefore, might increase both goal and climate perception. Furthermore, if the university establishes qualification programs, it will be reasonable to avoid solely focusing on people who are already interested in entrepreneurial topics. Because these programs are the most powerful driver in establishing an entrepreneurial climate for students, it seems worthwhile to include such programs in as many curricula as possible. Thereby, university management might consider particular needs of students to lower initial barriers. With respect to role models, universities might search for recent entrepreneurs with an academic background to demonstrate that this topic is a viable career option. In addition, university management could actively support nascent entrepreneurs who seem to be suitable as successful and authentic role models.

Despite the insights from this study, further research is needed to examine the relationships between entrepreneurial climate and other

important psychological concepts, as attitude toward entrepreneurship or intention to start a new business. Additionally, future research may combine the climate approach with objective indicators of academic entrepreneurship like universities' spin-off rates. This might contribute to our understanding of the effectiveness of different tools and events that have been introduced to foster academic entrepreneurship.

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3. Overcoming critical junctures in spin-off companies from non-elite universities: evidence from Catalonia

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INTRODUCTION

The rapid rate of technological change, shorter product life cycles and more intense global competition has radically transformed the current competitive position of many regional economies (O'Shea, 2007, p. 170). A growing policy debate has led governments to increase pressure to develop regional innovation systems. In this respect, policy-makers have recently emphasized the role of universities as agents of knowledge and technology transfer from research institutions to the markets. Universities have been demonstrated as a potential tool for technology/knowledge creation and development. Several authors have stressed the importance of universities and other research institutions in regional economic development through the commercialization of research and through spin-off creation (Dubini 1989; Clayman and Holbrook 2004; Hindle and Yencken 2004; Lowe 2002).

In recent years, university spin-off companies (USOs) have become one of the ways of commercially exploiting potentially valuable research. In this respect, Henry Etzkowitz (1998, 2003) has developed a general model to understand the interactions between universities, government and the industries. However, understanding the USO phenomena remains limited. Therefore, greater knowledge of this particular entrepreneurial process and of the resulting companies is needed.

In the literature, several authors have stressed the benefits of academic spin-offs. They contribute to regional economic development (Lowe 2002), they generate significant economic value and create jobs (Cohen 2000) and they enhance the commercialization of university technologies, especially

those that are uncertain (Thursby et al. 2001). Furthermore, USOs have a greater survival rate compared to other technology-based firms (Serarols et al. 2008; Shane 2004). Some university spin-offs have a high growth rate and in some cases they become public companies (Clarysse et al. 2005; Shane 2004). However, university spin-offs are a complex phenomenon and analysis from different perspectives – academic, practitioner and policy maker – is far from being systematic.

Many publications have described the spin-off phenomenon and the entrepreneurial transformation of public research institutions. However, this body of research has mainly focused on universities labelled as elite, eminent, successful, entrepreneurial or high performing, although no explicit definitions or characterization of these terms is provided (Acworth 2008; Carayol and Matt 2004; Debackere and Veugelers 2005; Jacob et al. 2003). We understand the importance of these successful cases as possible role models for other universities, but in order to have a holistic view of the phenomenon, the literature seems to have neglected many other initiatives performed by more humble, non-elite universities. In this sense, Wright et al. (2008) argue the necessity of complementing cases' characteristics in highly developed environments with their counterparts in less developed environments. These authors wonder how relevant are the insights obtained from the more developed contexts to environments where there is less demand for innovation, where a world-class research base is lacking. As stated in Wright et al. (2008), if universities have demonstrated an impact on their regional/industrial environment they should be regarded, described and framed in their context. However, few works deal with such a complementary but necessary process.

Based on three theoretical frameworks (resource-based view, institutional theory and stage-based models of venture development), the aim of this chapter is to shed some light on the process of non-elite university spin-offs creation and development. Following this general purpose, the objective is to explore the process by which non-elite USOs overcome critical junctures in their development. In addition, we want to compare our results with studies from elite USOs using Vohora et al.'s (2004) stage-based model of venture creation and development. For this purpose we conduct an exploratory qualitative study with 11 spin-offs companies created in Catalonia (Spain) from the Autonomous University of Barcelona (UAB) and the University of Girona (UdG). In the next section we review previous studies related to the process of university spin-offs creation and development. In the third section we present our research design and data collection process. In the fourth section we present the results obtained and their discussion. Finally we conclude and present some of the limitations and implications of the study.

PREVIOUS STUDIES

Mustar et al. (2006) reviewed the literature on research-based spin-offs and developed a conceptual framework based on three streams of research: the resource-based view, the business model perspective and the institutional perspective. Our approach is consistent with the suggestions made in Mustar et al. (2006) that for a better understanding of the heterogeneity of USOs, we should examine how firms develop over time in terms of their resource endowment, strategies and links with the parent research institution (PRI). As firms evolve, their resources will change and they may develop a different business model.

The stage-based literature focuses on how new ventures develop over time, and identifies the changes required if a new venture is to continue to progress to the next stage of development. We also consider the factors and resources influencing the USO creation and development process. For this purpose, we review the literature about the resource-based view (RBV) of the firm, which considers the resources of the firm as a predictor of competitive advantage and growth. We also examine the institutional theory (IT) framework to look for factors that may influence the growth path of non-elite USOs. Finally, we summarize what are the resources and factors that help to overcome the critical junctures of USOs.

Process of New Venture Creation and Development: Stage-based Models

There is little empirical evidence that either validates or fails to validate stage-based models, which represent a long tradition in studying the process of new firm development. It stems from the assumption of a linear, unitary process, composed of a set of activities, beginning with the recognition of a business opportunity and culminating with the first sale (Kazanjian and Drazin 1990; Liao et al. 2005; Shane and Venkataraman 2000; Webster 1976). We call these models, stage-based models of firm development.

Although there is no single, generally accepted stage-based model, all emphasize that the nature of a business changes as it grows (Clarysse et al. 2005). In fact, the evidence in such models has shown the role of feedback and the potential for non-linear development of firms. The process is itself complex, interactive and requiring some trial and error. In this study, we do not aim at developing a new USO creation model, but rather use existing models to identify the main resources and strategies in the different phases of USO development.

The university spin-off based literature offers several models of venture creation (Clarysse and Moray 2004; Clarysse et al. 2005; Degroof 2002;

Hindle and Yencken 2004; Lockett et al. 2005; Moray and Clarysse 2005; Ndonzuau et al. 2002; Roberts and Malone 1996; Vohora et al. 2004). For example, Lockett et al. (2005) identified five main stages that developed iteratively: research, opportunity, pre-organization, reorientation and sustainable. Another example is Clarysse and Moray (2004) that identified the following steps: idea, pre-start-up, start-up and post-start-up or opportunity recognition. It is important to notice that these models vary from one author to another, stressing the step they consider most important. However, there are common features that enable one to find a core process.

In order to develop an understanding of the process of university spin-off creation and development it is important to identify not only the stages of growth but also the obstacles that firms have to overcome during their development. In this sense, Vohora's et al. model (2004) is the only one that particularly identifies transition stages or *critical junctures*. Critical junctures are defined as the difficulties that the USO has to overcome in order to pass from one phase of development to the following one. They arise because the venture requires new configurations of resources, capabilities, network ties and support from institutions. Four key critical junctures have been identified in Vohora et al. (2004):

- *Opportunity recognition*. It is the ability to synthesize scientific knowledge with an understanding of markets that is enhanced significantly by higher levels of social capital in the form of partnerships, linkages and other network interactions.
- *Entrepreneurial commitment*. It arises due to the conflict between the need for a committed venture champion to develop the USO venture and the inability to find an individual with the necessary entrepreneurial capabilities (Vohora et al. 2004, p. 163).
- *Threshold of credibility*. This critical juncture arises due to the entrepreneur's inability to gain access to and acquire an initial stock of resources, which are required for the business to begin to function (Vohora et al. 2004, p. 164).
- *Threshold of sustainability*. It may take the form of revenues from customers, milestone payments from collaborative agreements or investment from existing or new investors.

Factors and Resources Influencing the USO Creation and Development Process

The resource-based approach is particularly helpful in shedding light on the factors contributing to the nature and outcome of a spin-off arrangement (Parhankangas and Arenius 2003, p. 465). The RBV brings valuable

evidence in terms of required resources to move from one stage to another. For example, Vohora et al. (2004) stressed the different resource base of the spin-off according to its development phase and the critical junctions it had to overcome.

We have reviewed most of the literature[1] related to the process of spinning-off ventures that have applied the resource-based and resource-based dependence views. Following Brush et al. (2001) we have identified six critical dimensions of resources: organizational (Franklin et al. 2001; Lockett and Wright 2005), networking (Lindelöf and Löfsten 2004; Nicolaou and Birley 2003), financial (Fontes 2001; Shane and Stuart 2002), physical (Carayannis et al. 1998; Westhead and Storey 1995), technological (Autio and Lumme 1998; Pérez and Martínez 2003) and human resources (Pirnay et al. 2003; Walter et al. 2005).

However resources are highly context dependent. Under these circumstances, the institutional framework impacts on the amount and variety of resources available. Recent work on the heterogeneity of research-based spin-offs (Mustar et al. 2006) describes the institutional perspective of research-based scientific organizations as the relationship with, and the embeddedness within, their parent organizations, which have their own cultures, incentive systems, rules and procedures. We have reviewed the main studies[2] related to the institutional perspective and identified research on formal factors (Debackere and Veugelers 2005; Fontes 2001, 2005), informal factors (Ferguson and Olofsson 2004; Mok 2005), and combined factors (Autio and Yli-Renko 1998; Siegel et al. 2003).

It is important to mention that the knowledge based view (KBV) of the firm could be an alternative framework to understand the process of USO development. The KBV emphasizes the key role of knowledge in the development of technology-based firms. Thus, in the KBV framework the creation, development and transfer of knowledge are the main sources of competitive advantage for firms. We have to acknowledge that this approach, even though is partly included in the RBV,[3] exceeds the scope of the current research.

Resources and Factors Needed to Overcome USO Critical Junctures

In Table 3.1, we present the key resources and institutional factors influencing the overcoming of critical junctures in the development of USOs. We observe that USOs will have a higher probability of recognizing a business opportunity from their research results if their founders' teams have a good knowledge of the target market and contacts with potential partners, distributors and other key players in the industry. It is also easier for the founders to recognize an opportunity when the USO presents a patented

Table 3.1 Resources and factors affecting critical junctures overcoming by USOs

Opportunity recognition	Entrepreneurial commitment	Credibility threshold	Sustainability threshold
Breakthrough technological innovation	Breakthrough technological innovation	Breakthrough technological innovation	Technological flexibility
Patents	Patents	Patents	Portfolio of different technologies and commercial applications
Founders' background, market knowledge and industry contacts	Founders' social capital: industry contacts and successful role models of academic entrepreneurs	Founders' and CEOs' market knowledge and industry contacts	Founders' and CEOs' market knowledge and industry contacts
Applied or basic research	Founders' managerial experience and industry/market knowledge	Complete, capable and well-balanced management team	CEOs' previous business experience and managerial capabilities
Industry sponsor	Founders' link with parent university	Eminence of the founders' team	University support to find new clients and investors
University support and entrepreneurial mentality	University support and policies about IP and spin-off creation by academics	University support and prestige in the USO's field of research	Organizational resources: commercial actions, managerial routines, strategic planning, etc.
Feasibility or market study	Financial resources and sales forecasts of the new venture	Industrial partners and financial back-up	

technological innovation that represents a breakthrough. Moreover, academic founders have a better chance to recognize a business opportunity if their research is market-oriented instead of basic research. The support and motivation given by the parent university may also be an important factor to overcome this critical juncture.

In order to attract a capable and experienced venture champion, the USO

needs to have a substantial volume of sales perspective and has to offer an attractive compensation package or IP to the surrogate entrepreneur. The personal contacts of the founders' team could also help to identify and hire an experienced surrogate entrepreneur. Finally, the founders' link with the parent university and the latter's policies on academic spin-off creation will also influence how the entrepreneurial commitment juncture is overcome.

The market knowledge and industry contacts of the founders and chief executive officer (CEO) are essential for the USO to gain market credibility. To gain credibility from external investors, it is better to have patents or other type of IP protection mechanism. Having a good management team with complementary capabilities is also a valuable resource for the USO to gain investors' credibility. The support of the parent university and its prestige in the USO's field of research is also an important factor when the USO wants to penetrate markets and reach first sales.

Overcoming the sustainability threshold largely depends on the size and flexibility of the technological portfolio of the USO. A flexible structure and business model will also facilitate the process of overcoming this critical juncture. Finally, founders' and CEO's industry contacts and the support of the parent university to find new clients will increase the chances to reach sustainable returns.

RESEARCH DESIGN

Defining Elite Universities

Vohora et al. (2004) considered research income as a measurement of research elite universities in the UK, although other authors are more publication oriented. For example, the most well-known ranking for universities worldwide is that one elaborated by the University of Jiao Tong from Shanghai (China). This ranking, also known as the Academic Ranking of World Universities (ARWU), classifies the best 500 universities around the world based on Nobel laureates, field medals, highly cited researchers and papers published in nature and science indexes, among others. In addition, they scanned major universities of every country with significant amounts of articles indexed in recognized citation indexes (Liu and Cheng 2005).

The majority of manuscripts describing the spin-off phenomenon and the entrepreneurial transformation of a public research institution have focused on universities labelled as productive, effective, excellent, elite, top-ranked or unique, which are included in the ARWU top 500. Most of the cases studied belonged to universities ranked in the first quartile of those indexes. However, the universities chosen for the purpose of

Table 3.2 Comparing UAB, UdG and MIT (year 2007)

Variables	UAB	UdG	MIT
No. of research institutes*	0.65	0.82	3.40
No. of spin-offs*	0.65	1.03	7.86
Annual research expenditure**	€15 237	€11 113	US$351 115

Notes:
* Per hundred academics.
** Per total number of academics.

Source: Research reports of UAB and UdG, and MIT web page.

this study belong to last quartile, or do not even appear in the ranking. According to the ARWU, the UAB is classified in the position 300–400 and the UdG does not even appear in this ranking.

There are also other rankings but far less used than ARWU. For example, the Webometrics[4] Ranking of World Universities is an initiative of the Cybermetrics Lab, which is a research group belonging to the Consejo Superior de Investigaciones Científicas (CSIC), the largest public research institute in Spain. This ranking was first published in 2004 and includes over 16 000 higher education institutions worldwide. It classifies them according to their web presence (size of the web, visibility, web size, rich files and Google Scholar), which is considered as a good indicator of the impact, prestige and visibility of these institutions.

In Table 3.2, we have standardized research figures for UAB, UdG and the Massachusetts Institute of Technology (MIT) considering the size of the university under analysis. We observe remarkable differences between UAB, UdG and MIT in terms of spin-offs created, the number of research institutes and total research expenditure divided by the total number of academics. With 1704 academics working at MIT in 2007, it produces 12 times more spin-offs than UAB and almost eight times more than the UdG. The MIT's research expenditure by academic is around 20 times bigger than that of the UAB or the UdG.

According to the above figures, we can consider UAB and UdG as non-elite universities in terms of research eminence and spin-offs activity, and according to ARWU.

The Regional Environment for Non-elite Universities: UAB and UdG

The region hosting the universities and spin-offs analysed in this chapter is Catalonia, a region with an area of 32 000 square kilometres and a

population of 7 million people. The regional government is competent in designing technology policy, innovation system and research plans for the region. In fact, the functioning of a 'Comunitat Autònoma' in Spain is similar to that of a state (USA) or a Land (Germany).

The main distinctive characteristic of the regional research and development (R&D) system of Catalonia is its level of resources, which are above the Spanish average, although still far from other scientific regions/countries of excellence (Serarols et al. 2008). In 2003, Catalonia spent 1.38 per cent of its gross domestic product (GDP) in R&D activities and had 6.42 researchers per every 1000 inhabitants. The business sector represents the backbone of its innovation system with 67 per cent of the total expenditure. Furthermore, with only one-sixth of the Spanish population, Catalonia generates more than one-third of its high-technology exports (34.6 per cent) and almost a quarter of the R&D expenditure (22.84 per cent), as well as a quarter of the industrial GDP (25.52 per cent) (Serarols et al. 2008).

The Technological Trampolines (TTs), founded by CIDEM in late 2000, are business formation support institutions for promoting technology-based and knowledge-based spin-offs from academia. Their main mission is to detect, select, evaluate and give advice to new spin-off projects. Generally, a Technological Trampoline is a public independent entity integrated in a Technology Transfer Office (TTO) from a public university. Although the TT is linked to the TTO in terms of office space and other physical resources, its functioning and budget are independent from both the university and the TTO. The CIDEM is exclusively funding the TT, however, spaces and other physical resources are usually provided free by the university. Both universities under study, UAB and UdG, have a TT supporting spin-off creation. While UAB is a big university with approximately 40 000 students and attracts academics and students from all over the world, the UdG is a medium-small university with regional scope and approximately 14 000 students (see Table 3.3).

Data Collection and Cases under Study

An exploratory, qualitative research methodology was adopted to obtain greater knowledge of the process by which university entrepreneurs create and develop their ventures. Via a multiple case study analysis we provide an in-depth exploration of each spin-off and give rich insights about the entrepreneurial process followed by USOs. In performing this study we followed procedures commonly recommended for conducting case study research (Eisenhardt 1989; Yin 1989). Our main unit of analysis is the spin-off that has the support of the parent university. This database was

Table 3.3 General information of the UAB and UdG

Variables	UAB	UdG
Faculties	15	18
Departments	54	20
Research groups	154	100
Research institutes	25	8
Scientific and technological park	Yes	Yes
Electronic bulletin on research	Yes (monthly)	Yes (monthly)
Spin-offs	25	10
Academics	3813	970
Bachelor degrees	78	21
Bachelor degrees with entrepreneurship subjects	2	1
Master degrees	169	25
Master degrees with entrepreneurship subjects	4	2
PhD programmes	85	17
Postgraduate and PhD students	11 044	2417
Number of R&D contracts	481	164
Incomes generated R&D contracts	€17 700 000	€3 020 000
External research funds	€51 140 000	€9 570 000
Internal research funds	€6 960 000	€1 210 000

Source: Research Annual Reports of UAB and UdG 2007.

composed of 35 companies (25 from UAB and ten from UdG), of which 11 agreed to take part in the research (seven from UAB and four from UdG).

Over a year period, from February 2008 to February 2009, a series of semi-structured interviews was held among the academic entrepreneurs (Rubin and Rubin 1995). These interviews were held on the site of businesses and we conducted follow-up interviews and telephone calls to clarify issues. For each interview we tape-recorded the conversation. In a qualitative case study research, corroboration of interviews through the use of archival records is important to validate information (Yin 1989). Therefore, the interview data were supported with information from other sources such as business plans, balance sheets, accounts and commercial brochures.

For reliability purposes a case study protocol was established to ensure that the data collection was focused on how entrepreneurs overcome each critical juncture identified in the literature, verified that the same information was being collected for all the cases and aided in the data analysis.

Validity was established by using multiple sources of evidence (triangulation), by transcribing and checking the interviews with the interviewees and having key informants review drafts of the final report. To avoid confirmatory biases, one of the authors was kept at a distance from the field observations and focused on conceptualization and analysis of the interpretations developed by other researchers (Vohora et al. 2004).

In Table 3A.1 in the Appendix, we can see the main characteristics of the spin-offs under study. All are new firms, not yet consolidated in their markets. Thus, these firms are still in the process of development. Four are in the biotechnology industry, three in the information technology (IT) sector and two in the content sector and two in electronics.

RESULTS AND DISCUSSION

In the following subsections, we highlight the key resources, capabilities and institutional factors that were determinants for our set of USO to overcome each of the critical junctures during their development process.

Opportunity Recognition

From our data, we observe that the founding team of Hexascreen, Univet, X-ray Imatek, Aqsense and Sisltech recognized business opportunities because they had some knowledge of the target market and were therefore involved in applied research with the industry, very close to markets' needs. In Univet and Sisltech, their research was sponsored by an industrial partner willing to develop a product, which played a key role in the opportunity recognition process by guiding the research group (the founder team) towards a technically and commercially feasible product/service suited to fulfil a concrete market need.

In Ab-biotics, X-ray Imatek, Aqsense, Microbial and Sisltech, the support of the Technological Trampoline of the parent university was essential in recognizing the business opportunity. The TT helped the founders to overcome this critical juncture in at least three ways: (1) guiding and motivating academics to commercialize their research (X-ray Imatek and Aqsense); (2) financing or directly evaluating the commercial feasibility of their research results (Ab-biotics and Microbial) and (3) finding industrial sponsors (Sisltech). The founder and CEO of Microbial explained: 'It was the university TT that evaluated the commercial applicability of the research I was involved in. The TT made a market study and concluded that the technology we were developing had a great commercial potential.'

The firms that were not involved in research projects at a university (Patatabrava and Ecomunicat), the firms that were not based in any breakthrough technology (EAP) and the firms founded by non-academics (Davantis) did not receive the same level of support from the parent university TT. The founders of Hexascreen and X-ray Imatek identified their business opportunities by benchmarking their research results in congresses, conferences and workshops. Furthermore, one of the founders of Davantis said: 'we knew we've got something good on our hands when we ended up in third position at the 2003 annual entrepreneurship contest in INSEAD.'[5] One of the founders of EAP recognized the opportunity when during a research stay in a German university, a group of students had created a similar company with great success.

Finally the founders of Ecomunicat and Patatabrava did not recognize a concrete business opportunity but they were confident about their ideas and personal skills. Ecomunicat's founder said: 'we were committed to the business without having recognised any particular opportunity. We were just confident of our technical capacity and we knew this business would work some way or another'. This result differs from Vohora's et al. (2004) findings in the sense that every elite USO appeared to recognize a business opportunity before starting the project.

Our data show that non-elite USO do not possess the same level of intellectual capital as spin-offs emerged from eminent universities. Only Microbial and X-ray Imatek had patents protecting their technology. This patented technology was an important factor for Microbial and X-ray Imatek to draw the attention of the TT and investors. Therefore, non-elite USOs will have greater difficulties in recognizing a business opportunity compared to elite USOs because they present a lower potential for IP protection of the research done at the parent university.

Entrepreneurial Commitment

At this critical juncture, the firm has to find the venture champion, with the necessary entrepreneurial capabilities who can make a solid commitment to developing the company into an established one. From the data, only Aqsense had the ability to hire an external venture champion with managerial experience. Aqsense hired a surrogate entrepreneur with the help of the TT's network of contacts. In the rest of the cases, one of the founders or the whole founding team took such a responsibility with no previous managerial experience and very few (or no) industry contacts (Ab-biotics, Ecomunicat, X-ray Imatek and Microbial).

We have identified three reasons that prevent non-elite USO from hiring an experienced manager coming from the industry. First, the

lack of economic resources to attract the right venture champion by offering a salary and incentive package according to his or her merits (Ab-biotics, Davantis, Patatabrava and Microbial). Second, the scarce social (industry) capital of the founding teams (most with only academic background), which limited them when identifying suitable managers from their network of contacts (Aqsense and X-ray Imatek). Third, the USO's general perspectives of low sales volume for the following years dissuade potential surrogate entrepreneurs from joining the USO as CEOs (Sisltech).

Moreover Ab-biotics' and X-ray Imatek's academic founders committed as full-time CEO of the new venture and had to leave his or her academic position at the parent university. The academic founder of Microbial combined her full-time CEO position with teaching part-time in academia. In Sisltech, the academic founder joined the company as part-time CEO while keeping his academic position at the university.

We have also identified a key player for the non-elite USO in order to overcome this critical juncture: the doctoral fellow student.[6] The full-time venture champion position was taken by a doctoral fellow student in Hexascreen, Univet and EAP. In these cases, the academic founders proposed the fellow students as CEOs of the firms because their scholarships were reaching an end.

Our non-elite university spin-offs do not generally hire an external manager to run the business, which clearly differs from Vohora's et al. (2004) findings. Consequently, the CEO position and the role of venture champion in non-elite USOs is generally assumed by one of the academic founders, who usually has little industry and managerial experience. This is especially the case for Hexascreen, Univet and EAP, where a doctoral student assumed the CEO position in the company. This 'cheap' way of overcoming entrepreneurial commitment by non-elite USOs may have negative effects on future critical junctures. For example, an inexperienced manager without industry contacts will have great difficulty gaining credibility in the markets and with potential investors.

In addition, we observe that some of the academic founders of non-elite USOs were more willing to assume the CEO position and thus leave their academic position in comparison to Vohora's et al. (2004) results. As Ecomunicat's founder said: 'I liked the idea of becoming a business manager. This was totally new for me and I was motivated to do it properly.' It seems that non-elite USO founders are more likely to tolerate risk and face uncertainty than academic founders from eminent universities. This could also be explained by the fact that the opportunity cost of leaving his or her professor position is higher for elite universities' academics than for non-elite ones.

Credibility Threshold

Credibility is one of the major problems that start-ups face. These new ventures lack brand awareness, commercial experience and other capabilities that constrain the entrepreneur's ability to access and acquire key resources: seed finance and human capital to form the entrepreneurial team. From our data, X-ray Imatek and Aqsense are still trying to overcome this juncture. X-ray Imatek is unable to gain market credibility because they cannot reach an industrial partner willing to develop and manufacture a digital mammography machine based on its sensor. As X-ray Imatek CEO said: 'We have already developed a high performing sensor for digital mammography; which is much better than what you can find in the market. But our potential clients [mainly hospitals] are just interested in buying a completely finished digital mammography machine, key at hand!'

In the case of Aqsense, the surrogate entrepreneur lacked the industry-market knowledge and the social capital necessary to get first sales. As Aqsense's founder said: 'At present, we certainly lack the necessary industry contacts in order to reach our target market.' The rest of the USOs had overcome this juncture mainly by adapting their technology, products or services to the specific needs of their clients. For example, Sisltech had to change its business model and became a service-oriented company that worked only under client orders. Ecomunicat had to completely expand and adapt its product portfolio to their clients' needs. Ecomunicat also benefited from a low-cost strategy to gain market credibility and reach first sales. Ab-biotics, Hexascreen and Microbial emphasized the importance of working closely with their potential clients. Ab-biotics was constantly performing demonstrations of their products and services at their clients' sites. Microbial frequently organized courses and seminars to show their technology to potential clients. For Hexascreen and Univet a way of gaining credibility in the market was to offer free product trials to clients.

In our non-elite university context most of the spin-offs do not have any particular IP protection mechanism; only X-ray Imatek and Microbial had patented technologies. Patents are intellectual valuable assets for the USO; therefore, the lack of them could explain the difficulty to get external funding. This was the case of Sisltech: 'We have developed a good technology but we couldn't patent it because it wasn't innovative enough. We wrote down a notary act describing our technology and know-how but it didn't have the same effect on potential investors compared to a patent.' On the contrary, Microbial's CEO got seed capital thanks to their international patents. The CEO pointed out: 'With the approval of our

international patents, especially the one for EEUU, investors started to take a closer look at our company.'

The support of the TT is usually weak at this transition stage. In general, the TT does not have the industry contacts necessary to penetrate the markets (Patatabrava and Sisltech). On the other hand, Ab-biotics, Davantis and Ecomunicat made good use of the university's prestige/brand to gain technological credibility in the industry. As one of the founders of Davantis said: 'Being a university spin-off under the institutional umbrella of the UAB [the parent university], is usually seen as positive when you are discussing the technical advantages of the technology developed. It does not help to gain credibility with clients or with potential investors.' In the case of EAP, the institutional link with the parent university was crucial to gain market credibility. EAP's parent university became its first and most important client of the firm and gained market credibility.

In order to gain investors credibility, non-elite USOs often have to deal with the absence of patents or other kind of IP protection. Venture capitalists and private investors are willing to invest in USOs in return for some kind of value; therefore, having an IP protection is an asset well valued. As stated in Vohora et al. (2004, p. 165): 'The business angels and particularly the venture capitalists, consistently asked the same question of the entrepreneur. What is it I'm buying here? What am I getting for my money?'

As in the case of Vohora et al. (2004) our results show that the academic prestige of the university helps a firm to gain credibility among investors and also enhances the credibility of the technology developed. However, in terms of credibility with markets/customers this issue is not important. On the contrary, it can be seen as a liability due to the lack of commercial orientation of universities. In terms of Vohora et al. (2004, p. 166): 'External financiers and customers may be suspicious of the extent to which universities' non-commercial cultures may have an influence over the USO.'

Sustainability Threshold

Only Patatabrava and Univet overcame this critical juncture and reached sustainable returns. Patatabrava could sign long-term online advertising contracts with major clients of the industry due to their traffic in its web portal. They could maintain high traffic because they were constantly involved in the organization of social and leisure events promoted through their web portal. As one of Patatabrava's founders said: 'We have already gained the attention of the big fish of the industry [online advertising] but we must keep on doing everything to retain them as loyal clients. The key to doing so is securing a high amount of traffic on our web.'

Univet reached sustainable returns benefiting from the support of the

parent university. Univet is located in campus at the Faculty of Medicine, where they have access to university laboratories and other facilities, with continuous contact with doctors. All these allowed Univet to establish long-term agreements with international pharmaceutical companies for the development and commercialization of veterinary treatments for skin illnesses. The rest of the university spin-off companies in our study are still struggling to reach the phase of sustainable returns. Before that happens, they have to gain the ability to adapt their technology to market needs (Davantis and Ab-biotics) and to gain the capacity of reconfiguring their resources or acquiring new ones in order to develop new product lines and reach new clients (EAP, Hexascreen and Microbial). In Sisltech, the main factor preventing the USO from reaching sustainability is the small size of the target market. They are thinking of changing the business model again and totally abandoning product development to focus instead on consultancy services for the industry. Finally, Ecomunicat is on its way to sustainability by adapting its technology to clients' needs and increasing the list of products and services provided. They have also moved to a technological park very close to their clients and to major industry players.

Similar to Vohora et al. (2004), our data show that the USO's capacity to quickly reconfigure its resources, routines and structure in order to adapt to new clients' requirements, is the critical factor in overcoming this business development juncture and achieve sustainable returns. From our cases, Patatabrava and Univet had both the same impression as Optical from Vohora et al. (2004): 'As USO our mission was simple: to evolve and do it quickly'. Finally, in comparison with Vohora et al. (2004), non-elite USOs received little support from the TT to overcome the sustainability threshold.

CONCLUSIONS, LIMITATIONS AND IMPLICATIONS

Based on three streams of literature, we have identified the key necessary resources and institutional factors influencing the overcoming of critical junctures in the development of university spin-off companies. We have also compared our results with those in Vohora et al. (2004) in order to better understand the differences in the development process of spin-offs from non-elite universities versus those from elite universities. Our results show that knowledge about markets combined with applied research (funded by an industrial sponsor) were important factors that positively affected the opportunity recognition process. In some cases, the TT of the parent university helped a USO to overcome this juncture by guiding and motivating academics to commercialize their technology, by financing

or directly evaluating the commercial feasibility of academics' research results and by identifying and securing an industrial sponsor willing to fund the spin-off development. Surprisingly, two of our selected USOs declared that they had not recognized any concrete business opportunity.

Most of the cases did not have the necessary resources to attract and hire a surrogate entrepreneur with managerial experience and industry contacts. Instead, non-elite USOs' academic founders took the CEO position (generally full-time) with scarce knowledge of the markets or managerial experience. Moreover, they usually left their teaching or research position at the parent university. Consequently, in a non-elite context the role of the venture champion is generally assumed by one of the academic founders instead of hiring an external manager. We have also identified that non-elite USOs overcome this critical juncture by hiring the doctoral fellow student involved in the research as CEO of the spin-off. This 'cheap' way of overcoming entrepreneurial commitment may have negative effects on future critical junctures.

This study shows that gaining market credibility by non-elite USOs is a long and difficult process based on daily work, presentations, demonstrations and tests of their products/services at the client site. For example they need to offer free products trials to potential clients, have a low-cost strategy, completely adapt the products/services catalogue to the requirements of clients or even change their business model to satisfy first clients' needs. Having a patent and the prestige of the university helped some of the studied spin-offs to gain technological credibility. We do not find remarkable differences between how elite and non-elite university spin-off companies overcome the sustainability threshold.

Similar to Vohora et al. (2004) we also observe that the process of overcoming critical junctures is not strictly linear or sequential. The way a USO overcomes one juncture will affect the overcoming process of future critical junctures. For example, if the USO's founding team has not recognized a clear business opportunity, the company will have problems in properly overcoming the second critical juncture and securing an experienced manager with industry contacts (Sisltech). In addition, in the cases of Hexascreen and EAP, the lack of a surrogate entrepreneur with industry contacts and managerial experience is a liability that the USO would have to face to gain credibility in the market. Moreover, the USO may review the way the company had overcome previous critical junctures. For example, in the case of Aqsense, hiring an experienced manager helped them to review the business opportunity they had previously identified.

There are some limitations in our study that may open future lines of research. First, some of the university spin-offs selected for this study are not research-based companies. In this study, we have also included what

Vohora et al. (2004) call lifestyle companies with low levels of technological capital and IP protection. Future research should focus on studying the process of development according to the type of spin-off created. Second, we have only analysed USOs from two universities in Catalonia. Future research should include more universities with different spin-off support programmes and entrepreneurial mentalities. Third, perhaps the most under-researched aspect is the role played by the founding team in the opportunity framing and pre-organization phase.

We know very little about the role of the individual/team in acquiring resources and organizing the company. For example, how do an individual's characteristics (for example, gender, age, education) affect the acquisition of resources? Clearly, the enterprising individual is a critical component of the venture creation. Fourth, future research should aim at investigating how the environment could have influenced the acquisition of resources to overcome critical junctures. A more supportive regional context will ease USOs acquiring resources. To cope with some of the research gaps of this study, particularly the one concerning the role of the individual's cognitive processes in USO development, the knowledge based view (KBV) of the firm could be helpful.

A non-negligible contribution of the study is that it has opened a window on to the identification of different typologies of USO that have different patterns in the way they overcome the critical junctures. For example, lifestyle companies that are not based on any research or technological development represent a significant percentage of companies spun-off in non-elite contexts. Policy-makers should take into account these typologies of USO when supporting the process of spin-off creation.

From a practical standpoint, findings from this study have significant relevance for trainers, government policy-makers and nascent entrepreneurs involved in creating USOs. Policy-makers and practitioners involved in entrepreneurship advising and training need to consider designing programmes, policies and incentives that would have the greatest impact on processes which would lead to the creation of USOs. Furthermore, university academics have to bear in mind that having a breakthrough in terms of technological innovation is not enough to secure business success. Their background, social capital, market knowledge and managerial experience will play a key role in their development process.

NOTES

1. We reviewed 23 articles. Available from the authors.
2. We reviewed 31 articles. Available from the authors.

3. We may consider that knowledge is embedded in the human resources, social and technological capital of the firms.
4. http://www.webometrics.info
5. One of the most prestigious business schools in France.
6. Any tenant of a research scholarship at university.

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APPENDIX

Table 3A.1 Descriptions of the university spin-offs sample

Spin-off company	Parent university	Year of funding	Industry	Main activity
AB-BIOTICS	UAB	2004	Biotech	Development and production of micro-organisms for the food industry
DAVANTIS	UAB	2005	IT	Design and manufacture intelligent security and video surveillance software
ECOMUNICAT	UAB	2005	Consumer electronics	Solution development in the field of artificial vision and wireless communication
HEXASCREEN	UAB	2005	Biotech	Development, manufacture and commerce of equipment for the biotechnological and biomedical market
PATATABRAVA	UAB	2006	Web content	Online advertisement and organization of social events
UNIVET	UAB	2001	Biotech	Development and commercialization of treatments against pets' allergies and skin problems
X-RAY IMATEK	UAB	2006	Electronic equipment	Digital pixel detectors for medical imaging
AQSENSE	UdG	2004	IT	Develops and commercializes 3D image acquisition and processing technologies that allow high-speed in-line production inspection
EAP	UdG	2003	Content	Print-On-Demand editing and publishing
MICROBIAL	UdG	2005	Biotech	Design, production and commercialization of detection tools for pathologic cells in water and food
SISLTECH	UdG	2003	IT	Develops and implements artificial intelligence systems for the control of complex environmental processes

4. Benefiting from publicly funded pre-competitive research: differences between insiders and outsiders[1]

Verena Eckl and Dirk Engel

INTRODUCTION

Research and Development (R&D) policy is characterized by a wide range of instruments to address different forms of market failures (Arrow 1963) in the R&D value chain process. Knowledge of the causal impact of these efforts is essential for policy makers to redesign their portfolio of instruments. As David et al. (2000) and many others point out, estimations in the studies reviewed are mostly confronted with potential selection problems. Recently published studies (for example, Almus and Czarnitzki 2003; Busom 2000; Caloghirou et al. 2001; Czarnitzki et al. 2007; Lach 2002; Wallsten 2000) used state-of-the-art evaluation methods to compare funded firms with comparable non-funded firms. All these studies indicate positive, direct effects of funding on R&D expenditure and patent applications by programme participants. This finding speaks in favour of public R&D funding for firms to correct market failure.

In addition to the direct R&D funding for firms, politicians have been demanding improvements in knowledge transfer from science to industry in order to increase the commercialization of scientific discoveries. However, robust empirical evidence concerning the extent of knowledge transfer from science to industry and its determinants for specific programmes of public R&D is very rare. The present contribution attempts to investigate the relevance of these effects for Germany's Industrial Collective Research (ICR) programme. The ICR programme supports pre-competitive research and is one of the most important R&D funding schemes of the Federal Ministry of Economics and Technology. Project themes are developed 'bottom up' by firms or research institutes. By definition of the programme, they are supposed to be oriented to the needs of sectoral and even cross-sectoral groups of SMEs. Non-profit research institutes perform the pre-competitive research only. Firms can enter the

Board of Project Observers (BPO) to monitor the project progress. Several studies point out that some imperfections in the knowledge transfer from science to industry exist and firms with a high level of R&D activity self-select into R&D programmes. As a consequence, it will be not surprising if programme insiders outperform programme outsiders with regard to the use of programme results.

Pre-competitive research does not aim to commercialize brand new ideas; knowledge creation at research institutes and knowledge spillovers to industry are the main benefit of this research, although these spillovers are hard to measure. For example, Fogarty et al. (2006) use a systems approach for patent applications and citations to evaluate the spillovers of the US Advanced Technology Programme (ATP). The sophisticated procedure takes cascading sequences of patent citations into account. Within the ICR programme, however, firms cannot receive patent protection for discoveries from the programme, since research is performed mainly by research institutes. Therefore, we apply a rough measure based on a unique firm survey conducted in 2006 and ask for the use of ICR programme results and its determinants.

We will show that ICR research results have been used by both participants and non-participants. Remarkably, almost all non-participants are engaged in other publicly funded or non-publicly funded collaborative research projects with research institutes affiliated to the ICR programme. We conclude that these linkages might be a necessary prerequisite for absorbing research results from the ICR programme.

The chapter is structured as follows. First, we give some background information about the ICR programme and derive the main research question. Secondly, we present the methodological approach, followed by the empirical results of our study. Finally, we conclude and propose guidelines for future research.

BACKGROUND

The ICR Scheme

The idea of the Industrial Collective Research (ICR) programme was already taken up by the German Ministry of Economic Affairs in the early 1950s. Since 1954, the German Federation of Industrial Research Associations Otto von Guericke (AiF) has been commissioned with the execution of this programme. This research programme is financed by the Federal Ministry of Economics and Technology, with an annual budget, which currently amounts to approximately 101 million euros. About 600

to 700 collective research projects are financed from this budget. The project period averages two years and project costs vary between 50 000 and 350 000 euros (AiF 2005).

The ICR programme is characterized as pre-competitive, although the verification of 'pre-competitiveness' seems to be difficult. According to ICR guidelines, the conditions for pre-competitiveness are always fulfilled if industry-wide quality standards and regulations are developed or basic research is conducted. Pre-competitiveness is also accepted whenever results are available to all interested firms in the same or other industries and therefore have a 'public good' character.

From a policy maker's point of view, the main rationale behind public funding of ICR is the fact that small and medium-sized enterprises (SMEs) are confronted with some specific obstacles[2] in carrying out R&D. Small and medium-sized enterprises in the ICR context are defined as firms with an annual turnover below 125 million euros, including existing subsidiary and/or parent companies. Following this rationale, the ICR aims at stimulating knowledge creation for SMEs in particular (AiF 2005, p. 5).

A second rationale behind the ICR is a reduction in duplicated R&D efforts to prepare technical norms and standards, raising health and safety standards at work, the search for improved or alternative processes or materials and problems that occur in a sector of industry due to changes in the economic environment (AiF 2005, p. 8). In addition, the obstacle of underinvestment by firms due to spillovers is addressed. Research and development spillovers to competitors are difficult to avoid by firms active in R&D and producing spillovers. Projects that generate large knowledge spillovers to competitors are not likely to be undertaken by the private sector and thus, the private sector tends to underinvest in R&D (see Arrow 1963).[3]

Based on both rationales and to fulfill the conditions of pre-competitive research, the programme seeks to promote the development of industry-wide research networks, which always include SMEs, large firms and scientific research institutes. In this way, ICR is supposed to support entire sectors of industry and fields of technology in general, and SMEs in particular. From the Ministry's point of view, SMEs have to benefit from each ICR-funded collaboration project. In this sense, collaborative activities between SMEs and large enterprises (LEs) are harmless and in line with the principles of ICR if the condition mentioned above is fulfilled. One example of such collaboration is found in the automotive industry where a large company intended to apply 42 volt vehicle electrical systems (Kobe 1998) and, therefore, suppliers on the downstream value added chain had to test the feasibility of these systems.

The competitive exploitation of results starts after finishing and

transferring the project. Then, the enterprises involved – as well as any other firms – may take up the results in order to adapt them to their specific needs and build further innovations upon them. Research institutes and associations should take part in the transfer and dissemination of results, using web presentations, publications, conferences, workshops, training of employees, exhibitions or fairs (AiF 2004, 2005; Lageman et al. 1995; Welter 1995).

There are very few *ex ante* restrictions on the topics of the promoted research projects. Project ideas are ideally developed bottom up by both the firms and research institutions. Enterprises in most industrial sectors and technological fields are 'networked' by non-profit, industrial research associations. Starting out with 17 industrial research associations in 1954, today 103 of them are united under the umbrella of the AiF with approximately 50 000 firms (SMEs and LEs) and about 700 associated research institutions (AiF 2005). Only the non-profit industrial research associations are authorized to send proposals for funding. Research is typically carried out by non-profit public research institutes.

During the project execution phase, firms and industrial research associations monitor the activities of the research institute. It is necessary for SMEs to participate in the board of project observers (BPO). Given that ICR is mostly funded by federal government, ICR plans to realize an industry contribution of about 25 per cent of a project's total research expenditure. It is worth noting that imputed costs are accepted, for example, the imputed costs of firms for monitoring the milestones of the research project. However, despite the generous arrangement, 25 per cent is rarely reached.[4]

Until 2006, public ICR funding was allocated according to the average expenditure of each industrial research association in the last three years. This approach is favorable for associations with large shares of public R&D funding in the past. In consequence, newly founded research associations are disadvantaged. A new agreement came into force at the beginning of 2007. Only half of all public funding is allocated according to the old procedure while the remaining funding ignores the priorities of specific research associations. The proposals are ranked exclusively on the basis of the evaluation report of external referees (see AiF 2006). The new competitive elements may improve the selection of projects with the highest match to the benefits of ICR and, thus, spillovers of new selected projects may increase.

It is worth noting that AiF, the umbrella organization of industrial research associations, also administers other publicly funded R&D programmes, including the 'Programme INNOvation Competence' (PRO INNO).[5] PRO INNO supports national and transnational R&D cooperations between SMEs or with research institutes if a technology leap

(for example, entrance into a new technology area) or a new cooperation stage (for example, a foreign partner for the first time) is guaranteed. Additionally, temporary personnel exchanges between enterprises and research institutes are financed, as is the resumption of R&D projects after a five-year break. PRO INNO is not pre-competitive, that is, the research results remain within the enterprise. Furthermore, PRO INNO only supports SMEs according to the European Union (EU) definition while the ICR definition is much broader (turnover has to be less than 125 million euros including existing subsidiary and/or parent companies).

Research Question

There are some theoretical and empirical studies on the types of linkages between industry and universities and/or government agencies that depend particularly on incentives and the expectations of players involved (Bonaccorsi and Piccaluga 1994; Etzkowitz 1998; Stephan 1996; Zucker et al. 2002). Other studies deal with the 'absorptive capacity' of firms that stress the importance of internal R&D investments in applying external knowledge (for example, Cohen and Levinthal 1989, 1990; Kamien and Zang 2000). In addition, the complexity of knowledge and its role in knowledge transfer is analysed by some researchers (for example, Nonaka et al. 1996). The nature of new knowledge and the characteristics of the knowledge creator act as barriers to knowledge transfer and further efforts are necessary to overcome these limitations. In fact, all the studies emphasize that knowledge transfer between science and industry seems to be a difficult rather than an easy task. Strong industry–science linkages are advantageous to overcome barriers in knowledge transfer and to absorb scientific knowledge. We assume a 'pecking order' in the use of scientific knowledge depending on specific capacities and abilities of knowledge creators as well as knowledge recipients. In this study we shed light on the latter empirically.

Firms which have entered the board of project observers may have the easiest access to tacit knowledge created in ICR projects. By contrast, firms with the lowest level of embeddedness to ICR programmes may have the lowest propensity to absorb ICR results. In a similar manner, we argue that size-specific differences exist in the use of ICR results. Large enterprises have economies of scale to conduct R&D activities continuously. Their competencies and capacity to absorb results are significantly greater than those of SMEs. In this regard, we should not be surprised about a significantly lower propensity of participating SMEs to use ICR results compared to LEs.

The question about a 'pecking order' in the use of external knowledge

in this study is directly linked to ICR objectives. While ICR guidelines suggest benefits for entire sectors of industry and fields of technology, it is appropriate to ask about the use of ICR results by participating and non-participating firms. The ICR guidelines further point out that SMEs in particular have to be addressed by ICR, although the wording 'particular use' leaves room for interpretation. One may argue that ICR is working very well whenever participating SMEs show a higher propensity to use ICR results than participating LEs. In contrast, in the light of some typical SME obstacles to absorbing results we should not be surprised at a significantly lower propensity of participating SMEs to use ICR results compared to LEs.

METHODOLOGY AND DATA

Measurement of ICR Benefits

Industrial Collective Research benefits may exist on several levels. Grimaldi and Tunzelmann (2002, 2003) contribute to the debate on the definition of reliable performance measures of public programmes. As expected, subjective evaluation tends to be a more optimistic rather than a more objective measure of programme outcomes (for example, number of patents, publications, commercial exploitation and follow-up activities). The authors argue that the indicators should be independent of subjective factors and should address all possible positive externalities and benefits for all participants.

The outcomes of a pre-competitive research programme are different from those of programmes emphasizing commercialization of ideas. Knowledge spillovers are the most relevant benefit of ICR programmes. In this sense, patent applications due to ICR participation and their citation by non-participants may be one approach to test empirically the relevance of knowledge spillovers. For example, Fogarty et al. (2006) use a systems approach for patent applications and citations to evaluate the knowledge spillovers of the US Advanced Technology Programme.

Patent applications can be made by industrial research associations and/or research institutes, although ICR does not focus on patent applications as a main objective. This is because patent applications by their nature may restrain broad knowledge spillovers and conflict, to some extent, with the pre-competitive assumption of ICR research projects. Thus, patent applications cannot be a yardstick to measure knowledge spillovers from the ICR programme. Instead, we ask about the use of research results obtained from ICR with the question, 'Have you ever applied ICR

research results?', which represents a first attempt to shed light on the role of knowledge spillovers.

From a methodological point of view, more precise questions with regard to the context of the use of ICR results would be the best choice, but greater precision can only be gained at the price of a lower response from firms in general. Thus, the simple question about the use of ICR results should be appropriate to resolve this trade-off. Of course, this measure has some limitations. Generally, it is difficult to evaluate the extent of the usefulness of ICR results for a single firm because the criteria might differ between the firms. In addition, some ICR research results are long-term oriented. In many cases immense efforts are necessary to bring new knowledge to the functional business model. Probably, firms do not know in the long term that some of the new technologies are created by ICR. Thus, we tend to underestimate the level of use of ICR results.

It should be noted that 65 per cent of the firms surveyed in our sample did not answer the above-mentioned question. We checked the response behavior of these firms in detail and detected that 90 per cent of these respondents do not know about ICR. Furthermore, almost all of them ignored each question in the block concerning participation in ICR. As a result, we relabel non-response to the question as 'no use' of ICR research results.

Knowledge Use Equation

The equation describing the use of ICR contains the dependent variable Y_i for firm i, which is explained by the vector of exogenous variables X_i. The Bernoulli distributed variable Y_i takes the value one (firm knows ICR) or zero (firm does not know ICR) in the first equation. The probability of the 'knowledge of ICR' can be estimated by applying a binary probit model:

$$\Pr(Y_i = 1|X = x_i) = \Phi(x_i'\beta) \qquad \forall i = 1, \ldots, N. \tag{4.1}$$

Where: Φ denotes the cumulative standard normal distribution.

The first set of variables of interest measures the *degree of embeddedness* to an ICR programme. Here we define four groups of firms:

1. participating firms in the board of project observers of ICR research projects (*PARTICIP*);
2. firms which are engaged in other research projects with industrial research associations and their research institutes (*AFFIL*);
3. individual firms which are members of industrial associations but are not involved in ICR projects (*MEMBERS*); and
4. remaining firms (*OUTSIDERS*).

Concerning the *size-specific obstacles* in the use of external knowledge and the aim of the ICR programme to support SME in particular, the *PARTICIP* variable is combined with the status of an SME. PARTICIP_SME contains participating SME and PARTICIP_LE contains LE involved in publicly funded ICR research projects. The definition of the group of affiliated firms follows two motives. First, as mentioned above, the AiF manages other publicly funded programmes and, thus, funded firms in these programmes are affiliated with the research of industrial research associations and institutes to some extent. Secondly, some firms collaborate with industrial research associations in non-publicly funded projects. These firms may also have easier access to ICR results compared to firms without this degree of embededdness.

We expect a ranking of use according to embeddedness in the ICR programme and its agents. Due to a lesser absorptive capacity of SMEs, large participating companies may have the highest propensity to apply ICR research results, followed by participating SMEs, AFFIL, MEMBERS and OUTSIDERS. Probably, OUTSIDERS are indirectly affiliated with industrial research associations through membership in sector-specific assemblies, which are linked to industrial research associations.

One stylized fact of evaluation studies is that participants form a selective group of population. Selection into a programme may result from screening procedures derived by programme managers and from the income–cost ratio of specific firms participating in a certain programme. Concerning the conception of the ICR programme, the participation of firms is mostly affected by the latter factor.

Pre-selection implies that coefficient estimates do not measure effects of embeddedness in the ICR programme only. The estimates are also influenced by observable and unobservable competencies as well as interests in taking part in the programme. We will discuss this point in detail in the next section. In order to eliminate biased estimates due to unobserved firm heterogeneity, an instrumental variable (IV) approach will be applied. The implementation of this approach needs to fulfill some restrictive requirements: (a) the instrument variable must be correlated with the explanatory variable, that is, participation in ICR research projects; and (b) the instrument variable must be uncorrelated with the error term in the main equation. We use the two-stage least squares (2SLS) technique to enable information from multiple instruments to be combined. In the first stage, each endogenous covariate from the main equation is regressed on all valid instruments. In the second stage, we estimate the main regression whereby each endogenous covariate is replaced with its approximation of the first stage estimation.

Irrespective of the assumption that participants differ from non-participants, we further assume differences within the group of participants.

Industrial Collective Research guidelines impose the obligation to have five SMEs, defined as firms with less than 125 million euros annual turnover, in large project monitoring boards or at least half of the firms in smaller boards (AiF 2004, p. 4). Based on the heterogeneous nature of projects (for example, short-term versus long-term projects) and the particular interests of SMEs and LEs (for example, the planned technical solution is not that attractive to SMEs), it is sometimes difficult to fulfill this requirement, despite the fact that the threshold value to define the SME in ICR is more than twice as much as the European Commission's threshold of 50 million euros, in 2003. Maybe, the higher threshold value in ICR is itself an indication of difficulties to fulfill the above-mentioned assumption. From these difficulties we assume that selection into the programme may differ between SMEs and large firms. Therefore, we estimate separate IV regression: one for SMEs and one for large firms.

We further consider a large set of exogenous variables to control for some basic facts of firms' internal and external resources. These resources are:

- *Firms' internal resources*: R&D intensity (R&D expenditure related to turnover, R&D employees related to all employees); innovative sales (turnover with new market products/refined products related to total turnover); number of patents in the last two years; and exports (export turnover related to total turnover).
- *Firms' external resources*: informal and formal ways of external knowledge acquisition (universities, customers, suppliers, and so on); R&D co-operation; participation in other research programmes; industry; shareholders and the kinds of goods produced by the firm, namely, finished goods only, semi-finished goods and finished goods or semi-finished goods only.

Data

The analysis is based on a questionnaire survey from 2006. The survey was conducted by RWI Essen and WSF Kerpen in the context of a joint evaluation of the Industrial Collective Research from 2005 to 2009, on behalf of the German Federal Ministry of Economics and Technology. The aim of the sampling procedure was to reach those firms that might be in contact with ICR. Thus, the population consists of all manufacturing establishments and some related industries like transportation and R&D-intensive services. With the exception of R&D services and the biotechnology industry the population contains no micro-firms with less than 2 million euros turnover per year because it is not expected that those firms perform R&D. In this stratification we draw 14 000 firm addresses

Table 4.1 Number of firms in firm size groups

	INSIDER			OUTSIDER	
	PARTICIP	AFFIL	MEMBER	Remaining firms	All
LEs	15	27	20	160	222
SMEs	19	117	10	543	689
SMEs & LEs	34	144	30	703	911

Notes: LEs: Large enterprises (annual turnover 50 million euros or higher); SMEs: small and medium-sized enterprises with annual turnover between 2 million and 50 million euros; PARTICP: participating firms in PBO of ICR projects; AFFIL: firms who are engaged in other research projects with industrial research associations and their research institutes; MEMBER: MEMBERS of industrial associations which are not involved in ICR projects; OUT: OUTSIDER firms who are not affiliated with the industrial research associations in any way.

from the AMADEUS database that contains information about 812 583 enterprises with headquarters in Germany.[6]

The data were collected based on a postal questionnaire. We only received about 911 analysable responses and hence had a high non-response rate of about 93.5 per cent. This high non-response rate may be related to the subject of our questionnaire. Since ICR is hardly well known, firms might be less motivated to fill in the questionnaire. Thus, we might have a sample selection that is related to the awareness of ICR. Because the determinants of ICR commitment are the topic of this study this kind of sample selection is assessed as positive rather than problematic.

OUTSIDERS (remaining firms that do not have any formal affiliations to the ICR programme and ICR authorities) form the largest group in our firm survey. In contrast, firms participating in the ICR programme are very rare (see Table 4.1). The differentiation according to firm size further shows that a large fraction of firms is small and medium-sized ones.

In addition, we also performed semi-structured face-to-face interviews with 12 out of 103 randomly selected research associations and randomly selected research projects within those associations in 2006. The subjects of the interviews were the participation of SMEs, compliance with the pre-competitiveness criterion, as well as questions about the project workflow and the industry contribution.

EMPIRICAL RESULTS

Table 4.2 shows that 63 of all 911 surveyed firms reported that ICR results affected firms' activities concerning commercialization of results,

Table 4.2 The use of ICR results

	PARTICIP	AFFIL	MEMBER	OUT	ALL
	Number of users				
LEs (users)	8	12	3	2	25
SMEs (users)	9	21	0	8	38
LEs+SMEs (users)	17	33	3	10	63
	Share of users in all firms of the group (in %)				
LEs (users)	53.3	44.4	15.0	1.3	11.3
SMEs (users)	47.4	17.9	0.0	1.5	5.5
LEs+SMEs (users)	50.0	22.9	10.0	1.4	6.9

Note: See notes to Table 4.1.

or strengthening R&D activities. Industrial Collective Research results are used by both SMEs and LEs to a significant extent: 39.6 per cent of users in our sample are LEs. This finding may emphasize the relevance of the ICR programme to industry as a whole, which has been characterized by heterogeneous firm sizes. The share of users related to all surveyed firms lies around 7 per cent and thus, is very small. On the supply side, several barriers including the complexity of knowledge and incentives to codify new knowledge, for example, may hamper the diffusion of ICR results. On the demand side, the mismatch of the research efforts of firms and research institutes carrying out ICR research projects may be central in explaining the low share of users. Here it is worth noting that 28 per cent of non-users in the group of non-participants are R&D intensive firms with a ratio of R&D expenditures to turnover above 3.5 per cent. In absolute terms, 233 firms are R&D intensive but did not attend the board of project observers and these firms did not use ICR results. From this it follows that the ratio of potential users in the group of non-participants and users in the group of non-participants exceeds five. One further reason for the low number of users might be missing linkages of firms to ICR authorities.

Concerning the degree of embeddedness to the ICR programme, a minority of users (17 of 63) were embedded directly in project monitoring of ICR while more than half of users were affiliated firms (33 of 63). Two-thirds of them received public funding from other research programmes, which have been phased out by the umbrella organization of industrial research associations and classified as industry–science collaborative research projects. The remaining users are engaged in non-funded research projects with industrial research associations. Ten of 63 users are firms outside ICR participation, affiliation or direct membership. We conclude that existing

formal linkages between industry and non-profit research institutes seem to be the basic prerequisite of non-participants to absorb ICR results. It is not surprising that the share of users is highest in the group of participants (see Table 4.2). More than half of the participating firms reported that they applied ICR results, which means there is a high number of participating firms that did not use ICR results. The reason might be that ICR focuses on pre-competitive research and thus the probability of project breaks, adjustment of time schedules and project targets or project cancellation is higher than in follow-on research and its commercialization. Our interviews with ICR representatives showed that there are many reasons for this observation. Changes in legislation, dropouts of firms, long-term research efforts and technical difficulties were the most frequently mentioned reasons. The recent implementation of competitive elements in the selection process strengthens a 'pick the winner' strategy. Probably, the overall benefits of the ICR programme will increase in the future.

As expected, the share of users decreases with ICR embeddedness. Twenty-three per cent of affiliated firms and 1.4 per cent of outsiders are users of ICR results in our sample. Obviously, affiliation may enhance the access to ICR results. Affiliated LEs use ICR research results significantly more frequently than affiliated SMEs. In contrast, the share of users differs only slightly according to firm size in the group of outsiders.

Probably, group differences in the propensity to use ICR results are based on differences in other characteristics, such as industrial affiliation and R&D activity. Applying a binomial probit model we take these characteristics into account and test for significant differences between the four groups (Table 4.3). The results show that the observed pattern for the different groups also holds in the multivariate analysis. Since the share of users is very similar between participating SMEs and participating LEs, the coefficient estimates for indicator variables do not differ significantly between the two groups. The result may indicate that participating SMEs benefit from ICR to a similar extent as participating LEs. As pointed out in the previous section, a further regression is necessary to eliminate biases due to different selection procedures in the ICR programme.

In line with descriptive findings, affiliated LEs have a significantly higher share of the use of ICR results than affiliated SMEs. Following the argument concerning absorptive capacity, LEs may have some advantages in absorbing ICR results and commercializing them. Furthermore, the results may suggest that affiliated SMEs are more oriented to the commercialization of research ideas and thus, these firms are less interested in results of pre-competitive research than larger companies.

Affiliated LEs do not differ significantly from participating LEs. In contrast to this finding, participating SMEs outperform affiliated SMEs with

Table 4.3 Coefficient estimates of binomial probit model (1 = use of ICR results, 0 = otherwise)

Variables	All firms	SMEs only	LEs only
PARTICIP_SME	1.346***	1.536***	
	(0.395)	(0.486)	
PARTICIP_LE	1.397**		1.244***
	(0.457)		(0.451)
AFFIL_SME	0.847***	0.903***	
	(0.195)	(0.234)	
AFFIL_LE	1.503***		1.438***
	(0.305)		(0.334)
MEMBERS	0.152	−0.302	0.370
	(0.288)	(0.485)	(0.377)
R&D Target: process development	0.363**	0.367*	0.298
	(0.173)	(0.214)	(0.336)
R&D Target: new markets	0.301**	0.370*	−0.104
	(0.173)	(0.209)	(0.302)
Formal knowledge use: non-profit research institutes	0.500	0.510**	0.641*
	(0.182)	(0.232)	(0.342)
Shareholder impact on business activity	$3.62e^{-06}$***	0.004	$2.98e^{-06}$
	$(9.60e^{-06})$	(0.009)	$(1.05e^{-05})$
Patents	0.354	0.733**	0.037
	(0.240)	(0.362)	(0.363)
Manufacturing sector	0.081	0.327	−0.236
	(0.197)	(0.250)	(0.295)
R&D to turnover ratio (%)	0.219	0.175	0.124
	(0.175)	(0.230)	(0.351)
(R&D to turnover ratio (%))²	0.043***	0.061***	0.365**
	(0.019)	(0.022)	(0.184)
Constant	−0.001***	−0.001***	−0.044**
	$(3.82E^{-04})$	$(4.40E^{-04})$	(0.019)
$\beta_{PARTICIP\_LE} = \beta_{PARTICIP\_SME}$	0.01	/	/
$\beta_{PARTICIP\_LE} = \beta_{AFFIL\_LE}$	0.04	/	/
$\beta_{PARTICIP\_SME} = \beta_{AFFIL\_SME}$	1.23	1.32	/
$\beta_{AFFIL\_LE} = \beta_{AFFIL\_SME}$	4.32**	/	0.14
Pseudo R^2	0.383	0.392	0.425
No. of observations	887	673	214

Notes: See notes to Table 4.1.
Heteroscedastic-robust standard errors are derived.
*** Significant at 1 per cent level; ** significant at 5 per cent level; * significant at 10 per cent level. Reference group: OUTSIDERS.

regard to the use of ICR results. The findings indicate that effects of negative selection due to the obligatory presence of SMEs are compensated for by positive effects of programme embeddedness and pre-selection of SMEs with above average interest in the group of participants.

MEMBERS do not differ from OUTSIDERS with regard to the use of ICR results. On the one hand, membership only apparently may not provide efficient access to ICR results. On the other hand, members may have lower interest in ICR results. Results of our interviews with industrial research associations emphasize that the latter factor seems to be the most relevant one. The estimation results clearly suggest a significant positive correlation between the use of ICR results and a strong embeddedness in ICR. Affiliation with research institutes, which are engaged in ICR projects, seems to be sufficient to participate in the ICR programme.

The other significant characteristics are mentioned briefly. Participation in the manufacturing sector, as well as R&D intensity, correlates positively with the absorption of ICR results. However, only the quadratic term of R&D intensity (that is, R&D expenditure as a percentage of turnover) is significant and positive. Furthermore, SMEs with industrial shareholders also have a higher propensity to use ICR results.

Concerning the assumption of selection into the ICR programme, we present the results of the instrumental variable approach in Table 4.4. It is expected that the supply of relevant scientists in the surroundings of the individual firm will enhance the creation of formal and informal cooperation between firms and public research. From a theoretical point of view, density of scientists should not guarantee that ICR results are used to a higher extent. In the first step, we tried a number of instrument variables to check the validity of IV requirements, namely the assumption of the relevance and the suitability of the IV approach:

- number of ICR research associations (different radiuses);
- number of ICR research institutes (different radiuses);
- number of acquired third-party funds per district and within a radius of 50 km;
- number of university researchers in terms of engineers and natural scientists within a district and within a radius of 50 km.

Only the variable *number of university funded engineers within the district of a firm's location* shows significant correlation with the participation state. This variable forces the collaboration between research institutes and industry in both the SME and the LE regression. Irrespective of the significance of the instrument variable in the first stage estimation, the empirical tests differ remarkably in the SME and LE regressions.

Table 4.4 Coefficient estimates of instrument variable approach (1 = use of ICR results, 0 = otherwise)

Variables	2SLS for SMEs	2SLS for LEs
PARTICIP	0.679	1.205***
	(0.555)	(0.462)
R&D target: process development	0.049**	−0.023
	(0.022)	(0.056)
R&D target: new markets	0.007	0.026
	(0.019)	(0.056)
Formal knowledge use: non-profit research institutes	0.071***	0.073
	(0.024)	(0.081)
Shareholder impact on business activity	0.019	−0.085*
	(0.029)	(0.052)
Patents	0.015	0.033
	(0.880)	(0.058)
Manufacturing sector	0.021	−0.004
	(0.029)	(0.059)
R&D to turnover ratio (%)	0.005*	−0.000
	(0.003)	(0.009)
(R&D to turnover ratio (%))^2	$-4.39e^{-5}$*	$3.25e^{-5}$
	$(1.99e^{-5})$	$(6.80e^{-5})$
Constant	−0.035	0.404***
	(0.022)	(0.058)
Partial R^2	0.008	0.0453
F (1)	5.33	9.54
Number of observations	670#	211#

Notes: See notes to Table 4.1.
*** Significant at 1 per cent level; ** significant at 5 per cent level; * significant at 10 per cent level.
Instrument variable: *Number of university funded engineers in the district of firm's location*.
The results for the first stage regressions can be obtained from the authors on request.
Hansen J statistic, as well as Sargan statistic to check the suitability of IV approach are not funded by reason of taking one instrument only.
Different number of observations results from the fact that six enterprises did not have postcodes to merge successfully with our IV.

The empirical F-test shows values around the critical value of 10 in the regression for LEs, which is usually accepted for significant correlation. An additional test statistic to evaluate the relevance of instruments is Shea's (1997) first stage partial R^2 of excluded instruments. This statistic also confirms the validity of the chosen instruments in the LE regression. Compared to that, the IV estimation for SMEs may suffer from some limitations. Empirical F-test and partial R^2 values are remarkably lower and

below the critical values. For SMEs we cannot rule out the fact that the IV approach might suffer from inconsistencies due to weak instruments (see Bound et al. 1995).

The results of the instrumental variable approach at least confirm the results for LEs. Therefore we now have a rather unbiased significant positive effect of participation in ICR project performance for LEs. The coefficient reaches 1.205 and is almost as high as the interaction effect for participating LEs (PARTICIP_LE) in Table 4.3. The small difference further suggests that the upward bias due to unobservable factors is low. Since the IV approach failed for SMEs we assume that there are hitherto unobserved differences between participating SMEs and LEs. At this point, we can only speculate whether the upward bias is similar for SMEs.

As we compare the means of important characteristics between participating LEs and SMEs, we briefly shed light on the question why IV does not work for SMEs (see Table 4.5). Remarkably, both the R&D turnover share and the R&D personnel share of participating SMEs are twice as high as for participating LEs. Furthermore, we detect no significant differences with respect to the shares of academics, new and refined products and the share of firms with at least one patent application. These results indicate no differences in the absorptive capacity of participating SMEs and LEs, although major differences may exist in the use of external resources to prepare R&D. Formal external information sources, as well as cooperation, are significantly less important for participating SMEs than for participating LEs. Consequently, university orientation toward third-party funding at the firm's location is less advantageous for SMEs than for LEs. Maybe this empirical observation explains the failed IV approach with respect to the use of ICR results by SMEs. There must be other unobservable reasons for SMEs to join ICR project management that must be left to be subject of future research, although we can speculate, based on the background data gathered in our interviews with the executives of research institutes and associations. On the one hand, SMEs may try to get in contact with LEs in order to gain potential new customers. On the other hand, LEs may want to involve their suppliers in ICR project monitoring due to the ICR guidelines obligation to include SMEs, or because the supplier's knowledge can contribute to ICR project execution.

CONCLUSIONS AND FURTHER RESEARCH

This chapter has presented empirical evidence regarding the extent and determinants of knowledge transfer from science to industry for

Table 4.5 Comparison of participating large enterprises (LEs) and small and medium enterprises (SMEs)

Means of variables and significance					
Variable	LEs	SMEs	Variable	LEs	SMEs
Source of information			Vertical	0.667	0.526
Sectoral association	0.600	0.263**	Horizontal	0.533	0.158**
Chamber of commerce	0.267	0.053*	High-tech joint ventures	0.200	0.000**
Institute of business develop.	0.333	0.263	Public research associations	0.600	0.368
Univ. tech. transfer offices	0.400	0.368	Other formal utilization	0.000	0.000
Exhibitions	0.733	0.842	Industry		
Conferences/workshops	1.000	0.789*	MF of foods & beverages	0.000	0.053
Journals	0.800	0.789	MF of textiles and leather	0.000	0.053
Face to face contact	0.467	0.368	MF of wood and paper	0.000	0.105
Supplier & customer	0.867	1.000	MF of chemicals	0.067	0.158
Consulting agency	0.133	0.158	MF of biotechnology	0.067	0.105
Internet	0.533	0.579	MF of machinery	0.267	0.105
Other sources of information	0.067	0.053	MF of transport equipment	0.133	0.053
R&D targets			MF of metals	0.200	0.211
Product refinement	0.800	0.789	MF of rubber, plastic, glass	0.000	0.053
Product development	0.933	0.737	MF of elect. & optical eqpt.	0.067	0.158
Open new markets	0.733	0.579	MF other	0.000	0.000
Process refinement	0.800	0.421**	Elec., gas & water supply	0.667	0.000
Process development	0.667	0.368*	Transport, storage & com.	0.000	0.000
Standardization	0.400	0.211	Real estate and business	0.133	0.000
Conservation of nature	0.467	0.158*	Other business activities	0.000	0.000

Quality improvement	0.667	0.632	Research and development	0.667	0.000
Rationalization	0.600	0.579	Impact on business activity	0.555	0.188**
Other targets	0.000	0.000	Turnover (in millions)	7947	14
Cooperation partners			Type of goods		
Horizontal	0.533	0.188**	Semi & finished goods	0.313	0.250
Vertical	0.733	0.313**	Semi-finished goods	0.438	0.250
With universities	0.800	0.438**	Finished goods	0.500	0.250
Other research institutes	0.467	0.250	Shares % (in 2005)		
With applied universities	0.000	0.125	Exports	58.27	35.17**
Other partners	0.267	0.063	Refined products	20.00	20.62
Inf. use of ext. knowledge			New products	16.67	13.53
Horizontal	0.933	0.895	New market products	3.33	7.57
Vertical	0.667	0.474	University graduates	16.38	16.90
With (applied) universities	0.733	0.632	R&D employees	5.00	10.14
Other research institutes	0.467	0.632	R&D turnover	2.54	9.19**
Institute of business develop.	0.267	0.316	Patents		
Sectoral association	0.467	0.211	Patents (yes/no)	0.667	0.500
Chamber of commerce	0.200	0.053	Number of patents	139	2
Formal use of ext. knowledge					
License ordering	0.200	0.053			
Universities	0.600	0.368			
Applied universities	0.267	0.263			

Notes: See notes to Table 4.1.
RWI Essen/WSF Questionnaire Survey 2006, own calculations.
** Significant at the 5 per cent level; * significant at the 10 per cent level.
Number of observations: 887.

Germany's Industrial Collective Research programme. Within the ICR programme, industrial research associations initiate publicly funded research projects, which are carried out by non-profit oriented research institutes and each project has to be monitored by several firms on the board of project observers.

Based on unique firm data surveyed in 2006, we detected that 63 of 911 firms answered that they used ICR results. The majority of users had not participated in a board of project observers. Asking for key competencies to absorb ICR results, three quarters of non-participants reported affiliation to industrial research associations due to formal cooperation in otherwise publicly or privately funded research projects. In the remaining 25 per cent, firms with linkages to university research institutes show a significantly higher propensity to use ICR results than firms without those linkages. Based on these findings we draw the conclusion that existing formal linkages between industry and non-profit research institutes seems to be the basic prerequisite for non-participants to absorb ICR results. Our multivariate analysis strengthened this conclusion and further suggested a pecking order in the use of ICR results. In other words, the stronger the linkages to ICR actors, the higher the propensity to use the ICR results is.

The diffusion of ICR results to non-participants works, to some extent, but is limited to a specific group of firms. Apart from that, the share of users related to all surveyed firms is around 7 per cent and therefore, very small. It is worth noting that many non-users are R&D-intensive firms. These firms form the group of potential users which are not attracted by ICR for whatever reasons. Building competencies to enter into collaborative projects and increasing the match between interests of industry and public research may be one important way for managers and policy makers to enhance the diffusion of ICR results to potential users.

Results of our multivariate analysis further suggest that the propensity to use results did not differ significantly between participating SMEs and participating LEs. Contrary to that, non-participating LEs with other linkages to industrial research associations show a significantly higher use of ICR results than SMEs with similar linkages. Concerning the size-specific obstacles for the absorption of external knowledge, we interpret this finding as evidence of a particular use for participating SMEs. Within the group of non-participants we fail to derive a similar conclusion for non-participating SMEs. In general, LEs play a key role in pushing technology development via the ICR programme. It is probable that participation by SMEs may result of their own accord, as well as at the suggestion of LEs. Maybe collaboration between small and large enterprises is essential to attract SMEs to programme participation, entering into collaborative projects between industry and science and, thus, for the diffusion of ICR

results. In our view, policy makers should not be afraid to emphasize the central role of LEs in order to improve knowledge diffusion.

Further research may incorporate a more sophisticated measurement of knowledge spillovers from ICR, compared with the rough measure used here to address the spillover of application-oriented results. Asking about specific technologies or long-term effects of ICR funded collaborations may provide a more robust view of knowledge spillovers of the ICR programme. The causality between participation in the ICR programme and other programmes remains of particular interest. Future research should also emphasize the outcomes of specific projects for each partner. This approach may address the specific aim of the ICR programme ('particular benefit for SMEs') better. It might also be that LEs only benefit from ICR results in specific projects, although this cannot be confirmed by our survey data. Probably, differences in quality between industrial associations are expressed partially by industry affiliation variables and correlate with the extent of knowledge diffusion. Finally, yet importantly, the question of information about ICR and how it is disseminated warrants further investigation.

NOTES

1. This chapter emerged within the context of the Evaluation of the Industrial Collective Research Scheme (Durchführung der erweiterten Erfolgskontrolle beim Programmem zur Förderung der Industriellen Gemeinschaftsforschung und –entwicklung (IGF)) conducted by RWI Essen and WSF Kerpen in 2005–09 financed by the German Federal Ministry of Economics and Technology. Special thanks are expressed to the project leader Bernhard Lageman (RWI Essen) for research guidance and support. We also thank Rainer Graskamp, Joel Stiebale (RWI Essen) and two anonymous reviewers for suggestions and discussion on an earlier draft of this chapter. A detailed descriptive analysis of the data is found in the IGF project report of RWI Essen/WSF Kerpen (2006).
2. Those difficulties are, for example, little spread of risk or lack of financial and human resources. For an extensive overview see Nooteboom (1994).
3. Griliches (1992) reviewed the literature of R&D spillovers. His study shows that social benefits of R&D may remain significantly above the private benefit of R&D-active firms. He argued, however, that estimates of social return may be upwardly biased.
4. This statement is based on results of our interviews with representatives of the industrial research associations between 2005 and 2007.
5. Another public technology programme for SME is Network Management East (NEMO) that encourages the formation of regional networks of SME and business-oriented research institutes in East Germany by the promotion of technologically and economically qualified management services (for further information see: http://www.forschungskoop.de/).
6. AMADEUS provides longitudinal data on employment, turnover, 23 balance sheet items and 25 profit and loss account items over a period of up to ten years. Additionally, ownership information (for example, owner, manager, affiliates), trade descriptions and activity codes (NACE or WZ 2003 and others) and financial information are frequently updated in the database. The data set is collected by the Bureau Van Dijk (BvD), which cooperates in Germany with Creditreform.

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5. A feminist inquiry into entrepreneurship training

Janice Byrne and Alain Fayolle

INTRODUCTION

Globally, females still represent 'a minority of those that are self-employed, start new firms, or are small business owner-managers' (Delmar and Holmquist 2003, p. 46). Evidence that female-owned firms exhibit slower growth, report lower average earnings and are less likely to export than their male counterparts has led many nations to establish gender-specific training facilities (Orser and Riding 2006). Women find themselves in very different situations compared to men, and these different situations result in women entrepreneurs having different perceptions about the world (Allen et al. 2008). The concept of support structures solely for female entrepreneurs has thus gained considerable credence. 'The implications for policymaking that emerge from this diversity of circumstances and perspectives point to the need for customized or targeted policies' (Allen et al. 2008, p. 10). There are currently four main areas where it is thought that female entrepreneurs might benefit from support: information and education, networking activities, targeted finance activities and targeted business support activities (Welter 2004).

However, while the incidence of gender-based small business training programmes is increasing (Orser and Riding 2006), there is a lack of consensus regarding the need for such external intervention (Welter 2004). The fact that researchers dispute the extent to which differences between male and female entrepreneurs exist (de Bruin et al. 2007) implies that the very basis for such programmes may be questioned. Gender-streamed training and assistance programmes remain under-researched and thus little is known about the design, delivery and outcomes of such programmes. Drawing on entrepreneurship education literature, we apply a teaching model framework to examine women's entrepreneurship training. This framework identifies important ontological and educational considerations for academics, practitioners and policy makers seeking to implement training programmes. An ontological interrogation of conceptions

of women's entrepreneurship training highlights and illuminates various (often implicit) feminist assumptions. We believe that grounding feminist assumptions strongly influences the rationale, design and implementation of entrepreneurship programmes. The framework also guides our inquiry into the literature with respect to such educational-level questions as why (programme objectives and goals), for whom (key targets and audiences), for which results (evaluation and assessment), what (course contents) and how (what methods and pedagogies are used). Our application of the teaching model framework helps present an overall view of current research in the area as well as highlight areas of theoretical weakness or conflict.

This chapter is divided into four parts. We begin our analysis by briefly introducing feminist theorizing on the current gender imbalance in entrepreneurial activity. Then we outline the entrepreneurship education teaching model framework and present considerations at the ontological level which underpin the question of entrepreneurship education for women. In the following section we present research findings with respect to the educational dimensions of such programmes. Finally, we conclude our analysis by presenting the implications of three feminist approaches to entrepreneurship education.

ENTREPRENEURSHIP AND FEMINIST THEORIZING

Studies investigating the respective human, social and financial capital of men and women entrepreneurs deliver conflicting findings (de Bruin et al. 2007). There is a lack of consensus regarding the comparative performance of male and female owned firms and differing accounts are given of their experience of ownership. This lack of consensus on difference or similarity between male and female entrepreneurs echoes debates in feminist theorizing.

Feminist theoretical frameworks address the question of women's subordination to men: how this arose, how and why it is perpetuated, how it might be changed and (sometimes) what life would be like without it (Acker 1987). Those researchers applying feminist theorizing to entrepreneurship have not been plentiful (examples include Ahl 2002, 2006; Bird and Brush 2002; Fischer et al. 1993; Marlow and Patton 2005; Mirchandani 1999), however, those that have, yield thought-provoking results and illuminate numerous unquestioned assumptions (see Fischer et al. 1993). Ahl (2006) showed how three strands of feminist theory underpin the differing explanations of gender disparity in entrepreneurship – liberal feminism, social

feminism and social constructionist feminism. Each perspective offers its own explanation for the current state of play in women's entrepreneurship. A brief overview of these three stands of feminist theory, and their application to women's entrepreneurship is presented below.

Liberal Feminism (LF)

Liberal feminist theory adopts an essentialist viewpoint in that it is based on the belief that both sexes are essentially similar. Rational thinking is assumed and both men and women are viewed as 'equally able'. Societal incidences of women's subordination result from discrimination or structural barriers (Ahl 2006; Fischer et al. 1993). In this view, structural factors in the economy prevent women from gaining experience, access to markets or resources necessary for entrepreneurship (Brush et al. 2004). Liberal feminism posits that women realize their full potential less frequently because they are deprived of essential opportunities like education (Fischer et al. 1993), excluded from key financial networks (Carsrud et al. 1986) or come from lower paying jobs (Verheul and Thurik 2001). Common stereotyping practices may constitute a significant barrier for prospective entrepreneurs, for instance, girls may be discouraged from taking scientific or engineering based options in school, bank managers or venture capitalists may decline or disfavour women entrepreneurs seeking finance. Liberal feminism argues for the identification and subsequent eradication of both legal discrimination and the more insidious forms of discrimination. The idea is that women can act to eliminate these barriers. They are encouraged to take action to rectify the imbalance: to form 'girls' networks' to rival the 'old boys networks' (Hisrich and Brush 1984) or to address educational and occupational segregation (Delmar and Holmquist 2003). Once these societal inequities are removed, men and women can operate on a level playing field.

Social Feminism (SF)

A second body of theory is referred to as social feminism (SF).[1] SF assumes that men and women are seen to be or have become different (Ahl 2006). Since birth they are exposed to different experiences and thus have fundamentally different ways of viewing the world (Fischer et al. 1993). Women's socialization creates different perspectives, goals and choices for women (Brush 2006) and they choose their business area accordingly – thus the emergence of 'feminine' sectors of activity (services, retail, and so on). The relationship between family and work has been shown to be stronger for women. Rather than seeing their business as a 'separate economic

unit in a social world', Brush (1992) concluded that women view their business as an interconnected system of relations (family, community and business). These differences do not imply that women will be less effective in business than men, but only that they may adopt different approaches which may, or may not, be equally as effective as the approaches adopted by men (Watson and Robinson 2003).

Research has investigated differing 'entrepreneurial characteristics' between men and women. It has been found that women have lower levels of self-efficacy, less preference for entrepreneurship and identify less with the entrepreneurship concept (Matthews and Moser 1995; Verheul et al. 2005). Women incorporate compassion and support into their ventures (Holliday and Letherby 1993), have unique management and leadership styles (Chaganti 1986) and use different opportunity identification processes (DeTienne and Chandler 2007). Social feminism theorists often view feminine traits as 'benefits' and 'resources' to be put to constructive use and capitalized on or taken into account. Social feminists celebrate 'equality in difference'.

Yet for some theorists, using concepts of sameness (LF) or difference (SF) between male and female entrepreneurs is unhelpful. Liberal and social feminist inspired interpretations implicitly advocate the 'male standard' of entrepreneurship as the desired standard (Ahl 2006) and contribute to a 'deficit' view of women (Mirchandani 1999). Women's entrepreneurship researchers adopting LF and SF assumptions perpetuate gender as the primary variable for stratification. A third strand of feminist thinking – social constructionist feminism – questions the use of sex as the defining variable.

Social Constructionist Feminism (SCF)

Social constructionism brings to feminism the belief that identities are socially and linguistically constructed (Fiaccadori 2006). Our identities can be shaped and changed. SCF theorists believe that gender is something that is 'performed' rather than something that 'is'. Gendering is a socially systemic process which is produced – and reproduced – through power relations in society (Calas and Smircich 2006). Power relations emerge from historical processes, dominant discourse, institutions and dominant epistemological conceptualizations. The enduring effects of gender are due to the repetition and reproduction of generally accepted patterns of behaviour. Until sex differences are disregarded and people cease to be classed into either male or female, true equality is impossible. By polarizing individuals into sex-based groupings (that is, binary opposites), this literature risks reproducing women's subordination (Calas et al. 2009).

Social constructionist feminism approaches recognize both the agency of the individual and the power relations that structures can impose.

The language used in research is important as it signifies the implicit assumptions and interpretations that researchers bring to the field of entrepreneurship (Betters-Reed et al. 2007). In the case of research on women and entrepreneurship, the language used has often been disempowering, deficit based and stereotypical (ibid). Consequently, research needs an expansion of the research object and a shift in epistemological position (Ahl 2006). Research in this line of theorizing is in its embryonic stages and researchers in this vein present largely theoretical accounts (Ahl 2002, 2006). Social constructionist feminism research initiatives look at how gender is 'done' and how aspects of entrepreneurship are gendered. The research focus is on the 'gendered nature' of ideology and institutions which concern entrepreneurship. Looking at institutional orders – business legislation, family policy, childcare, division of labour, cultural norms, support systems and *education* – and how these institutions are constructed and reconstructed (Ahl 2006) is one possible way to re-examine the trajectory of women's entrepreneurship.

Training provision for women is increasingly relied upon as a solution to rectify the imbalance in entrepreneurship activity between the sexes. However any packaged policy solution carries with it inherent (and subjective) interpretations of what the 'problem' actually is (Bacchi 1999). In the case of women's entrepreneurship, these interpretations are shaped by feminist ontology. The provision of entrepreneurship training can be approached from any one of the above theoretical positions. Foundational assumptions in all theorizing represent certain world views and not others, therefore always marginalizing some interests, concerns and activities (Calas et al. 2009). We believe that grounding feminist assumptions strongly influence the rationale, design and implementation of entrepreneurship training provision. In the following sections, we draw on a teaching model framework to help explore the ontological implications of these three feminist positions and tease out their educational-level implications.

AN ENTREPRENEURSHIP TEACHING FRAMEWORK: ONTOLOGICAL CONSIDERATIONS

Drawing on the education sciences literature (Anderson 1995; Joyce and Weil 1996; Mialaret 2005), and extending work in entrepreneurship education by Béchard and Grégoire (2005, 2007), Fayolle and Gailly (2008) have produced an entrepreneurship teaching model framework. The teaching

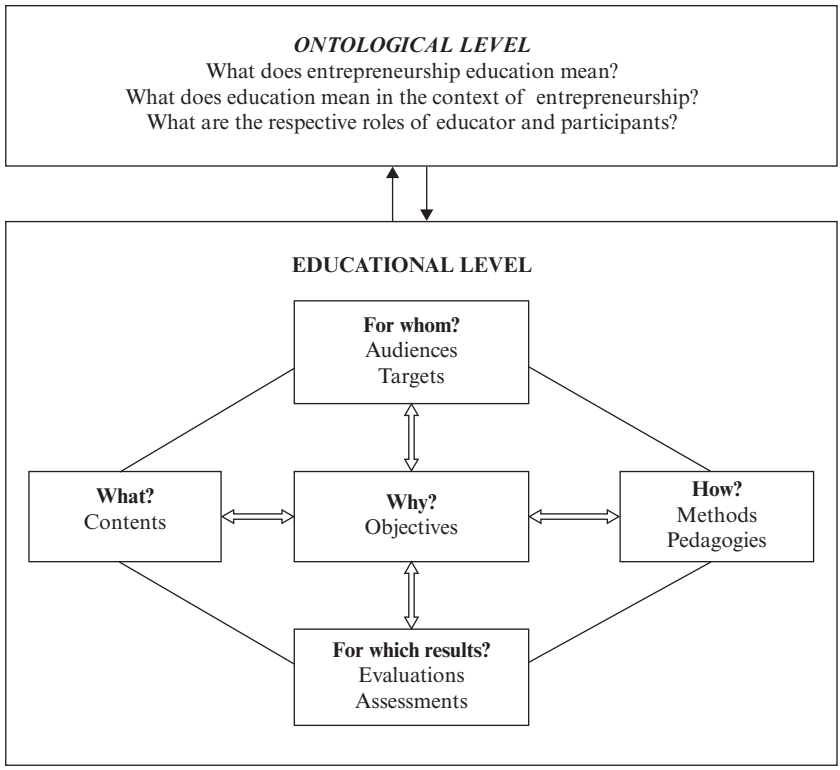

Figure 5.1 Teaching model framework for entrepreneurship education

model concept is well known in education science but rarely used in the entrepreneurship field, where no common framework or agreed good practices exist regarding how to teach or educate (Brockhaus et al. 2001; Fiet 2000a, 2000b). The framework assists in the understanding and design of entrepreneurship teaching and learning (Fayolle and Gailly 2008), as it allows for the integration of a number of dimensions which arise at the ontological and educational levels (see Figure 5.1).

The ontological level of the teaching model includes two dimensions: an explicit definition and acknowledgement of what entrepreneurship constitutes as a teaching field, as well as a definition of what 'education' implies for educators and for students within the entrepreneurship context (Fayolle and Gailly 2008). We adapt these questions to women's entrepreneurship and pose two pertinent ontological questions: (1) what does 'training' or education mean in the context of women's entrepreneurship? (2) What are the roles of educators and participants' in entrepreneurship

training for women? In trying to answer these questions, we present recent findings and recommendations from the women's entrepreneurship literature. We find that the diverse recommendations mirror the varying ontological debates in feminist theory.

What Does Training or Education Mean in the Context of Women's Entrepreneurship?

The study of entrepreneurship involves learning an innovative approach to problem solving, adapting more readily to change, becoming more self-reliant and developing creativity (Henry et al. 2005a, 2005b). Entrepreneurship education programmes can be broadly defined as any pedagogical programme focusing on entrepreneurial attitudes and skills, which involves developing certain personal qualities (Fayolle and Klandt 2006). While calls have been made to address and recognize the 'gendered nature' of entrepreneurship, the issue of gender remains largely absent from the majority of research on entrepreneurship education. As such, there is a scarcity of explicit definitions in the literature with regard to entrepreneurship training or support for women (Stranger 2004).

Authors on women's entrepreneurship often complete their analysis by referring to 'recommendations for policy makers' or by outlining the 'implications' of their findings. Here they sometimes make recommendations as to how to rectify the lower female participation rate through educational initiatives. Others refer to the futility of gender specific programmes. Often the arguments for or against entrepreneurship education relate to one's views of education on the whole. Differing views about the nature and purpose of education impact on policy formulation (Bacchi 1999). Some reformers see the role of education as one of liberation while others view it as another mode of oppression which reproduces inequality (Yates 1993). Here we see discernable differences between the modern (LF and SF) approaches and the postmodern SCF approach.

Drawing on *liberal feminist* assumptions, it is argued that training is needed to circumvent the structural barriers that women face. Structural barriers at an institutional level include vertical and horizontal occupational segregation, which impede their entry into self-employment in particular areas (Delmar and Holmquist 2003). Differences have been found with regard to owners' occupational backgrounds (for example, fewer women with engineering and technical experience). Their less relevant education may also hinder their advancement (Delmar and Holmquist 2003; Fischer et al. 1993; Stranger 2004). Carter (2000) called for the provision of training to account for skills shortages in management, marketing and sales and recruitment. Women's lower capital, their weaker financial posi-

tion and a limited use of information networks (Carter 2000; Hisrich and Brush 1984) are key problems in this regard. Access to mainstream support has been labelled 'gender-biased' due to the fact that certain industries and part-time entrepreneurs are excluded (Welter 2004). Women-owned businesses may be run from home (Brush 1992) and training workshop timing/scheduling are not always feasible (Delmar and Holmquist 2003). Thus, for the liberal feminist, education for women entrepreneurs is about liberation and equalizing the playing field. There is a need for 'women-oriented' training to 'un-do' the structural impediments to entrepreneurial activity.

Social feminist arguments tend to focus on individual-level characteristics and traits. Differences exist in men and women's motivations and approaches to business creation (Brush 1992), their leadership style and growth intentions, and thus specific courses for women are needed. Women and men use different opportunity identification processes with different stores of knowledge and pedagogical approaches must take account of this (DeTienne and Chandler 2007). Society should seek to maximize and capitalize on the potential of these differences. For example, Brush (1992) discusses women's strength in managing multi-roles and suggests that women could even teach male business owners with respect to 'coping' strategies. It is argued that women need to develop more appropriate networks and mentoring relationships, and reassign domestic work (Mirchandani 1999). Women entrepreneurs maintain they face a 'lack of respect' and feel they are 'not taken seriously' (Orser and Riding 2006; Reuber and Fischer 1999) and thus being together in the context of an educational setting allows for shared experience and solidarity. In transition economies, female entrepreneurs have been said to differ from men not only in the obstacles they face, but also in their reasons for starting a business and the factors perceived as important to success (Bliss and Garrat 2001). Thus social feminist arguments for gender-based training stem from the need to account and cater for the differences between the sexes. For some, the US system of women's business centres and their tailored information and support services can be held up as a best practice approach to encouraging female entrepreneurship (Allen et al. 2007). Through tailored programming, women's business centres pay close attention to women's interests and the reality of their lives – they customize programmes to best suit the needs of women (Allen et al. 2007). By building on women's competencies, tailored training can change the current gender imbalance in entrepreneurial activity.

Recommendations vis-à-vis gendered training provision are a little less straightforward among those subscribing to a *social constructionist feminist* view. Ahl (2006) argues that the existence of women-only

entrepreneurship programmes reproduces the idea of women entrepreneurs as secondary to men and in need of assistance, as such programmes reinforce the idea that women suffer from a 'deficit' that needs to be rectified. The foremost mechanism for the re-creation of the gender system is the categorization of people into the two categories of men and women (Ahl 2002, p. 181). Nilsson (1997) found that it was considered unfair that women got a business support service that men did not. It was not acknowledged that women suffered from different restrictions than men did. A counselling service set up just for women was found to lack 'legitimacy'. The legitimacy of 'women-only' programmes is often even questioned by women themselves. The existence of such support programmes served to reinforces the idea of the woman entrepreneur as 'the other' (Nilsson 1997).

While some theorists in the social constructionist vein acknowledge the negative effects of this 'categorization', others feel it is not yet time to remove this support structure (Marlow and Patton 2005; Tillmar 2007). In a study of another 'women-only' entrepreneurship programme in Sweden, Tillmar (2007) found that special programmes are still needed for women entrepreneurs, even in a country like Sweden which is renowned for its equality between men and women. Considerable time and energy is needed to circumvent the problems women face and they thus need help to identify the system and acquire strategies for how to handle it. Tillmar (2007) accepts the heterogeneity of women business owners but maintains that despite their differences, they have in common the fact that they also encounter disadvantages originating from the gender system in society. Indeed 'the social construction of the world of action is one of reciprocity between structure and actor so women shape their experience of entrepreneurship according to their context such that there will be different outcomes to this process, *but this remains however, subject to the structural constraints of gender discrimination*' (Marlow and Patton 2005, p. 731, our emphasis). There is still a 'need for knowledge and exchange of experience' via special programmes just for women entrepreneurs (Tillmar 2007). For SCF theorists education may be the reproduction of inequality or, ideally, it can involve the co-construction of knowledge, questioning of norms and heightened (gender) awareness. It appears that the SCF vision of conceptualization of women's entrepreneurship training is not clear cut and still underdeveloped, and has yet to provide a true unified 'practical' vision of how to rectify the imbalance.

Broadly speaking, we can identify a contrast between the modern (LF and SF) approaches to education which seek change as opposed to the postmodern (SCF) approach which seeks to 'deconstruct'. The LF and SF approaches view entrepreneurship education for women as a liberating

and equalizing force, whereas SCF approaches highlight the reproductive effects of education. An SCF approach to training provision emphasizes awareness building and exposure of the 'taken for granted'.

What Are the Roles of Educators and Participants in Females' Entrepreneurship Training?

Fayolle and Gailly (2008) advocate a vision of entrepreneurship education that both 'teaches' and 'educates', where the envisaged role of students is clear. Will the programme involve active, passive or 'co-constructor' participants? Should teachers play the role of presenter, facilitator or developer? Attention is drawn to the respective roles that teachers and 'students' can play in an entrepreneurship education setting (Béchard and Grégoire 2007). Again, there appears to be a deficit in the literature with regard to what this training constitutes. The literature indicates that training efforts for women involve both 'teaching', that is, 'imparting knowledge' on business plan formulation, and 'educating', that is, 'refining notions' of entrepreneurship as a traditional male domain. While some researchers advocate mentoring or business coaching (Carter 2000), others emphasize information provision, advice and knowledge (Bliss and Garratt 2001). However, research has yet to reveal significant and compelling insight into the common perceptions of educators' roles as well as the comparative use and value of different approaches. This will be further explored when addressing the 'how' and 'for which results' questions at the educational level.

Intuitively, potential participants are usually (female) adults either engaged in running their own business or thinking about doing so (nascent entrepreneurs). Following Malcolm Knowles, the founding father of adult education, adult learners are viewed as 'self-directing' individuals with rich life experiences to draw on (Knowles 1984). They often exhibit a certain level of 'competitiveness' developed from young school experiences. In light of this, one would assume that a climate of collaboration should be encouraged in this training context. However, the 'student' in entrepreneurship training programmes can be perceived as an active or passive participant. They may be seen as needing assistance due to their disadvantaged position (see Allen et al. 2007; Bliss and Garratt 2001). In some instances, classroom interaction can allow them to effectively 'co-construct' the knowledge they receive (Fayolle and Gailly 2008). The role of the teacher may be more of a facilitator or tutor than didactic teacher and sometimes that role may also be that of coach (Béchard and Grégoire 2007), such as in the case of peer-mentoring. Peer-mentoring is considered a particularly valuable form of entrepreneurial training used for women

(Carter 2000). This allows women to share experiences with other women entrepreneurs as role models, which is of primary importance. Tillmar (2007) felt that the educator should play the role of 'coach' as coaching is a good method in that it allows personalization to individuals' needs. Further research revealing the conceptualization of 'roles' by participant and facilitator certainly would be insightful here. Liberal feminist ideals of overcoming barriers and obstacles may relate more to imparting knowledge and information (teaching) while a social feminist viewpoint leans more towards the concept of personal development and nurturing (coaching). Social constructionists are strongly in favour of the co-construction of knowledge but research is scarce with respect to concrete types of 'gender' sensitive training.

Ontological assumptions bear an unquestionable impact on programme design and delivery. Thus educational level dimensions are discussed in the subsequent section.

WOMEN'S ENTREPRENEURSHIP TRAINING: EDUCATIONAL-LEVEL QUESTIONS

As part of their entrepreneurship teaching framework, Fayolle and Gailly (2008) propose that the architecture of education programmes should be based around five specific interrelated questions:

1. Why (objectives, goals)?
2. For whom (targets, audiences)?
3. What (contents, theories)?
4. How (methods, pedagogies)?
5. For which results (evaluations, assessments)?

Why?

The 'why' of an entrepreneurship training programme addresses the desired outcomes. The implicit feminist assumptions discussed earlier clearly influence the goals and objectives of entrepreneurship training providers. These outcomes may be at the individual or societal level. At an individual level, entrepreneurship training is envisaged as overcoming some of the 'deficits' in experience or education that women exhibit (liberal feminist), or they attempt to rectify characteristics such as lower risk-taking propensity, lower entrepreneurial self-efficacy, misguided self-perceptions (social feminist). Negative self-perceptions have been found to characterize – and possibly hinder women entrepreneurs (Minniti and

Nandone 2007; Shragg et al. 1992). Thus targeted training programmes can address their lower self-esteem and confidence levels (Roomi 2005), their lower entrepreneurial self-efficacy (Wilson et al. 2007); their differing risk-taking propensities (Carland et al. 2005) or their 'entrepreneurial self-image' (Verheul et al. 2005). Women should avail themselves of opportunities to build 'girls networks' (Hisrich and Peters 1989).

At a societal level, arguments for the implementation of women specific training programmes follow the line of economic development. The value of SMEs is so great to national economies, that women are considered as a source of entrepreneurial talent still to be fully exploited. The economic perspective proposes that a nation should engage in entrepreneurship education and training because it is critical in promoting long-term employment and economic growth, which is key to attracting foreign investment and can help a country gain a competitive advantage. It also is said to maintain the absorptive capacity of innovative firms and provides a source of wealth creation to a company. Despite the efforts of some authors to integrate feminist perspectives on women and entrepreneurship, the mainstream debate focalizes on economic progress rather than equality of the sexes. However, gender based assistance programmes can be seen as a way to empower women (socially) to manage their lives within the new economy (Servon 1996).

For Whom?

According to Orser and Riding (2006), target markets include at least three categories of participants: (1) nascent women business owners, (2) women business owners of start-up firms and (3) growth-oriented women business owners. Most support for women entrepreneurs today addresses the second category, that of existing start-ups, either through specific programmes directed at women only or through the overall support structures for start-ups (Welter 2004).

Carter (2000), however, calls for recognition of the heterogeneous experiences of women and their different needs. A number of recent studies stress the importance of educational, social and cultural issues in designing training programmes (De Faoite et al. 2004). Specific programmes for women entrepreneur 'sub-groups' have been studied in this regard. Entrepreneurship programmes may exist for women who are deemed particularly marginalized, for example, black women (Dolinsky and Caputo 1994), low income and welfare mothers (Ehlers and Main 1998) or isolated rural women (Simpson et al. 2002). The Women Business Centre network in the USA specifically targets women who are 'economically or socially disadvantaged'. Wilson et al. (2007) believe it is advisable to ensure the

delivery of entrepreneurship training to a wider audience of women with diverse socio-economic and racial/ethnic identities and that entrepreneurship training should be provided at as early an age as possible.

Both country and societal contexts play a strong role in determining the entrepreneurial inclination and success of women (Minniti et al. 2005). Clearly, the case for a women-only entrepreneurship training programme in Pakistan (see Roomi and Harrison 2008) cannot be compared with the need for women-only entrepreneurship programmes in France. The 'for whom' issue cannot be assessed without consideration of the social and cultural context.

What (Contents, Theories)?

It is observed that gender differences and structural inequities exist at many levels – personal, individual, organizational and institutional (Brush et al. 2002; Orser 2007). Thus, content may be derived from these various disparities. Differences in the nature of women owned-enterprises, that is, the existence of 'female' industry sectors and smaller than average business size (Evans and Leighton 1989) should influence programme content. Predictably, the type of assistance provided varies with the stage of business development (Stranger 2004). Nascent entrepreneurs may require one form of support while more established entrepreneurs may need assistance in growing their business or in managing its growth. There is a clear demand for enterprise programmes designed and geared toward growing women owned businesses (Aylward et al. 2006). The use of teaching materials that feature women entrepreneurs in a greater variety of industries and with high growth aspirations are perhaps needed (Brush et al. 2002). This is said to serve to expand the horizons and stimulate aspirations of female students but it may also broaden the perspectives of male colleagues who could constitute a future spouse, banker, investor or employee.

Essentially, researchers conclude that the 'what' of entrepreneurship training for women should address their individual 'deficits' in specific areas. The importance of up-skilling women in marketing strategy and business planning (Bliss and Garratt 2001) or improving women's self-confidence and opportunity recognition (Allen et al. 2007) influence content. Women often indicate they require training and assistance in financial management and financing (Stranger 2004), exhibiting a greater interest in attending seminars in a number of areas including accounting, compared with men (Welsch and Young 1984). Some researchers allude to the specific information needs of women entrepreneurs. Barrett (1995), for example, found that significantly more women sought advice on government or legal paperwork and asked a wider variety of people for this

type of information. In terms of the value business owners ascribe to the learning experience made available to them, women find many sources of business learning more useful than men (Barrett 1995).

How (Methods, Pedagogies)?

Entrepreneurial training and support initiatives may be both formal (that is, structured training) and non-formal (De Faoite et al. 2004). Courses typically include structured training and informal support. Structured training usually focuses on developing technical skills, business management skills and personal entrepreneurial skills (Hisrich and Peters 1989) with financial management, marketing and management knowledge (De Faoite et al. 2004). But how should these formal 'skills' and 'knowledge' be imparted? Informal supports for women entrepreneurs including mentoring, business counselling, financing and networking opportunities are other ways of delivering support. Mentoring is highly recommended as a support mechanism for women entrepreneurs (Carter 2000; Tillmar 2007). Mention is also given to course timing and duration. Women's training and assistance should take women's typical daily lives into account for training provision and design (Allen et al. 2007; Delmar and Holmquist 2003). Programme organizers should avoid, for example, scheduling two-week intensive full-time courses which may not fit in with family commitments (Watkins and Watkins 1984). There is a considerable lack of research with regard to the methods and pedagogies of trainers specifically involved in women entrepreneurship training. To what extent are real-life or virtual cases, role plays and problem simulations used in such training? Are teaching approaches participative or interactive? To what extent is learning by doing encouraged? Clearly, there are many pertinent methodology and pedagogical style questions yet to be answered.

For Which Results (Evaluations, Assessments)?

Sheikh and Steiber (2002, p. 3) define evaluation as 'the judgment of a (public) intervention according to its results, its impacts and the needs it intends to satisfy'. Unfortunately, the nature and impact of gender-based small business programmes is not well documented (Orser and Riding 2006). Thus, while public policy attempts to address the imbalance between male and female entrepreneurs – both in terms of relative participation and relative performance – it is not clear which approaches have been effective (Orser and Riding 2006). Those studies that have been carried out vary in focus and utilize divergent yardsticks of measurement. For Sheikh and Steiber (2002), an evaluation of an SME programme

targeted to women's needs has to address 'the relevance of the program in relation to the needs of its potential beneficiaries'. Given that there is a lack of consensus on these needs, it is perhaps no wonder that evaluation efforts are not well advanced. Some studies which have tried to address the outcomes of women only entrepreneurship training are presented below.

Dumas (2001) concluded that enterprise training helped participants achieve economic self-sufficiency, build strong businesses and develop life management skills. Research suggests that entrepreneurship training programmes for women should explicitly include the objective of building self-efficacy (Peterman and Kennedy 2003) and thus accordingly the assessment of programme impact may encompass this variable.

In terms of results, one can also think of unwanted outcomes. Walker and Joyner (1999) concluded that a business support programme could be both a solution to and source of discrimination. They referred to the resentment that can be felt towards such gender-specific targeted assistance. Their article explored the theoretical aspects of gender-based public policy programmes, that is, programmes that are specifically designed to increase the number of women willing and able to start a business. They investigated the economic impact of these programmes on entrepreneurship and the market process (resource allocation) in general, arguing that little evidence exists to support gender specific programmes. Furthermore, gender-specific programming can lead to pure gender discrimination arising from resentment of the preferential treatment given to women when the resources could be used elsewhere (Walker and Joyner 1999). There are concerns that women-only based training and assistance reinforce this industrial segregation and channel women into small, home-based, under-capitalized and labour-intensive business areas (Brush et al. 2002). The business that a woman enters is not decided by choice, as business sectors and entrepreneurship itself are gendered (Ahl 2002). Gender specific support may perpetuate this 'gendering' of business sectors. Programmes which focus on the personal development of individuals (perhaps in an attempt to change self-perceptions) can be seen to reinforce segregation and perpetuate the economic peripheralization of women (Ehlers and Main 1998).

Implications

The above discussion leads us to the development of three different ways of conceptualizing women's entrepreneurship training, the rationale for its existence (or not) and the implications of these ontological starting points for education design, implementation and practice. Training may be a way to circumvent obstacles and discrimination (liberal feminism), or a way

to address women's unique entrepreneurial capabilities (social feminism). For social constructionist feminists, the value of women-only entrepreneurship training is questionable as it is felt it further reinforces their subordination (Ahl 2002) or undermines their legitimacy (Nilson 1997); however, it may still be necessary due to the common discrimination that women face (Tillmar 2007). These different conceptualizations of what women's entrepreneurship training is about in turn impact on educational design. The 'world-views' of the educator strongly determine their idea of who they are teaching, their role as teacher, why they are teaching, the things that they should teach, the way that they should do this and what they think they are trying to achieve. In Table 5.1, we present the resulting three 'schools' of thought (and practice) which may arise.

We hasten to add that we do not see these three models as rigid and fixed but rather as a reflection of the dominant thinking in the literature to date. Thus, while liberal feminist views of education and its role for women entrepreneurs may be largely about the 'transmission' of knowledge, we also accept that entrepreneurship trainers adopting a social feminist stance may also exhibit these roles. Equally, while we have outlined 'coaching' as being a teaching technique very much in line with social constructionist ideals, we do not exclude the possibility of its practice in training programmes underpinned by different feminist ideologies.

CONCLUSIONS

Research on gender-based business training, while not abundant, can be situated in the larger field of women's entrepreneurship; in other words, an underdeveloped literature field with contradictory findings. Some authors reveal study results indicating no gender difference, while others argue that female entrepreneurs experience a number of problems and issues that are greater than those facing small businesses in general. Overall, an important shortcoming in the research to date is the lack of a consolidated perspective. While some literature reviews have tried to accumulate findings of prior studies (Carter 2000; Stranger 2004), the body of literature remains disjointed. Current research on female-only entrepreneurship training pursues divergent investigations without any explicit acknowledgement of key ontological issues (that is, feminist ideology) and often fails to answer key educational questions.

Feminist research should not only seek to contribute to a field of research but it should also strive to challenge and overturn traditional views of women, men and human society (Patai 1990). It should also challenge those social structures that legitimize and perpetuate these views

Table 5.1 Feminist assumptions and women's entrepreneurship training (WET)

Ideological standpoint	Liberal feminist	Social feminist	Social constructionist feminist
Ontological level assumptions			
What is it?	WET is about helping women identify and overcome structural barriers and discrimination Women and men are just as 'able' to be entrepreneurs	Women and men have different approaches to entrepreneurship. WET is about capitalizing and developing women's unique ways of doing business (and can help address their 'shortcomings' vis-à-vis their male counterparts)	WET serves to reinforce the secondary and insubordinate nature of female entrepreneurs Or WET may still be necessary to deal with the common problems women face
What does education mean?	Education is about the transmission of knowledge and information. It can act as a liberating/equalizing force	Education as an equalizer – equality in difference. It involves nurturing and enhancement of skills, as well as personal development	Education can serve to reproduce existing inequalities. Effective education is about the co-construction of knowledge, questioning of norms and introducing gender awareness into the mainstream
What are the respective roles?	Educator as 'helper' or 'decoder', student as relatively passive 'recipient'	Educator as 'developer', student as 'active recipient'	Educator as facilitator and coach: student and teacher 'co-construct their knowledge'

Educational level implications			
What	Transmitting skills and capabilities, provision of tools, i.e. information re: acquiring capital, accessing networks, overcome skill shortage in key skills, i.e. finance	Transmitting skills and capabilities, i.e. networking Personal development, i.e. boosting self-confidence and personal efficacy Tailored to women's needs, fits in with women's 'timetables'	Entrepreneurial experiences and accounts Expose to stories and narratives of others, interpretation of situations and case histories
Why	Eradicate barriers, overcome discrimination	Develop potential, build on shortcomings	Avoid perpetuating 'secondary-ness' of woman entrepreneurs
How	Information/advisory services, in-class training, tuition, encourage networks	Traditional class, peer networks for support, discussion groups, role play	Coaching that is tailored to individual, experimental teaching approach (learn through doing)
Whom	Woman entrepreneur seeking to gain equal access to resources/markets	Woman entrepreneur seeking to build on own unique capabilities, trying to fit entrepreneurial 'career' within her life	Future oriented entrepreneur, who 'happens' to be a woman and seeks legitimacy in own right
Which results	Increase number of women entrepreneurs 'able' to function	Equal number of women 'willing' to take on entrepreneurship as a career	Deconstruct stereotypes and broad generalizations, build own individual learning lessons

(Ahl 2002). Those arguing for training on the basis of essential differences between male and female entrepreneurs may be said to reflect social feminist assumptions (that is, the two sexes are essentially different, these differences have their own unique value and should be celebrated). Research calling for gender-streamed entrepreneurship training in order to circumvent structural barriers (social, financial and human capital based) which only women face may be said to reflect liberal feminist assumptions. Liberal feminism advocates that action be taken to eradicate these barriers so that women can perform similarly to men. Thus, training is seen as a way to circumvent obstacles and/or 'fix' those entrepreneurial deficits from which women suffer. Training is designed to meet these particular 'learning' needs. The LF focus on structural barriers means that it is the woman – not the structures – which need to change (Ahl 2006; Mirchandani 1999). The liberal approach fails to address socialization issues and persistent stereotypes which devalue women or the continuing inequality in the distribution of domestic and caring labour (Marlow and Patton 2005).The social feminist focus on socialization as an explanation for all differences between male and female entrepreneurs provides a partial and highly individualistic analysis of gender differences. What about additional bases of stratification such as race, ethnicity and class (Mirchandani 1999)? It also fails to highlight how certain structures create, support and perpetuate these gender differences as opposed to merely reflecting the orientations of 'socialized' individuals (Mirchandani 1999). While there is good reason to pursue comparative research, sex and gender differences as the standard of comparison need not be the only standard (De Bruin et al. 2007).

Clearly SF and LF influenced researchers present a clear rationale for women only entrepreneurship training. However, another dominant train of thought questions the rationale of gender-streamed entrepreneurship training. Social constructionist feminism theorists reject the assumed difference between the two sexes. Some go so far as to say that the categorization of male and female entrepreneurs is futile (Ahl 2002, 2006) and that single-sex training programmes are thus inappropriate. Another argument in the same line classifies such female-only training programmes as counter-productive in that their legitimacy is questionable (Nilsson 1997). It is instead recommended that mainstream assistance programmes be more attentive to gender in order to negate this institutional discrimination (Ahwireng-Obeng 1993). Others writing in the same vein (Marlow and Patton 2005; Tillmar 2007) feel that gendered assistance is still required as women are constrained by common societal stereotypes and biases.

This framing of the women-only entrepreneurship training has allowed us to have an overall 'snapshot' of progress in the field while also illuminating areas for future research. While most research on female

entrepreneurship is not based on feminist theories (Mirchandani 1999), implicit theoretical assumptions of difference underpin much of the literature (Ahl 2002; Fischer et al. 1993) and ultimately influence key educational level decisions. Ontological questions force practitioners, academics and policy makers alike to really consider the feminist ideology they wish to subscribe to. This may influence their decision whether to implement women-only programmes or not, as well as inform their understanding of what education and training can hope to achieve in this domain. An analysis of educational issues in women's entrepreneurship has shown that there is a considerable lack of research in particular areas, that is, the 'how' of women's entrepreneurship teaching, as well as demonstrating the lack of theoretical consensus or theory development in others, that is, the 'what' of women's entrepreneurship training. The 'for which results' question has not been adequately addressed and the 'for who' question needs further refining.

In summary, we feel that applying an educational science approach to the question of entrepreneurship training for women yields some interesting insights into the field and highlights areas which warrant further research attention or lack theoretical coherence and consensus. Most importantly, the typologies presented illuminate the striking impact of inherent and often implicit assumptions on programme rationale, content, participants, delivery and outcomes.

NOTE

1. It was largely through SF writings that the distinction between 'sex' and 'gender' was established. The idea of gender as a reference point was considered much more useful on the basis that social gender could be changed while biological sex could not (Reddock 2000). A person's sex is characterized by the physiological differences that make them either female or male, whereas a person's gender is based on differences in social experience which begin from birth (Fischer et al. 1993). In this chapter, we use the terms 'female' and 'woman' interchangeably.

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6. Knowledge and experience in the internationalization of knowledge-intensive firms

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INTRODUCTION

Our understanding of the role of knowledge and experience in internationalization is twofold. First, there are a significant number of studies in the field of entrepreneurship, in which this theme is addressed, particularly from the experiential perspective. Indeed, several studies have shown that entrepreneurs who have been involved in earlier entrepreneurial activities are generally able to manage a new start-up more effectively (see, for example, Alsos and Kolvereid 1998; Iacobucci and Rosa 2003; Westhead and Wright 1998; Westhead et al. 2003). In other words, the level of experience is positively associated with the performance of the firm, that is, the longer the experience, the better the performance. This is in line with the prevalent line of thinking according to which previous entrepreneurial experience could be considered an essential form of entrepreneurial learning (Sullivan 2000), and may result in the more efficient processing of information and the better identification and innovative exploitation of new business opportunities (Ucbasaran et al. 2009).

Secondly, knowledge and other types of experience have also been associated with the internationalization of entrepreneurial firms. Johanson and Vahlne (1977) in their seminal paper on the internationalization of the firm pointed out that market knowledge was a decisive element. The underlying thought in their process model was that the more experience of international operations the company accumulated and the higher the number of markets, the more internationalized it would become. This research tradition also highlights the importance of experiential learning among key decision makers. This involves learning about external elements such

as foreign markets and institutions, and also about the internal resources of the firm and its capabilities in new and unfamiliar conditions (Eriksson et al. 1997).

However, these two research streams have not converged, and although there is growing recognition of heterogeneity among entrepreneurs with respect to opportunity recognition (Ucbasaran et al. 2003a, 2009), only a few studies focus on the impact of prior entrepreneurial experience on the internationalization process of the ventures (Presutti et al. 2008 is one recent exception). Our aim in this chapter is to empirically examine whether and how prior experience influences the internationalization of the firm. Are there differences to be found between habitual and novice entrepreneurial firms, for example?

We consider company internationalization from various angles, with a particular focus on speed and intensity. The rapid internationalization of entrepreneurial firms has become increasingly prevalent as a phenomenon in recent decades (cf. Keupp and Gassmann 2009; Gamboa and Brouthers 2008), and more and more firms in knowledge-intensive industries such as software and the life sciences in particular seem to adopt an international if not a global focus from the start. The antecedents of this accelerated process have been rather well documented in the literature, and its most common triggering factors appear to be the following (Madsen and Servais 1997; Rialp et al. 2005): (1) the new market conditions in many sectors of economic activity (including the increasing importance of niche markets for small and medium-sized enterprises [SMEs] worldwide); (2) technological developments in the areas of production, transportation and communication; (3) the increased importance of global networks and alliances; and (4) the enhanced capabilities of people, including those of the founder/entrepreneur who starts early internationalizing firms. Our objective in this study is to elaborate on the last point as there seems to be a call for more understanding of the role that prior knowledge and experience play in the rapid internationalization of entrepreneurial firms (Reuber and Fischer 1999).

Knowledge-intensive firms were selected as the focus of this study because in their case the role of prior experience is decisive: rapid international growth could be considered a necessity and not a strategic choice (cf. Brennan and Garvey 2009). Preece et al. (1999) distinguish three main drivers of rapid international growth in technology-based firms. First, SMEs in high-technology sectors frequently operate within a narrowly defined market niche: specialization necessitates international expansion if the aim is to achieve sales growth. Secondly, these firms are facing high research and development (R&D) costs, which often come 'front-end', in other words before any sales have been made. In order to survive they

have to get onto the growth track quickly so that they can support these initial expenses. Thirdly, the competition is very intense and products become obsolete rather quickly: if the company is to take full advantage of the market potential it has to penetrate many markets simultaneously. Consequently, there is seldom the time for experiential learning and companies have to acquire the necessary knowledge in other ways, possibly by utilizing their prior experience.

The chapter continues with a review of the relevant literature, which culminates in a summary model of the impact of knowledge and experience. The research design and data collection and analysis are described thereafter, and then we report the findings of our analysis. Finally, conclusions are drawn and we offer suggestions for future research.

LITERATURE REVIEW

Entrepreneurial Experience as a Point of Departure

Entrepreneurship could be defined as an act of market entry whereby the entrepreneurial manager in the firm has to decide which markets to enter, when and how (Lumpkin and Dess 1996). Alternatively, it could be described as the identification and pursuit of opportunity regardless of the firm's current resources (Stevenson and Jarillo 1990). Both definitions are applicable in analysing the internationalization of entrepreneurial firms.

Entrepreneurship research has addressed the role of experience, the main interest being in the impact of entrepreneurial experience on company performance. These studies give various labels to entrepreneurs, which are often used interchangeably. As early as in the 1980s Ronstadt (1982) introduced the concept of 'habitual' entrepreneur, that is, a person who starts up multiple companies, and this was later separated into serial and portfolio (or parallel) entrepreneurs, depending on whether their involvement in various businesses was simultaneous or sequential (for example, McGaughey 2007a; Rosa 1998; Ucbasaran et al. 2006).

Habitual entrepreneurs are of global significance in that more than every fourth entrepreneur has experienced multiple start-ups (Stenholm et al. 2008). Therefore it is not surprising that it is a phenomenon of interest in empirical studies, in which these experienced business founders have been compared with first-time (also called novice or nascent) entrepreneurs. The main question in earlier studies has been whether the more experienced entrepreneurs have an advantage over others and, if so, why (Iacobucci and Rosa 2004)? The findings indicate that habitual entrepreneurs do differ in terms of both attitude and behaviour (Alsos

and Kolvereid 1998; Westhead et al. 2003; Ucbasaran et al. 2006), but not necessarily in performance (Birley and Westhead 1994). However, they do not comprise a homogenous group, and differences between serial and portfolio entrepreneurs, for example, have been identified (Rosa 1998; Ucbasaran et al. 2003b, 2006). This heterogeneity probably also partly explains the contradictory findings in earlier research (cf. Politis 2008).

The focus in our study was on different types of entrepreneurs with varying prior experience, who are assumed to select diverse internationalization strategies. There seems to be an increasing awareness of the need for a better understanding of these processes and strategies. As Westhead (2008) and Westhead et al. (2001) suggest, some firms have neither the inclination nor the ability to internationalize. Our pre-assumption is that previous entrepreneurial experience should foster both the inclination and the ability. We are therefore looking in particular at the differences between the internationalization strategies selected by habitual versus novice entrepreneurs and entrepreneurs with previous international experience versus those with no such prior knowledge. In line with Ronstadt (1982), and Birley and Westhead (1994), we do not consider entrepreneurship a single-event action, and suggest that the phenomenon of the habitual founder (an entrepreneur starting several businesses) is also worth studying in the context of international entrepreneurship.

Knowledge-related Challenges

One of the greatest challenges in internationalization is the limited knowledge resources the entrepreneurs and managers possess. Experience in running a business and of operating in foreign markets is among the necessary resources, particularly in small and medium-sized entrepreneurial enterprises in which knowledge accumulation and experiential learning are considered prerequisites (Eriksson et al 1997; Johanson and Vahlne 1977; Oviatt and McDougall 1994; Sapienza et al. 2006). Among the most commonly discussed challenges to internationalizing firms are the *liability of newness* and the *liability of foreignness* (for example Autio et al. 2005; Dunning 1981; Stinchcombe 1965; Zaheer 1995), as well as *psychic distance* (for example, Johanson and Vahlne 1990).

The liability of newness is generally related to young or newly established firms, when the entrepreneurs do not yet have experience in running the business (cf. Stinchcombe 1965). This concept could also be extended to firms in which the entrepreneurs do not have earlier experience of operating on a target market, being newcomers there. The question of how habitual and novice entrepreneurs differ in terms of liability of newness is not a well-researched area (Politis 2008), and the existing findings are

somewhat contradictory. For example, Autio et al. (2000) argue that new firms in particular have a 'learning advantage of newness' in that they do not have any history-laden routines or institutionalized ways of thinking that would prevent them from adapting and competing in the global environment. However, Shepherd et al. (2000) found that habitual entrepreneurs coped better with liabilities of newness than novices.

The liability of foreignness, then, applies to entrepreneurs who do not have earlier experience of operating in a foreign target country, having operated in other countries or only on the domestic market, and the knowledge they already possess is not readily transferable to the new foreign market (cf. Zaheer 1995). According to Johanson and Vahlne (1990), SMEs often face these challenges in combination. They can be overcome, however, through learning about and experiencing 'foreign organizing knowledge' (Johanson and Vahlne 1977), which covers, among others things, understanding about doing business, about institutions and target-market characteristics, and about target-market customer needs and preferences.

Psychic distance (cf. Johanson and Vahlne 1990) resembles the liability of foreignness in many ways. Both concepts concern the differences between domestic and foreign markets. These differences create challenges for internationalizing firms, which need to acknowledge and cope with variation in culture, language, political systems, religion, legislation, norms and tastes, all of which disturb the flow of information between the firm and the market. This makes it challenging, first, to enter the market, secondly to establish business relationships with local actors, and thirdly to make and keep the foreign business operations profitable. Markets in general are characterized by asymmetric information between the firm and its customers, competitors and suppliers. In the international context this asymmetry expands to the level of different country markets (cf. Kirzner 1973). Psychic distance has also been considered to influence the choice of target markets (Ojala 2008; Ojala and Tyrväinen 2009), and prior knowledge and work experience have been found to reduce the psychic distance from a specific market (Chetty and Campbell-Hunt 2004).

It has traditionally been assumed that entrepreneurs who do not possess broad experiential market knowledge (Penrose 1959) concentrate their internationalization efforts on countries that are culturally similar and geographically close to their home country. When experiential market knowledge accumulates through learning and running the business, the entrepreneur may start to operate in countries that are psychically more distant, in other words they are culturally and geographically more distant from the home country. However, this idea of a sequence starting from close countries and proceeding to more distant ones during the

internationalization process has attracted criticism, and several studies have reported contradictory results (for example, Ellis 2008). This has been particularly highlighted in the context of early internationalizing firms in which foreign-market knowledge tends to emanate from the innovative and proactive pursuit of entrepreneurial opportunities across national borders, rather than through the incremental acquisition of experience in foreign markets (Zhou 2007).

Rather than concentrating on differences, entrepreneurs evaluate the attractiveness of different countries based on the knowledge and experience they have about them in relation to the opportunities embedded in the markets (cf. Ojala and Tyrväinen 2009). If current knowledge and experience are scarce, the expected risks related to the country are high, and the exploitation potential is uncertain, they might concentrate on countries that are low in psychic distance. Then again, if they have prior experiential market knowledge and international experience, consider the possible risks to be tolerable, and feel that the opportunity is worthwhile they might expand to countries that are psychically more distant (cf. Ojala 2008). This development is particularly visible in born-globals (Gabrielsson and Kirpalani 2004; Madsen and Servais 1997).

Knowledge and Experience in the Context of Rapid Internationalization

Traditional internationalization process theories (Bilkey and Tesar 1977; Johanson and Vahlne 1977; Johanson and Wiedersheim-Paul 1975; Luostarinen 1979) rest on the assumption that firms have imperfect access to information, and explain internationalization as a process of knowledge acquisition. Furthermore, they posit that knowledge of the market, the customers, the problems and the opportunities abroad are acquired through operating on the international market. It is then further utilized for building routines and developing networks, particularly in the early stages of the process (Blomstermo et al. 2004).

Knowledge has been classified as objective or experiential (cf. Penrose 1959). As Eriksson et al. (1997) point out, objective knowledge is acquired through the standardized collecting and transmitting of information, such as conducting market research, and is easily transferred to other countries and replicated by other firms. However, a criticism of the process model is that objective knowledge seems to be of lower importance in a firm's internationalization (Eriksson et al 1997). What is seen as the most essential ingredient and driver of international activity is experiential knowledge (Johanson and Vahlne 1977; Westhead 2008), which is considered highly situation- and country-specific and non-transferable across firms or business units (cf. Chetty et al. 2006). Because knowledge is collected and

stored by individuals, it will also be filtered and affected by their personality and background before it accumulates to the stock of knowledge of the firm (cf. McGaughey 2002; Petersen et al. 2003).

The role of earlier international experience has also attracted an increasing amount of attention in the literature on international new ventures and born-globals, and some of the prevailing assumptions have been challenged (for example, Brennan and Garvey 2009). We know that people with previous experience in international professions are likely to be more aware of the challenges and also of the profit opportunities than those who do not have such experience (Bloodgood et al. 1996). In other words, these managers have been able to learn from previous exposure and can add their new knowledge to these accumulated experiences (Eriksson et al. 1997). Roberts and Senturia (1996) found that none of the top managers of the firms in their US sample had direct international experience from having lived abroad, although the majority had someone in the management team who had worked previously in or with a company that did substantial business in global markets. Autio et al. (2000) reported contrary findings in their study on international growth in entrepreneurial firms, concluding that years of international experience had no effect. Despite their contradictory elements, these findings indicate that prior international experience may have an influence on the internationalization of the firm. Thus, we propose the following:

Proposition 1: Prior international work experience in the entrepreneurial team has a positive impact on company internationalization.

However, the existing literature on international entrepreneurship offers much less information about the role of prior entrepreneurial, or start-up, experience in internationalization. Its role in the success of new companies has been studied rather widely, but for the most part among domestic ventures. It appears that prior experience provides tacit knowledge that facilitates decision-making about entrepreneurial opportunities under conditions of uncertainty and time pressure (Johannisson et al. 1998; Sarasvathy 2001). Thus, people with prior experience should see more potential in a particular opportunity than others, and thus be more likely to exploit it (Shane 2003). Many empirical studies offer support for this 'learning by doing' argument. It has been shown, for example, that prior entrepreneurial experience improves the economic performance of new ventures, suggesting that a new venture whose founders have more prior experience generate more income from their businesses (cf. Westhead et al. 2003). Moreover, prior experience (for example, in the form of

relevant business skills, well-developed networks and a good reputation) is assumed to provide knowledge that enables an entrepreneur to overcome the 'liabilities of newness' that new ventures typically face. Several authors have pointed out that although some of the information and knowledge can be acquired through education, for example, much of what is required about exploiting opportunities and coping with the liabilities can only be learned 'hands-on', by doing. (Cope and Watts 2000; Rae 2000; Shane 2003)

On the basis of the above discussion it seems fair to argue that two particular outcomes emanate from the entrepreneur's preceding learning and experience: (1) an enhanced capability to cope with the liability of newness, and (2) an enhanced capability to cope with the liability of foreignness. Therefore, we propose that

Proposition 2: Prior entrepreneurial experience in the entrepreneurial team has a positive impact on the company's internationalization.

As pointed out above, internationalization is a process of knowledge acquisition, and there are several ways of obtaining relevant knowledge. It is commonly accepted that experiential knowledge cannot be transmitted (cf. Penrose 1959), but objective knowledge can (Eriksson et al. 1997). However, in the context of internationalization, other dimensions of knowledge acquisition, such as organizational learning, also have to be taken into consideration. As Forsgren (2002) points out, companies may collect valuable knowledge by learning through their business relationships and networks, imitating best practices, or searching for focused information. They could also create a 'short-cut' to relevant knowledge through the acquisition or recruitment of knowledgeable people (Forsgren 2002). These people may possess valuable experiential knowledge through having worked abroad, but also through having received education in foreign countries. Earlier studies on small-business internationalization have indicated that education is a significant driver of an international orientation (see, for example, Dichtl et al. 1984, 1990; Holzmüller and Kasper 1990), and its role cannot be underestimated. Lengthier exposure to foreign cultures and environments – even as a student – will also facilitate adaptation to foreign business environments. Therefore we also propose that

Proposition 3: Having someone with an international education in the entrepreneurial team has a positive impact on the company's internationalization.

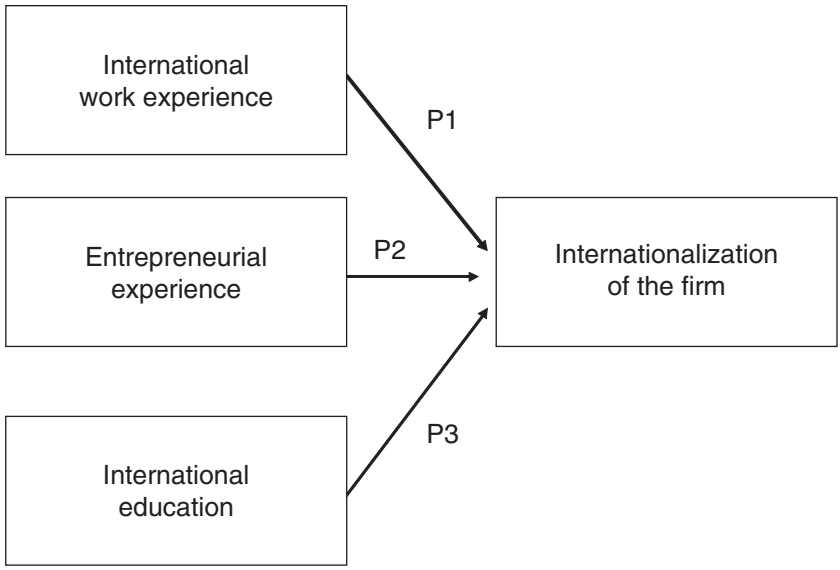

Figure 6.1 The research setting of the study

In sum, this study explores the impact of international experience, entrepreneurial experience and education on company internationalization. The research setting is illustrated in Figure 6.1.

The internationalization of the firm is understood broadly, and both attitudinal and behavioural measures are used to analyse its dimensions. The measures and methods used are described in detail in the following section.

METHODS

Data Collection

We chose the dynamic and technology-driven information and communication technology (ICT) industry as our context in the empirical part of our study, as it fits well with our definition of a knowledge-intensive industry and faces the challenges of rapid internationalization as described above. The population of interest was defined as small and medium-sized Finnish companies providing value-added services in the ICT sector, including in particular content and software providers for service-platform and management systems. A total of 493 companies were identified, and contacted

by telephone. At this stage 34 companies were found ineligible, and 74 refused to participate in the study. The 385 companies that agreed to participate received an email message the following day containing instructions for answering the web-based questionnaire. A reminder message was sent to those who had not sent their response within two weeks. Of this sample, 123 companies returned the questionnaire, resulting in an effective response rate of 26.8 per cent (123/459) of the eligible target population. This could be considered satisfactory given the length of the questionnaire and the fact that the respondents were mainly chief executive officers (CEOs) or managing directors with busy time schedules.

Several measures were taken to ensure the validity and reliability of the results. For example, the questionnaire was carefully pre-tested in a number of firms. Furthermore, it was targeted at CEOs and managing directors, who are considered the most knowledgeable informants regarding internationalization issues in SMEs. A comparison of the early and late respondents (the late respondents being assumed to be similar to non-respondents) was conducted in order to assess non-response bias (cf. Armstrong and Overton 1977). No significant differences in the distributions of the basic demographics (age, turnover and personnel) were found between these two groups, and non-response bias was therefore not expected to have an effect on the results.

On average, the turnover of the responding companies was 2.03 million euros, the median turnover value demonstrating that in 50 per cent of them it was equal to or less than 0.44 million euros. There were even some companies that were so young that they had no sales at the time of the data collection. Their smallness is also reflected in the number of employees: 50 per cent employed ten or fewer full-time workers. They had been established between 1954 and 2001, but the median year of establishment was 1996, indicating that the study participants were actually quite young. Nevertheless, the majority (58 per cent) had some international operations. All major sectors of the software industry were represented in the study: 67 per cent of the companies sold software products, 49 per cent customized their software for each client, and 12 per cent produced software embedded in different devices. Additionally, 43 per cent included training and consulting as part of their offering.

Measures and Descriptive Information

The dependent variables measured the internationalization of the firm from multiple perspectives. First, *the attitude of the entrepreneur towards internationalization* was measured on a summated scale called International Growth Orientation (IGO): its development and validation are reported in

Table 6.1 Descriptives and frequencies of the dimensions of internationalization

Statistics	Time	Intensity	Countries	IGO	Status	N	%
Valid N	54	42	21	95	Valid	92	74.2
Missing N	70	82	103	29	Missing	32	25.8
Mean	3.63	11.52	4.81	3.20	Born global	18	19.6
Median	1.50	.00	2.00	3.33	Other international	36	39.1
Std deviation	5.79	29.87	5.88	1.20	Domestic	38	41.3
Minimum	.00	.00	1.00	1.00			
Maximum	30.00	100.00	20.00	5.00			

Nummela et al. (2005). Secondly, the *speed of internationalization* was measured according to the number of years from the establishment of the company until the first international operations. Thirdly, the international share of the total revenue captured the *intensity of internationalization* and, fourthly, the number of countries measured the extent of market diversification, that is, the *scope of internationalization*. The speed and intensity aspects were further examined by classifying the early phases of internationalization in three status categories. Born-globals are defined here as companies established less than 25 years previously, having started international operations within three years of establishment and generating at least 25 per cent of their revenue from international markets (cf. Knight and Cavusgil 1996). Firms that were international but did not qualify as born-globals were categorized as other internationals, and the third category comprised companies that only operated on the domestic market. The distribution of the respondents according to these dimensions is given in Table 6.1.

The independent variables were dichotomously coded; the value 1 being given if someone in the entrepreneurial team had some prior experience of being an entrepreneur, working abroad, or studying abroad, respectively. As Table 6.2 shows, 56 per cent of the companies could be considered habitual entrepreneurs, 70 per cent had team members with international work experience and 46 per cent had an international education.

FINDINGS

First, we analysed the internationalization of the respondents in relation to the experience- and knowledge-related variables. A logistic regression

Table 6.2 Cross-tabulated frequencies of the independent variables

International education			Entrepreneurship experience		
			No	Yes	Total
No	International work experience	No	17	14	31
		Yes	14	19	33
	Total no int. education		31	33	64
Yes	International work experience	No	3	1	4
		Yes	18	32	50
	Total yes int. education		21	33	54
Total	No work experience		20	15	35
	Yes work experience		32	51	83
	Total		52	66	118

Table 6.3 Logistic regression analysis of the internationalization of respondents

	P(international)			P(not BG|international)		
	B	S.E.	Exp(B)	B	S.E.	Exp(B)
Novice entrepreneurs	1.300	.820	3.670	.470	.781	1.600
No int. work exp.	−3.784***	1.228	.023	19.593	28420.721	3.2E08
No int. education	.875	.771	2.400	1.743*	.932	5.714
Novice entr. & no int. work exp.	1.231	1.544	3.424	−39.410	33627.851	.000
Novice entr. & no int. educ.	−.932	1.223	.394	19.123	17974.842	2.0E08
Constant	.511	.422	1.667	−.134	.518	.875
Model fit	Chi square 29.0 (df = 5), p.00			Chi square 10.6 (df = 5), p.06		
Correct classification rate	Nagelkerke R Square .378 international 88.2%, domestic 59.5%, overall 76.1%			Nagelkerke R Square .264 BG 50%, other int. 80%, overall 70.6%		

analysis was conducted, with internationalization as a dependent variable. The results of the analysis are shown in Table 6.3.

The left-hand model in Table 6.3 compares the domestic and the internationalized firms. It explains internationalization to a moderate degree, but the effect was significant only for international work experience: when

Table 6.4 Univariate GLM results for IGO and speed of internationalization

Source	Dependent variable: IGO R^2 = .303 (Adj. R^2 = .261)			Dependent variable:TIME R^2 = .179 (Adj. R^2 = .087)		
	Type III SS (df)	F	B	Type III SS (df)	F	B
Corrected model	37.5 (5)	7.2***		311.2(5)	2.0	
Intercept	595.3 (1)	571.6***	3.33***	51.6(1)	1.6	2.20
Novice entr.	6.0 (1)	5.8**	.64*	2.7 (1)	.1	1.72
No int. work exp.	26.7 (1)	25.7***	−1.65***	100.9 (1)	3.2*	−2.83
No int. education	.0 (1)	.0	.30	161.8 (1)	5.1**	1.63
Novice entr. & no int. work exp.	.9 (1)	.9	.51	29.1 (1)	.9	−6.57
Novice entr. & no int. educ.	1.5 (1)	1.4	−.61	59.6 (1)	1.9	5.04
Error	86.4 (83)			1431.0 (45)		
Total	1027.7 (89)			2450.0 (51)		
Corrected total	124.0 (88)			1742.2 (50)		

the management had this experience there were over 40 times higher odds that the firm also had international operations compared with firms with no such management experience.

The right-hand model compares the born-globals and other internationalized firms. The explanatory power is weaker than in the preceding model (significant only at the 0.1 level), and only education seemed to divide the groups somewhat significantly. Firms with internationally educated members in the management team were more likely to adopt a born-global strategy in their internationalization.

Next we studied the knowledge- and experience-related variables in relation to the attitudinal measure (international growth orientation – IGO) as well as to the speed of internationalization. The results of this analysis are given in Table 6.4.

As Table 6.4 indicates, the international growth orientation of the companies was influenced significantly by both prior entrepreneurial and

Table 6.5 Univariate GLM results for market diversity and internationalization intensity

Source	Dependent Variable: COUNTRIES R^2 = .570 (Adj. R^2 = .426)			Dependent Variable: INTENSITY R^2 = .047 (Adj. R^2 = −.089)		
	Type III SS (df)	F	B	Type III SS (df)	F	B
Corrected Model	393.7(5)	4.0**		1707.5(5)	.3	
Intercept	72.6 (1)	3.7*	4.83**	1788.9 (1)	1.8	11.67
Novice entr.	.3 (1)	.0	−2.17	221.8 (1)	.2	5.00
No int. work exp.	84.5 (1)	4.3*	−.50	224.8 (1)	.2	−1.00
No int. education	60.7 (1)	3.1	−3.33	13.9 (1)	.0	−9.67
Novice entr. & no int. work exp.	72.0 (1)	3.6*	−12.00*	167.3 (1)	.2	−12.56
Novice entr. & no int. educ.	184.1 (1)	9.3***	15.67***	413.9 (1)	.4	16.33
Error	297.5 (15)			34736.9 (35)		
Total	1177.0 (21)			42158.0 (41)		
Corrected total	691.2 (20)			36444.4 (40)		

international work experience. This finding is in line with those of earlier studies on international growth orientation (see, for example, Heinonen et al. 2004; Jantunen et al. 2008; Nummela et al. 2005): novice entrepreneurs and firms with more international work experience are more inclined towards international growth. None of the three determinants of experience associated significantly with the rapidity of internationalization. However, it seems that a lack of international education somewhat delays the start of the process.

A similar analysis was conducted with regard to the relationship between the knowledge- and experience-related variables and the scope and intensity of internationalization. These findings are summarized in Table 6.5.

As Table 6.5 shows, the model explained international market concentration/diversification, that is, the scope of internationalization, reasonably well. Although there was no main effect for entrepreneurial experience,

it did have significant interactions with other variables. Figures 6.2 and 6.3 illustrate these interactions.

First, if management possesses prior entrepreneurial experience it does not matter in terms of the scope of internationalization (market diversification) whether or not there is prior international work experience. However, in the absence of prior entrepreneurial experience, the firm with international work experience operates in many more target countries than the others. In entrepreneurially experienced firms education has a significantly positive effect on the number of target countries, whereas this effect is negative among novice entrepreneurs. The determinants in our model could not explain the ratio of foreign sales to total sales, that is, internationalization intensity.

CONCLUSIONS

Our aim in this study was to contribute to the understanding of international entrepreneurship by scrutinizing the effects of previous entrepreneurial experience on the firms' internationalization trajectories. There is a stream of research confirming differences in economic performance between habitual and novice entrepreneurs (for example, Alsos and Kolvereid 1998; Westhead and Wright 1998; Westhead et al. 2003), for example, but there remains a need for research on the role that prior entrepreneurial experience plays in the internationalization process (Presutti et al. 2008 and McGaughey 2007a, 2007b, being exceptions). Studies focusing on previous experience would be particularly useful given the double liabilities of 'newness' and 'foreignness' that international entrepreneurs typically face.

Our findings confirm the fact that there are notable differences in orientation towards international growth between habitual and novice entrepreneurial firms. For example, it seems that firms with prior entrepreneurial experience have a weaker international growth orientation than novice entrepreneurs. This is an interesting result, and one reason for it could be that second-time entrepreneurs are also more alert than 'novices' to the potential problems and challenges related to international growth.

With regard to the speed and intensity of internationalization, it seems that prior experience does not have much explanatory power on either dimension examined separately. However, international work experience and education did have some role in explaining the internationalization trajectory of the firm, that is, whether it chose to follow a born-global or other internationalization strategy, or to stay in the home market. Evidently the managers were able to acquire knowledge about foreign markets during their periods of work and education abroad. Further, this

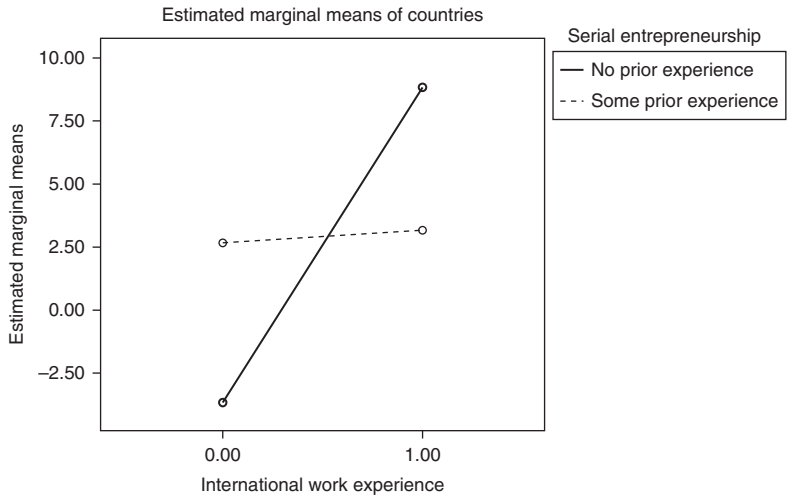

Figure 6.2 The interaction effects of habitual (serial) entrepreneurship and international work experience on the number of target countries

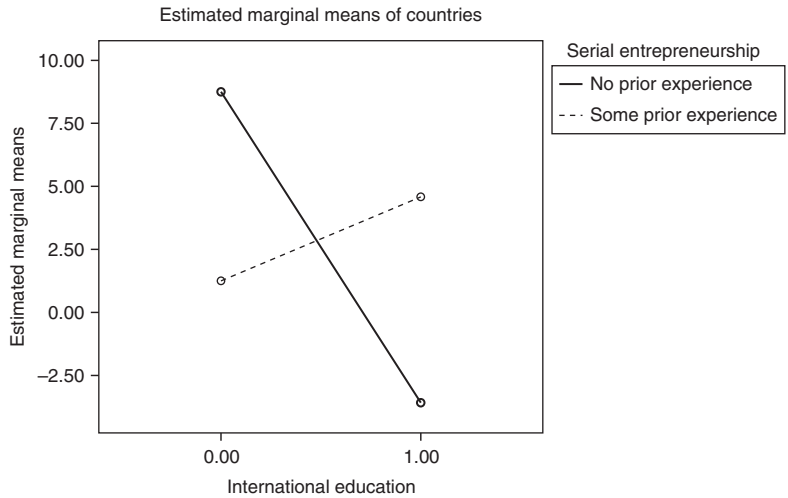

Figure 6.3 The interaction effects of habitual (serial) entrepreneurship and international education on the number of target countries

enabled them to venture into international markets more rapidly and to cope better with the 'liabilities of foreignness' than managers who did not have such experience. Thus, in this respect the findings are in line with earlier literature on born-globals and international new ventures.

In terms of the scope of internationalization – that is, market diversification – we found an interesting significant interaction between habitual entrepreneurship and prior international experience (cf. Figures 6.2 and 6.3). The most diversified companies were those with some international work experience but no international education or entrepreneurial experience. Among the habitual entrepreneurs an international education encouraged market diversification, whereas among the novices it seemed to discourage it. In our view these findings clearly highlight the importance of considering prior entrepreneurial start-up experience not in isolation but in the context of other experience determinants, such as international work experience and education. McGaughey (2007a) also noted the linkage between prior entrepreneurial experience and the geographic reach of new ventures.

The reader should keep in mind a couple of limitations in interpreting our findings. First, the empirical results of our study represent only a snapshot of company activities, and the use of cross-sectional data does not allow strong conclusions to be made about causal relationships. As such, it suffers from a problem that is common in entrepreneurship studies on habitual entrepreneurs: they are studied from a cross-sectional rather than a longitudinal perspective (Rosa 1998). Although a process approach would be preferable, so far it has rarely been adopted (McGaughey 2007a, 2007b). It thus seems that there is a need for qualitative, in-depth longitudinal studies focusing upon different types of international entrepreneurs. Another limitation of this study is that the sample covered companies in a single country, Finland. Thus, the generalizability of the findings should be further tested.

Finally, our findings confirm the argument put forward by Rosa (1998) that habitual entrepreneurs create businesses in different ways and in different circumstances than novice entrepreneurs. Consequently, it is very probable that they also differ from other firms in terms of their internationalization. This aspect deserves much more research attention in the future – both from researchers and policy makers.

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7. The nature of international relationships and performance: policy implications from the case of globally integrated small firms

Christos Kalantaridis and Ivaylo Vassilev

INTRODUCTION

Changes in the scope for small firm engagement with world markets led to the growth in the number of studies exploring the internationalization of the small firm (Wright et al. 2007). This body of knowledge is underpinned by the conceptual premise that 'size matters'. The impact of smallness is invariably conceptualized in terms of resource-related constraints (OECD 2002), as well as the overarching influence of the entrepreneurial personality (McDougal and Oviatt 2000). The argument goes that, as a result of size, the processes recorded in small businesses are significantly different from those concerning large – often multinational – enterprises (Dimitratos and Jones 2005).

As a consequence of this, and supported by the assumption that internationalization influences positively performance, a host of policy initiatives to support the engagement of small firms with the world markets emerged. Within this context, a key policy challenge is to overcome the reluctance (behavioural) or inability (resource based) of small firms to internationalize. Thus, policy initiatives focus heavily on encouraging new small firms to trade internationally from inception, support established 'export capable' but inexperienced small firms to export, and promote additional exporting by those already involved in such activity (Wright et al. 2007).

This chapter sets out to explore the nature of forward (with buyers) and backward (with suppliers/subcontractors) international relationships established by globally integrated small firms, and explore implications for performance and policy. In doing so, the chapter compares the experience of globally integrated small firms with their medium and large-scale counterparts. The paper uses insights provided by transaction cost economics

and the global commodity chain approach in order to decipher the results of a survey of 755 firms located across five European Union (EU) countries and four sectors.

Globally integrated firms are defined here by their involvement in geographically dispersed activities (Dicken et al. 1998) that require a considerable degree of connectivity and integrated management decision-making across national borders. Partly as a result of their functional integration in global networks of production and distribution, firms of this type demonstrate extensive involvement and commitment to international activities that include a combination of exporting, importing, international subcontracting-in and out, affiliation to other foreign companies, or foreign investment.

This chapter is organized as follows. The following section undertakes a focused review of the literature. Then the chapter examines, in some detail, the methods used in the fieldwork investigation, as well as the main variables used in the analysis. The findings of the enterprise survey are presented in the fourth section: distinguishing between forward and backward international relationships. Finally, the chapter offers some conclusions.

THE LITERATURE

Internationalization of the Small Firm

The internationalization of the small firm literature focuses heavily on a handful of key research questions: which national markets shall a small firm enter, how (mode of entry) and when (in relation to the stage in the development of the firm), as well as the impact of internationalization on business performance (for two recent comprehensive reviews of the literature see Ruzzier et al. 2006, and Wright et al. 2007). Rather unexpectedly, to date there have been no studies exploring the impact of firm size on the nature of the relationships created by small firms (a gap also identified by Wright et al. 2007).

This is despite the fact that the importance of relationships is readily acknowledged in the existing literature, because existing relationships may assist internationalization either through a process of gradual learning through interaction (Johanson and Mattson 1993) or through a symbiosis with large firms (Dana and Wright 2004). As far as the former is concerned, relationships were examined in the context of breaking out of the confines of the national market. Thus, researchers examined how existing networks (within the country of origin) may be used in the process of moving beyond the national boundaries (Johanson and Mattson 1993). One of the key considerations within this context is how small

firms may exploit their position in domestic networks in internationalization (Ruzzier et al. 2006). This is not very dissimilar to one of the lines of (conflicting) arguments developed in relation to small and large-firm symbiosis. This perceives relationships between small and large firms as a means to overcome size-related barriers to internationalization (Acs et al. 1997; Le Gales et al. 2004; Phelps et al. 2001). On the other hand, there are others who adopt a more sceptical view. They argue that small firms may become dependent on resources controlled by large firms (O'Farrell et al. 1998; Pfeffer and Salancik 1978).

A similar argument is developed by Morrisey and Pittaway (2006) in their study of buyer–supplier relationships (generic rather than internationally focused). Their argument goes that small firms are more or less inherently in a weak position within relationships governed by asymmetry of power. In contrast, they argue that, in the absence of power, trust offers small firms a viable alternative for managing relationships. This leads them to conclude that small firms use different methods (more informal and trust based) when engaging in purchasing relationships and, thus, should be viewed differently from their large-scale counterparts (Morrissey and Pittaway 2006). However, this thesis cannot be readily transferred to the case of international relationships on account of the impact of diverse institutional and cultural factors on relationships.

Transaction Cost Economics and Global Commodity Chains

Conceptually this chapter aspires to enrich current work on the internationalization of the small firm, through critical engagement with literature emanating from transaction cost economics (Williamson 1975) and the global commodity (and more recently value) chain (hereafter GCC) approach (Gereffi, 1994; Gereffi et al. 2005). Research in this context is driven by the question: 'if production is increasingly fragmented across space and between firms, then how are these fragmented activities coordinated?' (Gereffi et al. 2005, p. 80).

Transaction cost economics focuses squarely on relationships of exchange between organizations (transactions), and sets out to explain the choice of emerging governance structures. Williamson (2005) defines governance using Commons's triple of conflict, mutuality and order. Thus, governance is the 'means by which to infuse order, thereby mitigate conflict and realize mutual gains' (Williamson 2005, p. 3). Within this context, the concept of mutuality is central in deciphering spot markets, hybrids (a variety of long-term contracts) and hierarchies. However, transaction cost economics attaches relatively less importance to power, both on account of the fact that it is diffused and ill-defined, but also because

power asymmetries can be foreseen and only entered into voluntarily when the benefits accrued by those involved in the transaction (and especially the less powerful agent) exceed the costs (Williamson 1996). The choice of governance structure is influenced by asset specificity (which takes a variety of forms, including physical, human, site, dedicated and brand name), the characteristics of the institutional setting (and the ensuing disturbances to which transactions are subject) and the frequency of transactions (Williamson 2002). In the case of transactions that cut across national borders, with differing institutional settings and increased costs of transacting, hierarchical and quasi-hierarchical governance structures may be the preferred choice. This in turn suggests that large firms may be better equipped to manage (or emerge as a result of) internationalization.

The GCC approach also provides useful insights into the reconfiguration of industrial dynamics in increasingly integrated networks of production and distribution. Drawing upon the world systems theory, advocates of this approach set out to investigate the emergence of a new global manufacturing system, in which integration extends beyond international trade, to include centrally coordinated but territorially dispersed production of activities along the chains of individual commodities (Raikes et al. 2000). A commodity chain therefore, traces the entire trajectory of a product from its conception and design, through to retail and consumption – linking households, enterprises, regions and states to one another (Gereffi 1994). Initially, two types of GCC governance were identified: producer driven (where multinational companies and other invariably large industrial concerns control the production system) and buyer driven. Both of these types of governance afford leading roles to large ventures (either in manufacturing or in retail). A more recent variant of this approach distinguishes between markets, modular value chains, relational value chains, captive values chains and hierarchies (Gereffi et al. 2005). Central to the function of these governance structures is the concept of power, and how power can be used. In captive value chains, like hierarchies, there is a high degree of explicit coordination and asymmetrical power between the parties involved in the relationship, while in relational value chains coordination is achieved through close dialogue between more or less equal parties (Gereffi et al. 2005). Lastly, in modular chains, as in markets, the level of coordination is modest and switching partners is easy.

The analytical unit for the purposes of this study is the relationship, an entity that is similar to the transaction in terms of its micro-level nature. However, the relationship is viewed here from the point of view of the firm and contextualized, in contrast to the abstract manner adopted by transaction cost economics, and examined in geographical (national) and industrial settings, in a manner comparable to the GCC approach. Key types

of relationships are sought, that reflect existing governance structures and types of chains. The concepts of mutuality and asymmetric power are used in this study to decipher the nature of relationships. These concepts are not mutually exclusive: mutuality can exist alongside asymmetry of power. Indeed, being in a more powerful position may also prompt trustworthy behaviour. By exploring both forward and backward international relationships this chapter aims to acquire a broader – though admittedly restricted in comparison to the GCC – view of the chain.

Policy

As discussed previously in this section, one of the key drivers for small firm internationalization is the liberalization of the structures governing world trade. The ensuing decline in barriers to the flow of trade, capital and to some degree people is instrumental in enhancing the ability of small firms to engage internationally. The adoption of a liberal approach globally, exists alongside interventionist measures at the national level. These are manifested in the creation of a host of new initiatives aimed at supporting small firms to engage in world markets (OECD 1997; Wright et al. 2007).

These initiatives are underpinned by the view that the internationalization of small firms augers well for their ability to compete successfully in domestic markets, especially as in some regional settings (such as the EU) the distinction between domestic and international becomes increasingly blurred. More importantly however, small firm internationalization is viewed by policy-makers as a means of conferring economic benefit. Small firms seeking and exploiting opportunities elsewhere in the world are able to create new jobs and wealth. A recent EU (2007) study suggests that small firm internationalization policy is justified on account of: (1) the enhancement of competitiveness; (2) the attainment of a level playing field between small firms and multinationals, (3) the achievement of price competitive effects resulting from internationalization, and (4) additionality, that is, that many small firms would not consider internationalization without government support.

However, research into the relationship between internationalization and business performance does not provide conclusive evidence supporting this thesis. Some studies identify a positive link between exports and performance in SMEs (Beamish and Lu 2001; Grant et al. 1988; Kogut 1985) while others do not (Majocchi and Zucchella 2003). Moreover, empirical research also points to the adverse effects of the 'liability of foreignness' in instances where foreign direct investment (FDI) is the preferred means of internationalization (Beamish and Lu 2001; Majocchi and Zucchella 2003).

The positive (perceived or actual) effects of increased internationalization

of small firms are questioned in the case of globally integrated ventures. This is because of the difficulty in containing any job and wealth creation benefits within the national boundaries (OECD 1997). Globally integrated small firms are engaged in forward and backward international relationships providing and acquiring services and products from elsewhere in the world. Thus, some of the jobs and wealth they create may occur elsewhere. Moreover, global integration may encourage (even) small firms to move a significant part or the entirety of their operations to another country (for an example see Labrianidis and Kalantaridis 2004).

In instances like these, effects of policy initiatives aimed at enhancing global integration may be equivocal. This depends on the rationale behind the policy initiative, which in this case is linked with its origin. In most instances, regional and national policies supporting the internationalization of the small firm aspire to confine wealth creation within a specific geographical setting. In this context, the emergence of footloose globally integrated small firms is undoubtedly viewed as negative. However, at the supranational level, in the case of this study the European Union, delocalization may be viewed positively. This is because one of the key objectives of policy actions at the EU level is the enhancement of convergence between nations and regions.

The threat of creating a myriad of footloose globally integrated small firms is somewhat moderated by the embeddedness of the entrepreneurs themselves in the contexts within which they operate. Moreover, the potential adverse effects of action supporting the global integration of small firms may be set against the opportunities lost by inaction (as shown by a 2007 OECD study). Small firms integrated in global supply chains, may benefit significantly in terms of expansion in international markets, efficiency (through forward and backward relationships), and access to new and innovative technologies (OECD 2007). Challenges are invariably linked with relational matters; that is, awareness of their position as well as new trends, compliance with standards and upgrading. Interestingly, enterprises of this kind indicated that 'governments at the local or national level have provided them with little or no support for facilitating their participation in global supply chains' (OECD 2007, p 6).

METHODOLOGY

Field Research

This chapter draws upon the findings of 775 interviews with senior managers and executives in five countries: namely the UK, Greece and three

Table 7.1 Locational and sector distribution of the enterprises surveyed (absolute numbers)

	Software	Electronics	Clothing	Footwear	Total
Bulgaria	51	44	61	44	200
Estonia	52	77	60	11	200
Poland	50	24	92	34	200
Greece	20	21	31	8	80
UK	18	23	12	22	75
Total	191	189	256	119	775

former socialist economies in Eastern Europe – Poland, Estonia and Bulgaria. Table 7.1 captures the breakdown of responses by country and sector. As can be seen from the table, there was an intentional emphasis placed on new rather than old EU members. The Eastern European countries received greater emphasis in the survey because they were viewed as the main beneficiaries (and potentially future losers) in the process of global integration – a view supported by numerous recent studies (Kalantaridis et al. 2003, 2008; Pickles et al. 2006; Smith 2003). Moreover, the pivotal position of these countries (between the EU core and less developed countries) underpinned an expectation (subsequently borne out by evidence) that enterprise strategies would reflect a multitude of processes of global integration. Nonetheless, the significant diversity in the number of enterprises involved in the survey between Eastern and Western European countries may influence results. As a result, the impact of country – as a variable explaining variation – is reported in all instances where significant disparities exist.

The sectors involved in the study were clothing and footwear (two traditional manufacturing sectors that have been at the forefront of the move of production from advanced industrialized to intermediate, less developed and post-industrial economies), electronics (a technology-intensive manufacturing sector, where the pursuit of low-cost locations is becoming increasingly apparent for assembly type operations) and software (a services industry where knowledge-based competitive advantages remain in advanced industrialized countries and increasingly engage the highly skilled workforce of post-socialist countries). The four sectors examined here capture the two ideal-type chains devised by advocates of the GCC approach (Gereffi 1994). Thus, electronics and software are undoubtedly supplier driven, while clothing and footwear are buyer driven. There were also some disparities regarding the sectoral distribution of the sample – mainly an under-representation of footwear. This was the result of the low

number of enterprises in the sector in smaller countries – such as Greece and Estonia. The sectoral impact is also examined throughout the chapter as an explanatory variable for apparent diversity.

The enterprises surveyed were not randomly selected, given the emphasis placed in the study on the process of global integration. In each country a list of companies was compiled using commercial datasets, and telephone directories. Enterprises were contacted, over the telephone, in order to explore their eligibility (in the sense that they were involved in international operations). Five filter questions were used in order to identify companies that could be included in the survey. Firms that were included in the study met one or more of the following criteria: (1) an affiliate of a foreign firm, or (2) the firm itself having affiliates abroad, (3) received or (4) provided international subcontracting, or (5) were involved in any other international operations. Because of the methods used for the selection of the enterprises surveyed, the findings do not capture representativeness, but instead aspire to provide insights into the process at work in global networks of production and distribution.

For the purposes of the survey standard EU definitions are used. Therefore, small enterprises are those employing up to 49 persons and invariably independent. There are a handful of instances where small firms are owned by another organization, but in this case the combined size of parent and subsidiary does not exceed 49 employees. Medium-sized firms are those employing between 50 and 249 persons, and are either independent or belong to another organization (with a combined employment total of up to 249). Large firms employ more than 249 people and/or are part of entities with more than 249 employees. Some 38 per cent of the enterprises in our sample are small, 39 per cent are medium-sized with the balance (23 per cent) being large companies.

It is worth pointing out from the outset that there are some differences in terms of location, and sectors falling in different sizebands. In line with the wider industrial structures in the countries involved in this study, there is a greater incidence of large firms in the UK, and small businesses in Greece (differences significant at $p < .001$). Sectoral differences are also rather predictable. The greatest incidence of large firms is reported in electronics (32 per cent), while software recorded the highest incidence of small businesses (57 per cent). Medium-sized firms account for half of the total in footwear (difference significant a $p < .001$).

For the purposes of the survey a semi-structured questionnaire was deployed. The questionnaire focused squarely on the firm – even in instances where multi-establishment entities were surveyed. Approximately three-quarters of the questions were closed and coded, while the remaining were open-ended. Closed questions provided us with a total of 271

variables (entered and processed with SPSS) covering themes such as the characteristics of the firm, exports, in-sourcing, outsourcing, firm subsidiaries and delocalization effects.

Key Variables

In exploring the nature of the relationships between firms of different size we undertook a hierarchical cluster analysis of two groups of indicators. The first grouping was viewed as a measure of asymmetry of power between the parties to the relationship (a concept commonly used in both transaction cost economics and economic geography). This involved three variables: the number of foreign companies serviced, the percentage of sales directed to the main buyer and a Likert-type variable capturing the balance of power (with 1 indicating power resting with the firm interviewed, and 5 indicating power resting with the other part of the transaction). The second grouping of variables was viewed as measure of mutuality in the relationship (a concept viewed here broadly along the lines used by Commons and Williamson). This comprised of three variables: a Likert-type scale capturing mutual confidence (with 1 being low and 5 being very high), the number of years of continuous relationships with main buyers/suppliers, and the incidence of discontinued relationships during the three years prior to the contact of the survey.

The hierarchical cluster analysis used the Ward method, a common clustering algorithm, which had also been used effectively in previous studies. This method was selected due to its ability to create compact clusters, which is one of its main advantages (Hair et al. 1995). Indeed, the Ward method merges two clusters, which results in the smallest increase in the overall sum of squared within cluster distances. The sum comprises all distances from each case in the cluster to the centroid of the cluster. The implied distance measure employed by this method is the squared Euclidean distance. The determination of the appropriate number of groups or types is a key but arbitrary decision in hierarchical cluster analysis. In this case, guidance was provided by the increase in within-cluster distances as groups were merged. Relatively large increases, that signify the merging of less similar cases (Carlyle 2001; Harrigan 1985), were apparent from the four- to three-cluster solution.

The analysis was undertaken separately regarding forward and backward international relationships. In both instances the four-cluster solution was adopted. Interestingly, the four clusters identified fall within the confines of a two by two matrix logical framework demonstrated in Table 7.2. The two parameters of the framework are dependence upon a small number of buyers (high/low) and length of relationships (long/short).

Table 7.2 Overview of the clusters emerging regarding forward relationships

		Length of relationships	
		Long	Short
Dependence on main buyers	High	Quasi-hierarchy	Volatile lock-in
	Low	Controlled break-out	'Market exchange'

Those falling in the top-left box manage quasi-hierarchical relationships, defined by power asymmetry – therefore the cost of relationship breakdown may be considerable but not equally so to both parties. This type of relationship bears considerable similarity with captive value chains and hierarchies. Those in the bottom-right box resemble more closely spontaneous 'market exchange', where power asymmetry and mutuality are low and so is the cost of relationship breakdown. This type of relationship is virtually identical with spot markets and modular chains. Interestingly, this cluster emerges as the largest – by far – among the four examined here, while quasi-hierarchical relationships are the smallest. The two other clusters are volatile lock-in (in cases where there is considerable asymmetry of power – in favour of the main buyers – and only limited degree of mutuality) and controlled break-out (when there is precious little asymmetry of power and significant mutuality). Transaction cost economists would classify both of these as hybrids and advocates of the GCC approach as relational value chains.

In order to explore the degree of success (or not) of enterprises, the study focused upon change between two stages in the development of the company, just before integration occurred and the time of the survey (post-integration). This method has one significant disadvantage, in that it compares the success (or otherwise) of adjustment but over a chronological period that may vary from case to case. For the purposes of this inquiry four measures of performance were used: employment, turnover, profits and exports. Given the importance of informality in the clothing industry – especially in Eastern Europe and Greece – it was decided not to pursue change in absolute numbers. Therefore, entrepreneurs were asked to evaluate performance on a five point, Lickert-type scale, whereby 1 indicates considerable decline and 5 indicates considerable growth. Data from these variables were combined into one new three-category variable. The first category comprises enterprises which report decline on all three measures, or record employment growth alongside declining sales and losses (profitless expansion). The second grouping involves enterprises that report no or marginal (within 5 per cent) change in performance. The third grouping

is made up of businesses, which report growth in sales and robust profitability returns combined with declining employment or growth on all three measures. All three categories are value laden: the former providing evidence of negative performance, while the latter suggesting positive performance. The 'no change' grouping is viewed here as neutral.

SURVEY FINDINGS

Globally Integrated Firms

The internationalization characteristics of the firms surveyed demonstrate a degree of commitment and involvement in international markets that goes beyond exporting and importing, and includes international subcontracting arrangements, inward and outward investment (through subsidiaries and joint ventures). Thus, exports are reported by more than 90 per cent of the firms surveyed (one in five businesses export 100 per cent of sales). Moreover, around three-quarters of respondents are involved in international subcontracting-in. International in-sourcing is reported by around a third of respondents, often in the form of international subcontracting-out. Interestingly, however, only around 16 per cent engage in both forward and backward international relationships. Lastly, a quarter of the firms are affiliates of international companies, while 13 per cent engage themselves in direct investment overseas.

Disparities between small, medium and large enterprises exist regarding some of the internationalization dimensions. Indeed, there is only modest diversity in the incidence of exporting: some 82 per cent of small firms maintained forward international relationships in comparison to 94 per cent for medium-sized businesses, with large firms somewhere in between (90 per cent). However, there is significant difference in percentage of firms that direct 100 per cent of their sales turnover to international markets. Just 9 per cent of small firms do so, in comparison to 28 per cent of large ones. This cannot be explained on account of disparities in international subcontracting-in as these are virtually non-existent. There are also precious few disparities in the incidence of backward relationships between enterprises of different size – ranging from 27 per cent among small and medium-sized firms to 30 per cent among large ones. This is also the case regarding their importance as well as international subcontracting-out. There are though some differences in the ability of firms of different size to manage both forward and backward international relationships: this stood at just 8 per cent among small firms, in comparison to around 30 per cent among large ones. There are also profound differences in foreign

ownership among the surveyed enterprises: ranging from some 62.6 per cent among large firms to less than a 10 per cent in the case of their small-scale counterparts. Less acute disparities exist regarding the firms' foreign ownership overseas: 18 per cent and 9 per cent respectively.

These findings support the thesis that the enterprises surveyed are far from representative. Small globally integrated firms also differ from the typical small business. Through their commitment to international markets they have been successful in developing the competences needed. However, small firms demonstrate a difficulty in managing effectively complex relationships. This is supported by the fact that only a fraction of enterprises of this type maintain both forward and backward international relationships.

Forward Relationships

There is only modest, and statistically not significant, difference in the incidence of different types of relationship by size of firm (Table 7.3). Types of relationship that involve considerable power asymmetry (namely quasi-hierarchical and volatile lock-in) are reported by some 32 per cent of small firms, a figure below that for large firms (43.4 per cent). Even though the disparity is modest, it appears to be contrary to the view that small ventures often become attached to a small number of buyers. However, this disparity can be explained on account of the strong ties generated by the higher incidence of FDI and joint ventures among large ventures. In fact, relationships coordinated through power asymmetry are reported by 29 per cent of domestically owned firms, in comparison to nearly 62 per cent among those with some foreign ownership. Controlled break-out – the type of relationship coordinated by mutuality – is reported by 21 per cent of small firms, a figure marginally above that for large ones (18.4 per cent).

Table 7.3 Clusters of forward relationships by size of firm

	Quasi-hierarchy	Controlled break-out	Volatile lock-in	Market exchange
Small	15.0	21.4	18.6	45.0
Medium	17.0	18.7	28.7	35.7
Large	18.4	18.4	25.0	38.2
Total	16.5	19.6	24.3	39.5

Note: Sig. .455.

Source: Survey data.

Table 7.4 Clusters of forward relationships by size of firm and country

Country	Size	Quasi-hierarchy	Controlled break-out	Volatile lock-in	Market exchange
Bulgaria	Small	17	17	26	39
	Large	15	28	18	39
Estonia	Small	13	20	13	53
	Large	40	13	26	20
Poland	Small	8	22	13	57
	Large	10	29	14	48
Greece	Small	26	15	33	26
	Large	14	14	0	72

Source: Survey data.

At the other extreme, some 45 per cent of small firms maintain 'market exchange' relationships, in comparison to 38 per cent for large firms. This may be linked with a more 'opportunistic' approach to international markets, adopted by small firms.

The findings presented in Table 7.3 may be explained by the unequal locational and sectoral distribution of the firms surveyed. Tables 7.4 and 7.5 show that both location and sector impact upon the nature of forward international relationships reported by firms of different size. As far as small firms are concerned, there is a clear divide between Estonia and Poland (on the one side) and Greece (on the other). In the former two countries relationships that require little coordination (market exchange) are reported by more than half of all firms of this size, probably a reflection of their ability to establish effective and efficient market institutions. As far as large firms are concerned, two-thirds of those located in Estonia maintain relationships coordinated by power asymmetry. This is linked to the fact that a very high percentage of large firms in this country (86 per cent) are FDIs or joint ventures with international partners (primarily from Finland – across the Baltic – in the electronics industry). In contrast, in Greece, nearly 60 per cent of small firms report forward international relationships coordinated by power, in response to the difficulty of enforcing contracts (also evinced by the size of informal economic activities among enterprises of this size). Large firms in this country engage in 'market exchange'. In Bulgaria there are no significant disparities in the incidence of clusters of forward relationships between small and large firms, while in the case of the UK the number of companies engaging in forward international relationships was too small to allow analysis of the data.

A similarly complex picture emerges regarding sectoral diversity.

Table 7.5 Clusters of forward relationships by size of firm and sector

Country	Size	Quasi-hierarchy	Controlled break-out	Volatile lock-in	Market exchange
Software	Small	15	13	28	44
	Large	0	40	20	40
Electronics	Small	19	7	44	30
	Large	13	20	47	20
Clothing	Small	15	26	4	53
	Large	22	24	7	46
Footwear	Small	10	29	14	48
	Large	20	27	20	33

Source: Survey data.

Significant disparities exist in the case of software and footwear. As far as the former (supplier-driven) sector is concerned, 'market exchange' is the most commonly reported by firms of all sizes. Small firms though report a greater involvement in quasi-hierarchical relationships and volatile lock-in (coordination through power asymmetry), as they invariably supply sector-specific software solutions to wholesalers and retailers. Large firms however, record a considerable incidence of controlled break-out (mutuality), despite (or probably because of) the fact that two-thirds of large firms in the sector are FDIs and joint ventures invariably seeking relationships with corporate clients in large domestic markets. Indeed, more than three-quarters of large firms in this sector are located in the UK and Poland. In contrast, in the footwear sector (a buyer-driven chain) 'market exchange' is prevalent among small firms, which invariably engage in sales to wholesalers and retailers. Relationships coordinated by power asymmetry (quasi-hierarchical and volatile lock-in) however, are more common in their large-scale counterparts, which are in 40 per cent of cases FDIs and joint ventures seeking production cost advantages (and thus often located in Bulgaria and Estonia). Their output is destined primarily for the parent enterprise. Disparities in the impact of size upon clusters of forward relationship are very small in clothing and electronics.

The evidence regarding forward international relationships depicts a picture of considerable diversity. Enterprises of all sizes are able to develop relationships of all types: from quasi-hierarchical to those resembling spontaneous 'market exchange'. Overall, therefore, the impact of the size of the firm upon the nature of forward international relationships appears to be limited. Moreover, the relative incidence of types of forward international relationships does not vary greatly by firm size. Location

and sector constitute two important factors in determining the nature of the emerging relationships. In some contexts, for example in Bulgaria and in electronics and clothing, their influence eliminates even marginal differences between small and large firms. However, in other settings, such as in Estonia, Poland and Greece, and software and footwear they are the cause of growing disparities.

Comparisons between small and large firms are complicated by the impact of ownership linkages (through FDI and joint ventures) on the forward international relationships created by such firms. More specifically, the influence of ownership linkages differs on account of the reasons behind their establishment, and whether the parent enterprise is also the main buyer. In the case of Estonia (and particularly Estonian electronics) and footwear, ownership linkages aim at reducing production costs and increased flexibility through access to cheap and adaptable sources of labour, and the parent enterprise is the main buyer. This pattern is linked with quasi-hierarchical and controlled break-out relationships. In contrast, in software ownerships linkages are driven by the need to access national markets, and the parent enterprise is not the main buyer. This pattern is linked with market exchange relationships.

Controlled break-out constitutes an interesting type of forward international relationship. This is because it appears to combine the benefits of mutuality without the negative consequences – in terms of asymmetry of power and restricted access to information – involved in quasi-hierarchical relationships. However, small firms appear to be less well equipped to manage a multitude of close relationships involved in this type. This is shown from their performance in relation to large firms that adopt similar forward international relationships. This is also supported by the fact that robust performance in small firms was most commonly reported in instances where forward international relationships were limited to a handful of buyers, even though there was considerable change (volatile lock-in).

Backward Relationships

A similar hierarchical cluster analysis to that undertaken regarding forward international relationships was performed for backward international relationships. However, the coordinating mechanism involved in the four types identified differs between backward and forward international relationships. This is because of difference in perceptions regarding power. Enterprises of all sizes acknowledge power asymmetry in favour of the other party in the transaction in the case of forward relationships. The reverse is the case in backward international relationships (that is, power asymmetry is in favour of the interviewees. As a result, quasi-hierarchical

Table 7.6 Clusters of backward relationships by size of firm

	Quasi-integration	Controlled break-out	Volatile Lock-in	Market exchange
Small	18.8	22.9	22.9	35.4
Medium	15.8	31.6	13.2	39.5
Large	22.6	29.0	3.2	45.2
Total	18.8	27.4	14.5	39.3

Note: Sig. .360.

Source: Survey data.

relationships (that is, the powerful agent – the interviewee – becomes attached to a single or a very small number of suppliers) alongside controlled break-out are linked with mutuality, while volatile lock-in with asymmetry of power.

As shown in Table 7.6, there were only modest, and not statistically significant, differences between size of firm and clusters of backward international relationships. Large firms reported a somewhat greater incidence of relationships coordinated through mutuality (unlike the case of forward relationships). These can be explained in part by the fact that a significant minority (around one in five) of large firms source from their own subsidiaries or joint ventures abroad. In contrast, small firms reported a greater incidence of relationships that involve asymmetry of power (in their favour).

As the number of companies involved in international backward relationships is smaller than those engaged in forward ones, restrictions emerge in exploring the impact of location and sector. As far as the former influence is concerned, there is one interesting disparity that emerged. In Poland and Greece small firms utilize asymmetrical power in coordinating backward relationships, exploiting opportunities to subcontract out further east (in the case of the former) and north (in the case of the latter). In contrast, large firms in both countries use mutuality (itself the result of foreign investment). As far as sectoral disparities are concerned, in software small firms engage predominantly in market exchange, while large ones in relationships coordinate through mutuality. In footwear, however, asymmetry of power constitutes a commonly used coordinating mechanism used by small firms, while large ones in controlled break-out.

Evidence regarding backward international relationships lends support to the arguments developed earlier concerning forward international relationships. Thus, the size of the firm appears to be only of secondary

importance in determining the nature of emerging relationships. However, the effects of size are accentuated in specific locational and sectoral settings.

Nature of Relationships and Performance

The overall data regarding performance indicates the influence of a number of factors that are at work. There is a statistically significant relationship between sector and the nature of backward relationships and performance ($p < .01$ in both instances). As far as sector is concerned, robust performance is apparent in software, while there are precious few differences among the remaining three sectors. In terms of the nature of backward relationships: strong performance is linked with mutuality while weak with power asymmetry. This is somewhat unexpected given the direction of power asymmetry in backward international relationships. There are no statistically significant relationships between performance location, size of firm and the nature of forward international relationships. As far as location is concerned, this finding is contrary to expectation. This is because in the specific sectoral settings (especially in electronics, clothing and footwear) one would expect Eastern European countries to perform better than especially the UK (on account of production cost advantages). In fact, UK firms report a somewhat better performance than all the others surveyed. Interestingly, size also does not appear to influence significantly performance.

Some diversity emerges between the nature of forward international relationships and performance by size of firm. Among large firms controlled break-out is linked with high incidence of positive performance, evidence to the ability of enterprises of this size to manage effectively multiple relationships at the same time (Table 7.7). In contrast, volatile lock-in is linked with low incidence of positive performance among large

Table 7.7 Clusters of forward and backward relationships and mean business performance by size of firm

Relationship	Size	Quasi-hierarchy	Controlled break-out	Volatile lock-in	Market exchange
Forward	Small	2.13	2.33	2.44	2.34
	Large	2.33	2.45	2.15	2.32
Backward	Small	2.33	2.75	1.89	2.23
	Large	3.0	3.0	1.0	2.55

Source: Survey data.

firms. Interestingly, the reverse is the case among small firms, whereby volatile lock-in is linked with high incidence of positive performance. This represents instances where a small firm produces a significant percentage of its sales turnover for a single buyer (or a very small number of them), but does not remain locked in this relationship for a considerable period of time. When this becomes the case (quasi-hierarchical relationships), this results in the lowest incidence of positive performance among small firms.

Interestingly, there are similar patterns regarding the relationship between types of relationships and performance by firms of all sizes between backward and forward international relationships. Thus, small firms are less able to transform relationships coordinated through mutuality into robust performance than their large-scale counterparts. The reverse is the case regarding relationships that involve asymmetry of power.

Evidence regarding performance suggests that globally integrated small firms report (nearly) as robust performance as their large-scale counterparts. This further support the thesis that in the case of globally integrated firms size is only of secondary importance. It is only when small firms opt for relationships that are defined by mutuality that small firm performance is somewhat weaker than that of large firms – evidence to the difficulty of the former type of firms in managing complex relationships.

This brings to the fore the issue of whether global integration affects adversely the commitment of small firms to their country/region of origin. Evidence from this study suggests that this is the case for a minority of such firms – some 15 per cent. This figure is, rather unexpectedly, higher than that reported for large firms (10 per cent). This is despite the greater incidence of foreign ownership (forward and backward) among the latter. Among globally integrated small firms the propensity to relocate is influenced significantly by country and the nature of backward relationships. Indeed, some 47 per cent of small firms in Greece demonstrate a propensity to relocate. This is primarily on account of the combined effect of increased competitive pressures in the domestic market (from low-cost producers elsewhere in the world), and opportunities created by the demise of socialism in the Balkans. As far as the latter is concerned, some 62 per cent of small firms that develop quasi-hierarchical relationships demonstrate a propensity to relocate.

Interpreting this finding is complicated by the fact that the survey did not capture whether relocation was a motive driving the decision to establish quasi-hierarchical relationships among small firms in the first place. Thus, this can be viewed either as a part of a strategic approach to relocate whereby the establishment of quasi-hierarchical relationships constitutes the first step (thus global integration is a means), or as the consequence of these relationships (global integration may be the cause of relocation).

Policy Support

Globally integrated small firms constitute an admittedly small, but undoubtedly interesting segment of the small business sector as a whole. They are able to achieve a degree of integration in the global marketplace that compares favourably with that of their large-scale counterparts. They perform well in relation to large firms, and are able to establish (though not always manage as effectively) all types of international relationships. This is achieved with precious little level of external support. Indeed, only 24 per cent of the small firms surveyed accessed some form of public support during the five years prior to the conduct of the survey. More importantly, this figure is identical to that reported by large firms.

Access to support for small (and large) firms varied predominantly on account of location. Thus, it is enterprises (irrespective of size) located in the UK and Greece that have enjoyed the greater volume of support – some 54 per cent and 58 per cent respectively. In contrast, enterprises in Eastern Europe operate in a less supportive context. This is particularly the case for Bulgarian firms, where support was accessed by less than one in ten of the enterprises surveyed. This result is influenced by the fact that the survey was conducted just after Bulgaria's entry in the EU.

This brings to the fore the issue of business support received and enterprise performance among small firms. The results of the survey show that there is no significant disparity in the performance of globally integrated firms that received support from those that did not: some 24 per cent of firms that performed poorly accessed external support in comparison to 22 per cent among those that reported a robust performance. This is also the case for small firms (21 per cent and 20 per cent respectively). However, external support was accessed disproportionately by small firms that considered relocating outside their current national setting – some 41 per cent did so. This is more than twice than that (18 per cent) reported by small firms that did not consider relocation. No such disparity existed among large firms.

CONCLUSIONS

Before drawing conclusions regarding the findings of this study it is worth pointing out some key limitations. First, the survey instrument provides a snapshot of firms at the time of the fieldwork research, or provided comparisons between fixed points in time, restricting the ability to capture processes that evolved through time. Another problem, generic to all comparisons of enterprise performance, is that they exclude – more or less by

definition – failure, that is, those companies whose existence was discontinued over a period of time. Lastly, the findings are influenced (as shown throughout the chapter) by the selection of country and sector.

This chapter shows that there is a small minority of small firms that are capable of engaging in global networks of production and distribution. They maintain broadly similar types of relationships with medium and large-scale ventures. Thus, the disparities between globally integrated small firms (on the one side), and medium and large firms (on the other) are probably smaller than one would expect on the basis of the premise that size matters (Dimitratos and Jones 2005). Disparities, however, do exist in instances where small firms manage complex relationships (that is, both forward and backward relationships, or relationships which involve mutuality with a number of suppliers).

The chapter also questions widely held views that relationships that are defined by mutuality auger well for small firm internationalization, while those coordinated by power asymmetry do not. First, globally integrated small firms may sometimes occupy positions of power in international relationships – as shown in those involving suppliers. These relationships of power derive from the position of small firms in the supply chain and/or proximity to prosperous markets in advanced industrialized countries (factors not addressed by Morrissey and Pittaway, 2006, who adopt a more generic approach). Secondly, globally integrated small firms appear to benefit (in terms of performance) when managing volatile lock-in relationships, using power asymmetry as a coordinating mechanism. Interestingly this is not only the case regarding backward relationships (where power asymmetry is in favour of the small firms surveyed), but in forward relationships (where power is concentrated at the hands of the other party in the transaction).

This provides some justification to the thesis advanced by Williamson that power asymmetries can be foreseen and are entered into voluntarily as the benefits accrued by those involved in the transaction (even the less powerful agent) exceed the costs. However, this chapter suggests (in contrast to the view adopted by Williamson) that this affords additional importance to the study of power in interorganizational relationships. This offers a useful distinction between power and performance, challenging the sceptical view adopted by Pfeffer and Salancik (1978) and O'Farrel et al. (1998) towards small firm dependence. In turn, this distinction suggests a revision of the desirability (or not) of patterns of small firm development that are often characterized as dependent. Indeed, relationships based on asymmetry of power (even when power rests with the other party) may offer small firms opportunities for global integration. As such, tool kits that enable small firms to manage relationships of this type (as the more

or less powerful party in the transaction) may be useful in enhancing the internationalization of small firms.

So, what are the implications of this study for small firm internationalization policy? To date, these firms have attracted little attention by policymakers, and were able to achieve success with little external support. This fact may provide justification for continuous non-intervention on behalf of national and/or regional government. This approach is consistent with the view (outlined previously in the chapter) that liberalization (that is, non-intervention) is instrumental for the growing involvement of small firms in world markets. Non-interventionist views are underpinned by the fact that there may be a separation between the cost of external support and the benefits derived from it in the case of globally integrated firms. This is because small firms of this type are able (by virtue of their success in international markets) to relocate beyond their country of origin. This chapter lends some support to this thesis, though it cannot distinguish whether global integration is a means for relocation or the cause of it. This finding, however, may also underpin arguments for policy intervention at the supranational level. Indeed, attaining convergence among the nations and regions of the EU could be enhanced through a process of delocalization of globally integrated small firms from advanced to lagging areas. Facilitating the emergence of quasi-hierarchical relationships seems to be a central point in this process.

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8. Exploring entrepreneurial exits: a study of individual exit experiences in Finland and the UK

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INTRODUCTION

Research on entrepreneurship has tended to focus on the creation of new businesses, the characteristics of successful entrepreneurs, as well as the factors behind successful fast-growing new ventures (Politis 2008). In contrast, research on the entrepreneurial exit process and its outcomes is less abundant and often viewed in a negative light (Blackburn and Kovalainen 2009; Mason and Harrison 2006; Politis and Gabrielsson 2009). In this chapter, we argue that it is important to study entrepreneurial exits: both the business entities as well as the people that are central to the exit process. The research findings can help scholars better understand and model entrepreneurial value creation and business life-cycle processes (McGrath 1999). Indeed, our understanding of the entrepreneurial process is incomplete without studying entrepreneurial exits, as this stage of the life cycle has significant effects on entrepreneurs, companies, industries and the economy more broadly (DeTienne 2008).

The literature that exists on entrepreneurial exit tends to associate this process with business failure and often infers that the majority of exits represent unsuccessful businesses (Blackburn and Kovalainen 2009; Stokes and Blackburn 2002). Therefore, entrepreneurial exits are usually considered as a waste of scarce resources, and something to be avoided. More recent thinking argues that exit does not necessarily refer to business failure but the entrepreneurial exit may be a successful outcome (for example, Blackburn and Kovalainen 2009; DeTienne 2009; Headd 2003; Schutjens and Stam 2007; Stokes and Blackburn 2002; Ucbasaran et al. 2009a; Wennberg et al. 2009).

Studying entrepreneurial exits also faces methodological challenges. Previous studies have tended to conflate the closure of the business with

the ex-business owner, which are hard to identify and contact (Blackburn and Kovalainen 2009). Accordingly most studies have taken the firm as a unit of analysis and focused on what happens to the business rather that the owner (DeTienne 2009; Mason and Harrison 2006; Sarasvathy 2004). There is a vast amount of literature on the company-level antecedents or consequences of the business exits (see Decker and Mellewigt 2007). While commendable, many of these studies do not usually apply to a small business context (for example Dixit and Chintagunta 2007). In this chapter, we take a different standpoint and want to focus on individual perspectives of the owner manager who has exited from the businesses, in order to provide new insight into the process of entrepreneurial exit (see DeTienne 2009). We draw on previous literature emphasizing the need to distinguish between different exit situations, reasons and their effects on individual exit experiences (see Wennberg et al. 2009).

The chapter explores entrepreneurial exits by drawing on empirical evidence from Finland and the UK. It focuses on the different exit situations; the reasons for exit; and the effects of the exit experiences of entrepreneurs, particularly in relation to their subsequent intentions toward entrepreneurship. We also explore the kind of 'perceived learning' – that is, the skills and capabilities acquired during the exit process. In addition, any cross-country comparisons between Finland and the UK are exploratory in the sense that based on extant literature we study differences in the exit situations and their impact on experiences in the two countries. Overall, the study contributes to conceptualizing what is meant by entrepreneurial exit, as well as providing new evidence on the experiences and consequences of the exit process on entrepreneurs. As entrepreneurial exits are high in the small and medium-sized enterprise (SME) policy agenda (see for example, European Commission 2008), the significance of this study rests in both its contribution to the theoretical knowledge base and implications for policy development.

ENTREPRENEURIAL EXIT: THEORETICAL DEVELOPMENT

Entrepreneurial Exit

We draw on DeTienne (2009, p. 204) who defines entrepreneurial exit as 'the process by which the founders of privately held firms leave the firm they helped to create; thereby removing themselves, in varying degree, from the primary ownership and decision-making structure of the firm'. Similarly, Stokes and Blackburn (2002, p. 18) refer by exit 'to the end of

an owner's participation in the business, as in the search for "exit routes" by entrepreneurs willing to sell up or exit from a business'. For the purpose of this study entrepreneurial exit is defined as a situation in which a former (or present) business owner has exited from the business which may or may not continue although ownership changes.

Exit Situations and Reasons

The process of entrepreneurial exit may occur at any time during the entrepreneurial process, that is, before the firm is ever founded (conception and gestation), infancy, adolescence, and maturity (DeTienne 2008). Wennberg et al. (2009) suggest four types of entrepreneurial exit situations, differentiating between liquidation and sale on the one hand, and between high and low business performance, on the other hand. The exit situation and reasons vary accordingly, thus affecting the exit decision, entrepreneurs' experiences and subsequent consequences (DeTienne 2008; Stam et al. 2008).

A variety of positive and negative, personal and business related reasons for exit have been cited in the previous studies (for example, Mason and Harrison 2006). Hence, it is important to distinguish between 'non-economic-forced' and 'economic-forced exits' as these different conditions are likely to affect an 'exited' entrepreneur's individual exit experiences and the future aspirations and behaviour of an exited entrepreneur (Harada 2007). It may even be the case, that a business owner has successfully executed a planned exit strategy, closed the company without debt, sold a viable business or retired from the work force (Headd 2003; see Wennberg et al. 2009).

Business related reasons for exit reflect the success and performance of the firm (see Aaltonen and Heinonen 2008; Bates 2005; Gimeno et al. 1997; Harada 2007; Naude 2008; Schutjens and Stam 2007; Watson and Everett 1996). However, an entrepreneur's decision to exit is not solely dependent on the economic performance of the firm. Based on a study by Headd (2003), for example, only one-third of businesses closed under circumstances that entrepreneurs considered unsuccessful. In addition, the entrepreneur's human capital characteristics, demographic traits, labour market situation and costs of switching to other occupations (based on, for example, the entrepreneur's education, skills and experiences) are likely to influence the exit decision (Akola et al. 2007; Bates 2005; Gimeno et al. 1997; Schutjens and Stam 2007).

Person related reasons for exiting the business include, for example, illness, death, family situation, a better employment opportunity, studies and the unwillingness of an entrepreneur to continue the business. Such

reasons are not trivial. Based on a Japanese study, for example, the majority of the exited owner-managers reported non-economic-forced exit reasons (Harada 2007).

Exit Experiences and Entrepreneurial Learning

Research suggests that an entrepreneur's previous experience, investment and routines may constrain their future aspirations and behaviour (Minniti and Bygrave 2001) although there is mixed evidence on the precise links. How an entrepreneur perceives the entrepreneurial exit process, whether the entrepreneurial experience and finally the exit per se is perceived as a 'failure' or a 'success', may affect their future activities (Shepherd 2003). In addition, there is a difference whether entrepreneurs face economic failure, or a failure to meet their own expectations (Ucbasaran et al. 2009a). As with other individuals, entrepreneurs tend to repeat things that they have succeeded in and avoid things that, earlier, have led to uncomfortable situations (McGrath 1999; Minniti and Bygrave 2001; Politis 2005). On the other hand, unpleasant experiences may stimulate learning, which then are reflected in the future aspirations and behaviour of entrepreneurs (McGrath 1999; Rerup 2005; Stam et al. 2008). Hence, it is not only the extent of an entrepreneurial experience that is important, but also the nature of the entrepreneurial experience that reveals how entrepreneurs adjust their subsequent thinking (Ucbasaran et al. 2009b).

A number of empirical studies have acknowledged that entrepreneurial exits may lead to new entrepreneurial activity, as experiences from the preceding endeavours may have developed useful skills and knowledge for the subsequent entrepreneurial undertakings (for example, McGrath 1999; Politis and Gabrielsson 2009; Stam et al. 2008). Politis and Gabrielsson (2009, p. 366) consider entrepreneurial exit (failure) as a 'temporary phase in an ongoing entrepreneurial process which can be used as a valuable source of learning and improved self-awareness'. Through the entrepreneurship process, an entrepreneur may gain useful human capital, develop networks with customers and suppliers and cultivate skills needed in future endeavours (Rerup 2005).

The literature also suggests that entrepreneurs tend to learn most from discontinuous events, and the entrepreneurial exit process may be regarded as one of these (Cope 2003, 2005). It may be argued that critical learning events (see, for example, Cope and Watts 2000; Deakins and Freel 1998; Deakins et al. 2000; Taylor and Thorpe 2004) provide entrepreneurs with more effective learning opportunities than the accumulation of more routinized incremental learning (Cope 2003). In this study, the concept of entrepreneurial learning is used to refer to such learning processes. Based on

Rae (2006) this is regarded as a dynamic process of awareness, reflection, association and application that involves transforming experience and knowledge into functional learning outcomes. It comprises knowledge, behaviour and affective or emotional learning (Cope 2005). Similarly, Politis (2008) argues that exit experiences are crucial for developing the entrepreneur's knowledge base which helps them to deal with uncertainties and expand the search for new opportunities, whether it is in the form of new businesses or other labour market activities. Elsewhere, however, Frankish et al. (forthcoming) found that prior business experience had no significant influence, positive or negative, on survival rates in the two years after start-up and the authors infer from this that there is no support for entrepreneurial learning deriving from prior experience.

The literature on entrepreneurial learning distinguishes the content that is learnt from the process of how learning takes place (Harrison and Leitch 2005; Zang et al. 2006). Cope (2005) has outlined different skills and abilities that are crucial for entrepreneurs: learning about oneself, learning about the business, learning about the environment and entrepreneurial networks, learning about small business management, and learning about the nature and management of relationships. These skill and abilities are something exited entrepreneurs have tackled during their entrepreneurial career. It is argued that entrepreneurial exit as a critical learning event has potential to promote learning outcomes among the exited entrepreneurs. These individual exit experiences are then reflected in ex-owner managers' future choices (see Politis 2005).

Previous research demonstrates mixed findings on the associations between the exit reasons and exit experiences, and therefore they need to be further studied. Based on previous research, a taxonomy conceptualizing the exit reasons and exit experiences can be formed: (1) negative exit reasons and poor exit experience, (2) negative exit reasons and good exit experience, (3) positive exit reasons and poor exit experience and (4) positive exit reasons and good exit experience. This chapter explores these combinations empirically with Finnish and UK data-sets.

DATA AND METHODS

Selected Countries

The study explores entrepreneurial exits in two European countries: Finland and the UK. GEM data shows some differences in the overall entrepreneurial activity for the UK and Finland at 11.7 per cent and 16.0 per cent respectively (Bosma et al. 2009). On the other hand, the business

discontinuance rates of both countries are at around 2 per cent. These aggregate figures tell us little about the impact of the process of discontinuance or entrepreneurs' exit experiences. Given that entrepreneurial exits are embedded in specific economic, cultural and social contexts, it is interesting to explore the situation in two different countries. Previous studies on entrepreneurial exits have suggested that national legal systems, for example, may affect business exits (Wennberg et al. 2009).

Finland is a relatively small, sparsely populated and remote country in a Northern Europe with 'moderate' amount of business dynamics (see Stenholm et al. 2009). In contrast, the UK economy is regarded as much more heterogeneous and dynamic. As in most European countries, owing to a stigmatization of the closure process, little tolerance is given to an entrepreneur to learn from mistakes or business exit in both studied countries (Deakins and Freel 1998; European Commission 2002).

Sample and Design

We acknowledge it is difficult to approach exited entrepreneurs and obtain reliable information on their exit experiences and subsequent actions (Blackburn and Kovalainen 2009; Harada 2007). The British data were collected using a structured questionnaire, employing a combination of postal and telephone methods in 1999/2000 on targeting 2719 former or present business owners. The overall response rate was 14 per cent, with a total of 388 usable responses returned. The British sampling frame was designed to be as representative as possible of the range of business closures and exit types of those who had exited in the previous two years. It was derived from as wide a source as possible to eliminate the bias of any single source and comprised HSBC customers including business account closures, Dun and Bradstreet lists of existing businesses, and closures identified during research on other projects.

The Finnish data were collected using telephone interviews in 2007 which comprised those former and present entrepreneurs who had left their business during the past ten years. A pilot survey was conducted as a part of a national weekly omnibus survey to get information on the frequency of the exits among the Finnish adult population. This information was exploited when designing the sample. Consequently, originally a random sample of 24 500 persons, of whom 11 450 were eventually contacted, was drawn from the Population Register Center. The sample consisted of 25–71-year-old Finns. At first, one screening question was asked from everyone to identify individuals having left their business. Based on that question respondents were divided into three groups: 86 per cent of the households had no members belonging to the target group; 11 per cent

refused to participate, and the rest (3 per cent, 299 persons) were both willing to participate and belonged to the target group. The questionnaire was completed by them.

The survey data in both countries were cross-sectional. Therefore, we acknowledge it may suffer from recall error since it may have been hard for the respondents to look back to the past and retrospectively describe the exit situation. Nor do the survey data allow us to analyse, in depth, the prior career steps of an exited entrepreneur, or their later career episodes. The data were collected in different time periods, although we consider this to be insignificant given the focus of the research. However, the data-set allows us to focus on the entrepreneur's perceptions of the exited business, the exit situation and experiences.

There were some differences in the characteristics of the samples. In the Finnish sample there were more women (31 per cent) than in the UK (14 per cent). Thirty-three per cent of the Finnish respondents and 24 per cent of the UK respondents were over 55 years old. However, the share of respondents under 45 years of age was around 40 per cent in both countries (37 per cent and 41 per cent respectively). As to the educational level, the UK data was more heterogeneous than the Finnish data.

In order to check for non-response bias, the characteristics of the enterprises from the different sources were cross-checked in the UK data and they showed a high degree of conformity. The Finnish data were compared with the longitudinal panel data of Statistics Finland which is composed of a 10 per cent sample of the Finnish adult population. The data provide information about transitions between self-employment and employment. The age distribution and regional distribution of these two data-sets were very similar. However, in the Finnish data women were slightly underrepresented.

Variables and Measures

The survey included a number of questions about the reasons leading to the entrepreneurial exit, the exit situation, the entrepreneur's exit experiences as well as skills and knowledge acquired before exiting. In addition, background information of the respondents was collected.

As to *exit reasons*, following the extant literature, we distinguish between personal and business factors. The Finnish interviewees were asked to select the most important personal exit reason from a list of ten reasons and the most important business-related reason from a list of seven reasons. In the British questionnaire there were seven personal reasons for exiting the business. In addition, the respondents had the possibility to state some other reasons or give a 'don't know' or 'not any such reasons' answer. The

open-ended answers were coded and, finally, exit reasons were categorized into four measures: negative and positive business and personal related reasons. The variables were coded as a dummy variable (0/1). The *business related, negative exit reasons* included: 'insufficient financial rewards', 'business insolvent', 'competition', 'running out of operational funds', 'risk', 'business closed down' and 'taxation and legislation'. The *business related, positive exit reasons* were: 'had an idea for a different business', 'breakdown in relationship with owners', 'preferred being a sole trader' and 'to form a partnership'. Although 'breakdown in relationship with other owners' was not considered a positive reason as such, it was here classified as one, since this business related reason was not caused by insufficient profit of the firm. The *person related, negative reasons* were 'stressfulness of the business ownership', 'health problems' or 'injury of the owner' and 'lack of interest'. On the other hand, *positive, person related reasons* were 'want to retire' and 'received an attractive job offer'.

In this study we seek to link individual *exit experiences* with how they affect their motives to start anew in the future. We acknowledge that it is hard to distinguish between experiences related to the actual exit from any preceding entrepreneurship experiences. Therefore, we use entrepreneurs' encouragement/discouragement to new business start-ups as a proxy of their individual perception on the nature of exit experience. The question was phrased: 'Overall, has your experience of managing that particular business encouraged or discouraged you to have your own business in the future?' The respondents were asked to rate the impact on a five-point Likert scale. Those choosing the ratings 4 and 5 were regarded to be encouraged (coded as 1) and those choosing either 1 or 2, were regarded as discouraged (coded as 0) in the analyses. Respondents choosing rating 3 were excluded from the analysis.

The data set included 15 questions measuring the *knowledge and skills learnt* during running the exited business. Respondents were asked to rate (on a five-point Likert scale) their perception on their skills improvements as an outcome of the exited business. A factor analysis was conducted and the principal component analysis with Varimax rotation method gave a three factor solution (see Appendix Table 8A.1 for the factor solution and the variables). New sum variables were computed on the basis of the analysis. The variables related to skills were named: (1) 'Approaching the markets' (networks, markets and customers), (2) 'Monitoring and management' (accounting, leadership, human resource management) and (3) 'Entrepreneur's self-management' (management of self and change). Respondents were also asked to estimate the *financial state of business* at the time of business exit by rating their perception of it on a five-point Likert scale (1 = ailing and 5 = thriving).

RESULTS: ENTREPRENEURIAL EXITS IN FINLAND AND THE UK

Combined and Inter-country Comparisons

Even though we urge caution in drawing comparisons between the two-data sets, the results reveal some interesting differences between the countries. All the country differences reported in this section (text and tables), if not otherwise stated, are based on cross-tabulations, for which chi-square tests have been run and the differences proved to be significant at least at the level of $p < 0.05$. A correlation matrix of the variables between the two countries is shown in Table 8.1. Exit reasons and perceived learning outcomes by country are shown in Table 8.2.

If we combine the results to examine specific characteristics of entrepreneurs, a correlation between the age of the entrepreneur when exiting and the exit reasons was found (Table 8.1). Business related exit reasons were slightly more common among younger entrepreneurs, whereas the positive, person related exit reasons were more common among older age groups. The latter is most probably due to retirement: over two-thirds of the entrepreneurs reporting positive exit reasons were waiting for retirement. On the other hand, younger business owners may have been more likely to experience lower levels of business performance and thus seek exit as a result of business reasons.

In the UK the entrepreneurs reported more business related exit reasons, both positive and negative, than in Finland. The share of business related exit reasons was 56 per cent among the exited British business-owners (36 per cent positive and 20 per cent negative business related reasons). In Finland person related exit reasons were more common (29 per cent negative and 22 per cent positive person related reasons).

If we now switch to examining perceptions of gaining new skills during their entrepreneurial career and business exit, some differences between the countries emerged. In general the UK respondents reported stronger skills development compared with the Finns (Table 8.2), although in both countries responses across all learning variables were most likely to be 'a bit better' or 'better'. UK respondents were positive about the impact of business exit across all skills development variables, whereas in Finland this was strongest in the field of entrepreneurs' self-management. The largest differences in perceived learning between the countries were found in relation to approaching markets and monitoring and management.

In this study we consider that an entrepreneur's encouragement to start anew is a reflection of their exit experiences. A statistically significant relationship between individual learning outcomes and respondents'

Table 8.1 Descriptive statistics and Spearman correlations for the variables

Variables	n	1	2	3	4	5	6	7	8	9	10	11	12
Background variables	688												
1. Country[1]													
2. Gender	687	0.203**											
3. Age when exiting business	685	0.054	−0.135**										
4. Educational level	677	0.008	0.151**	−0.116**									
Independent variables													
5. Exit reason: positive business related	688	−0.234**	−0.067	−0.110**	0.030								
6. Exit reason: negative business related	688	−0.152**	−0.006	−0.152**	−0.087*	−0.257**							
7. Exit reason: positive person related	688	0.095*	−0.061	0.305**	−0.006	−0.185**	−0.308**						
8. Exit reason: negative person related	688	0.294**	0.074	0.075	0.027	−0.175**	−0.291**	−0.210**					

9. Learning: approaching the markets	543	−0.207**	−0.019	−0.118**	0.013	0.080	0.005	−0.057	−0.095*				
10. Learning: monitoring and management	448	−0.255**	−0.050	−0.035	−0.004	0.118*	−0.005	−0.063	−0.048	0.586**			
11. Learning: E's self-management	626	−0.110**	0.054	−0.056	−0.063	0.088*	0.051	−0.074	−0.105**	0.417**	0.484**		
12. Financial state of the business	681	0.175**	0.018	0.124**	−0.044	0.031	−0.443**	0.286**	0.103**	0.027	0.050	0.011	
Dependent variable													
13. Encouragement	550	−0.045	−0.042	−0.096*	0.081	0.130**	−0.145**	0.018	−0.091*	0.244**	0.291**	0.334**	0.201**

Notes:
[1] UK = 1, Finland = 2.
** Correlation is significant at the 0.01 level (2-tailed).
* Correlation is significant at the 0.05 level (2-tailed).

Table 8.2 Exit reasons and perceived learning outcomes by country (%)

	Country		
Exit reasons	UK Yes	Finland Yes	All Yes
Negative business related reasons* **	**36**	**22**	**30**
Insufficient financial rewards	27	18	23
Business insolvent	2	0	1
Competition	1	2	1
Running out of operational funds	5	1	3
Risk	1	0	1
Business closed down	2	0	1
Taxation and legislation	0	2	1
Positive business related reasons* **	**20**	**4**	**13**
Had an idea for a different business	6	2	4
Breakdown in relationship with owners	15	3	9
Preferred being a sole trader	0	0	0
To form a partnership	0	0	0
Negative person related reasons* **	**7**	**29**	**17**
Stressfulness of the business ownership	5	5	5
Health problems	3	17	9
Lack of interest	0	7	3
Positive person related reasons*	**15**	**22**	**18**
Want to retire	11	16	13
Received an attractive job offer	5	6	5
	85	78	82
N	388	300	688
Perceived learning outcomes			
Approaching markets* **			
Worse	0	3	1
A bit worse	2	6	4
Not worse or better	27	36	31
A bit better	51	44	48
Better	20	10	16
Total	100	100	100
N	291	252	543
Monitoring and management* **			
Worse	0	2	1
A bit worse	1	9	4
Not worse or better	26	38	31
A bit better	55	45	50
Better	18	7	13
Total	100	100	100
N	249	199	448

Table 8.2 (continued)

	Country		
Perceived learning outcomes	UK Yes	Finland Yes	All Yes
Self-management†			
Worse	1	2	1
A bit worse	2	4	3
Not worse or better	24	29	26
A bit better	44	47	45
Better	28	19	24
Total	100	100	100
N	361	265	626

Note: *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$, † $p < 0.1$.

attitudes toward new entrepreneurial ventures after the exit was found. When analysing the original, five-scale variable of encouragement to start anew, we found that the UK respondents were more likely to report being encouraged to set up a new business and, thus, more likely to report positive exit experiences. However, the share that reported being discouraged was about the same in both countries.

The results indicate that the age of the entrepreneur when exiting, the reasons for exit and the perceived learning outcomes are associated with the entrepreneur's encouragement to continue as an entrepreneur after exit. As the correlations are modest, we need to be cautious when interpreting the results. In addition, higher correlations between different skills learnt suggest that entrepreneurs might not perceive the difference between approaching markets and monitoring and management, for example. However, as expected, the learning variables had high correlations with exit experiences and are, therefore, included in the further analyses. The nature of these associations is studied in more detail when modelling exit experiences.

Taxonomy of Exit Reasons and Experiences

In the following we switch from country comparisons and explore the taxonomy conceptualizing the exit reasons and exit experiences based on a combined data-set in order to enlighten the multifaceted phenomenon of entrepreneurial exit. Exit reasons and exit experiences form two dimensions and when negative and positive options of each are integrated a two-by-two matrix can be portrayed. As to exit experiences, 16 per cent of the respondents were discouraged by negative exit reasons, 43 per cent

were encouraged by negative exit reasons. On the other hand, 5 per cent were discouraged by positive exit reasons and, finally, 35 per cent of the respondents were encouraged by positive exit reasons. Some characteristics of the entrepreneurs belonging to each group and the financial state of the exited business are presented in Table 8.3. All the differences between the groups reported are based on cross-tabulations, for which the chi-square tests are run and the differences proved to be significant at least in the level of $p < 0.001$.

Exit experiences among entrepreneurs with negative exit reasons: interestingly, even if the business owner had exited due to negative reasons, they did not necessarily perceive the exit as a poor experience: while 27 per cent of them were discouraged, the majority (73 per cent) was still encouraged towards entrepreneurship. It appears that entrepreneurs who report negative reasons for exit are not deterred from pursuing future entrepreneurial activities. However, the share that reported being discouraged was also low among those who had positive exit reasons (12 per cent). Negative exit reasons were mostly business related (insufficient rewards). The most important person related exit reason was health problems. Perceived learning outcomes were greater in the group of encouraged entrepreneurs. In fact, the perceived learning outcomes among encouraged entrepreneurs with negative exit reasons were greatest in all learning dimensions among the four groups in the taxonomy. The average length of ownership in the exited companies among entrepreneurs with negative exit reasons was shorter (around eight to ten years) than among entrepreneurs with positive exit reasons (around 12–15 years). The financial state of exited businesses among entrepreneurs with negative exit reasons was worse than in other groups. This is quite natural as some negative exit reasons referred to financial problems of the businesses.

Exit experiences among entrepreneurs with positive exit reasons: only 5 per cent of the entrepreneurs reported both positive exit reasons and poor exit experience, that is, discouragement towards starting anew. Most of them had exited due to retirement; 86 per cent of them were over 45 years old, and they had gained a relatively long management experience in the exited firm. The exit reasons were mostly personal. Eighty-seven per cent of the ex-business owners who had exited due to positive exit reasons found the experience positive and were encouraged to continue as an entrepreneur. One-third of the group was waiting for retirement, one-third had exited due to breakdown in relationship with other owners and one-third had either had an attractive job offer or a different idea for a new business. This group was well educated – 80 per cent of them were educated above secondary level. The exited businesses were in the best financial shape among the encouraged entrepreneurs with positive exit

Table 8.3 Characteristics of the entrepreneurs in the taxonomy of exit reasons and experiences (n = 426)

Exit experience/ exit reason	Poor exit experience: discouraged from continuing as an entrepreneur	Good exit experience: encouraged to continue as an entrepreneur
Negative exit reason	Number of respondents: 69 (16%) Age when exiting: 29% under 45 years old Education: 70% higher than secondary Number of years of ownership (mean): 8.0 Exit reason: ⅔ business related, ⅓ person related Learning:[1] ● 42% learned operative business skills ● 35% learned planning and monitoring skills ● 38% learned self-development skills Financial state of business: 16% good or thriving	Number of respondents: 185 (43%) Age when exiting: 43% under 45 years old Education: 77% higher than secondary Number of years of ownership (mean): 9.6 Exit reason: ⅔ business related, ⅓ person related Learning:[1] ● 74% learned operative business skills ● 77% learned planning and monitoring skills ● 83% learned self-development skills Financial state of business: 21% good or thriving
Positive exit reason	Number of respondents: 21 (5%) Age when exiting: 14% under 45 years old Education: 67% higher than secondary Number of years of ownership (mean): 15.2 Exit reason: ¾ person related, ¼ business related Learning:[1] ● 42% learned operative business skills ● 18% learned planning and monitoring skills ● 42% learned self-development skills Financial state of business: 29% good or thriving	Number of respondents: 151 (35%) Age when exiting: 39% under 45 years old Education: 80% higher than secondary Number of years of ownership (mean): 12.3 Exit reason: ½ business related, ½ person related Learning:[1] ● 68% learned operative business skills ● 71% learned planning and monitoring skills ● 77% learned self-development skills Financial state of business: 53% good or thriving

Note: 1. Ratings 4 and 5.

reasons, 53 per cent of them were good or thriving. The entrepreneurs had learned much more than their discouraged peers, and almost as much as the encouraged entrepreneurs with negative exit reasons.

In short, based on the taxonomy, it can be stated that irrespective of exit reason, encouraged entrepreneurs, that is, those who reported a 'good' exit experience, tended to be younger, better educated, had a business that had been in better financial condition and claimed to have learned more than discouraged entrepreneurs. The taxonomy also demonstrates the multifaceted nature of entrepreneurial exit. Entrepreneurs exiting their businesses face different situations and exit reasons which are associated with their exit experiences, including learning, and the financial state of business.

MODELLING EXIT EXPERIENCES

We used hierarchical logistic regression to further explore the factors associated with exit experiences.

The Base Model

Given our aim to investigate different exit situations and reasons and their effects on the exit experiences of ex-entrepreneurs, particularly in relation to their subsequent intentions towards entrepreneurship, we entered the different background and independent variables in a block in the logistic regression. We created three models (A–C) (Table 8.4) explaining entrepreneurs' exit experiences as measured by her/his encouragement/discouragement to continue as an entrepreneur. To ensure the robustness of the model a multicollinearity diagnosis was applied. The variance inflation factors (VIF) of all the values of the first order terms were below 2.2, clearly below the critical values, indicating no multicollinearity in our data set (Hair et al. 1995). The control variables of country, gender, age and education were first entered in a base model A which fails to explain a statistically significant share of the variance of the exit experiences.

Independent Effects of Exit Reasons

In the next step, the independent effects of exit reasons were entered into the model. Model B makes a significant contribution over and above the base model ($\Delta R^2 = 0.078$, $p < 0.01$). Within this model, the findings suggest that negative, business related exit reasons have a statistically significant, negative influence on the positive exit experience. Since exp (b) is smaller than one, the model suggests that those individuals who had negative,

Table 8.4 Hierarchical logistic regression analysis: independent effects on encouragement to continue as an entrepreneur

Dependent variable: encouragement to continue as an entrepreneur (exit experience)	A Exp (b)	B Exp (b)	C† Exp (b)
Exit reason: positive business related		2.577	2.603
Exit reason: negative business related		0.354*	0.364*
Exit reason: positive person related		0.674	0.958
Exit reason: negative person related		0.481	0.704
Learning in approaching markets			1.045
Learning in monitoring and management			1.653†
Learning in self-management			2.754***
Country	0.808	0.911	1.433
Gender	0.777	0.787	0.700
Age when exiting	0.908	0.912	0.925
Education	1.062	1.008	1.017
Constant	7.267**	12.870***	0.030*
n (valid in analysis)	342	342	342
Nagelkerke R^2	0.01	0.078*	0.287***
ΔR^2		0.078**	0.209***

Notes:
Logistic regression, enter: † $p<0.10$, * $p<0.05$, ** $p<0.01$, *** $p<0.001$.
† The proportional by chance accuracy rate was exceeded by 14%.

business related exit reasons from their latest firm, perceived more negative exit experiences than those who did not have a negative business exit reason. However, negative person related exit reasons had no statistically significant influence on one's exit experience.

According to the model there is no evidence that other exit reasons or nationality, gender, age when exiting or educational level had a statistically significant direct relationship with entrepreneurs' exit experience. Neither business related nor personal positive exit reasons had a statistically significant relationship with entrepreneurs' exit experiences.

Independent Effects of Exit Reasons and Learning

In the next step, model C, we included the independent effects of learning dimensions. Model C makes a significant contribution over and above model B, the explained variance increases by 0.209 (to 0.287) and the

increase is statistically significant at $p < 0.001$. Within this model, the findings suggest that learning in self-management increases the odds of perceiving entrepreneurial exit in a positive way. Every increase of one scale level to another in the variable increases the odds of positive perception of exit experiences almost three times. There is also a statistically indicative association between learning in monitoring and management and positive exit experience. Thus, based on the model C the perceived learning outcomes of an entrepreneur are associated with positive exit experiences.

DISCUSSION AND CONCLUSIONS

This chapter has explored entrepreneurial exits in Finland and the UK. The focus was on exited entrepreneurs' perceptions of the different exit situations, the reasons and their effects on their exit experiences, particularly in relation to their subsequent intentions towards entrepreneurship. Additionally, in order to enlighten individual exit experiences, we explored what kind of skills and capabilities entrepreneurs had acquired during the exited business. The study looked at the phenomenon from an individual perspective – something which until recently has been absent in the literature. Thus, the chapter contributes to the growing evidence base on entrepreneurial exits in relation to people and their learning experiences.

Based on the extant literature we formed a taxonomy conceptualizing entrepreneurial exit. This has been explored using Finnish and the UK data. In our study exit reasons and experiences are depicted in Figure 8.1.

The majority of the respondents (43 per cent) belong to the group 'Learners and fighters' who report good exit experiences despite negative exit reasons. They report having learnt the most. The study also shows that, in the process of running a business, learning does take place. Where learning is strong, this is associated with good exit experiences despite negative exit reasons. This confirms previous research that entrepreneurs not only learn by doing but also while coming through difficulties (for example, McGrath 1999). The second largest group (35 per cent) includes those entrepreneurs with good exit experiences and positive exit reasons. These entrepreneurs want to perform better and differently in the future with their businesses. They have learnt a lot and are willing to exploit the learning in their future entrepreneurial endeavours.

The entrepreneurs in the third group exited mostly due to lack of financial rewards and health and accordingly they had poor exit experiences

Exit experience / Exit reason	**Poor** (Discouraged from continuing in entrepreneurship)	**Good** (Encouraged to continue in entrepreneurship)
Negative exit reasons (personal & business related)	Lack of financial rewards and health	Learners and 'fighters'
Positive exit reasons (personal & business related)	Other viable options available	Positive experience and open to changes

Figure 8.1 Taxonomy of exit reasons and experiences

(16 per cent). This group is most unlikely to re-enter entrepreneurship: they are neither willing nor capable. Finally, the smallest group of entrepreneurs (5 per cent) was discouraged by the exit despite positive exit reasons as they had other viable options, such as other work opportunity or retirement. This is in line with previous research suggesting that the boundaries between entrepreneurship and waged work are blurring and the decisions to enter or exit from entrepreneurship are taking place in a wider labour market context (Akola et al. 2007). Therefore, it is important to set the role of entrepreneurship within broader career perspectives and in different labour market contexts. During their life course individuals accumulate skills and personal reputation as key career resources, by frequent movements between firms and in and out of self-employment and job opportunities that extend over single employment (see Dyer 1994).

When comparing entrepreneurial exits in the UK and Finland some differences were found, especially in relation to the exit reasons and skills development. This indicates that cultural issues and business environment might somehow influence exit experiences and entrepreneurial exits. This topic clearly needs to be further studied.

We found out that there is a statistically significant association between entrepreneurs' perceived individual learning outcomes and exit experiences. Most entrepreneurs, who had exited their businesses,

reported experiencing some learning and have used these experiences during their future career either as an entrepreneur or in employment. Therefore, business exits should not be considered as a failure. Interestingly, it seems that those with good exit experiences seem to have learnt most. Indeed, our taxonomy of exit reasons and exit experiences revealed that the learning outcomes of entrepreneurs in different groups differed significantly, suggesting that learning might have a moderating or mediating effect on exit experiences. This finding also deserves further research.

However, our study has its limitations. First, the data was not gathered at the same time in the countries. Hence, the different economic cycles, for example, may have influenced the observed results although there was nothing outstanding in aggregate at the timing of the data collection. Second, the data were based on entrepreneurs' perceptions, that is, self-reporting rather than external measurements of skill development or learning (see Frankish et al. forthcoming). Third, the data is cross-sectional and relied on recall which cannot be externally corroborated. Finally, the data does not include any information on how national legal systems may affect entrepreneurial exits (see Wennberg et al. 2009).

Nevertheless, the results contribute to a growing literature on different types of entrepreneurial exits, their effects on individuals' learning and ex-entrepreneurs′ future labour market aspirations. The taxonomy presented is derived from the data collected. This conceptualizes and classifies different types of entrepreneurial exits, the experiences and consequences of different reasons for exit. From a policy perspective the results suggest that it is important to understand different types of entrepreneurial exits. Most of the entrepreneurs behind entrepreneurial exits have the potential to become even more successful entrepreneurs as suggested by theories on entrepreneurial learning. Our findings suggest that the potential is greater among younger and well-educated individuals whose businesses were in a better financial state. Accordingly, policy-makers may wish to focus on facilitating and even speeding up the business transfer or closure process. This may be achieved by reducing their costs as the material impacts of closure (that is, financial loss) negatively affect exit experiences and, finally, subsequent business entry. On the other hand, there are also groups of entrepreneurs who cannot or are not willing to pursue entrepreneurial opportunities after their exit experience, regardless of the policy measures. Ultimately, the chapter adds weight to the growing evidence base that business exit should no longer be regarded as something that is undesirable or narrowly associated with negative effects.

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APPENDIX

Table 8A.1 The results of a factor analysis: skills improvement (Varimax rotated solution)

Learning in the following fields of knowledge while running the exited business	Learning factors			
	LF1	LF2	LF3	Communalities
Developing business networks	.647			0.507
Building customer base	.737			0.610
Identifying new opportunities	.725			0.612
Researching the market	.679			0.548
Promoting products/services	.762			0.684
Targeting customers/clients	.755			0.645
Team leadership	.395	.436	.419	0.521
Attracting/retaining staff	.430	.585		0.554
Planning the business	.495	.574		0.607
Financial record keeping		.752		0.611
Raising finance		.630		0.462
Monitoring performance	.323	.650		0.593
Coping with setbacks			.777	0.674
Self-management			.772	0.699
Adapting to change			.779	0.708
Eigenvalue	6.692	1.312	1.030	
% of variance	26.58	17.66	15.99	
Cronbach Alpha for the sum variables	0.87	0.82	0.78	

Note: Extraction Method: Principal Component Analysis. Respondents are included in the analysis pairwise. Component loadings less than 0.30 are suppressed. The displayed 'explained variance' and Eigenvalue are after varimax rotation. Cumulative variance explained is 60%. KMO = 0.93. Barlett's test approx. $Chi^2 = 3225$; d.f. 105; $p < 0.001$. Learning factors (LF) were named as LF1 Approaching the markets; LF2 Monitoring and management; LF3 Self-management.

9. The virtualization potential of SME networks: an exploratory investigation

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INTRODUCTION[1]

In Italy during the 1970s and 1980s, networks of small and medium-sized enterprises (SMEs), such as enterprise clusters and industrial districts, offered an important alternative to the advantages achieved through a larger production scale in many countries and industries. However, in more recent decades uniform growth in SME networks has come to an end. In order to respond to competitive challenges, local SME networks have experimented with new development paths, and the range of options has significantly expanded. Traditional unidirectional development paths have no longer proved valid, and various avenues have been pursued to face up to market globalization. Accordingly, on discussing the future of industrial districts, Becattini et al. (2003) recognized that this organizational form of SMEs has often proved to be rather a 'stage' in one of the possible different paths of industrialization.

The radical changes that have occurred in the competitive scenario in recent years have driven small firms to seek new development paths in order to cope with the growing complexity of the business environment and to ensure access to new sources of competitive advantage (Davenport and Short 1990; Manuelli 2002). In this new scenario, many studies have stressed firms' opportunities to redesign processes and business organizations through electronic networks on a worldwide scale (Jin and Robey 2008; Scott Morton 1991; Tapscott 1996). By focusing on the gains in efficiency stemming from the electronic management of business processes, physical proximity and localization have become less important.

According to the recent literature and current business practice, small firms are seeking new forms of collaborative relationships with a higher degree of decisional and operational flexibility, in order to satisfy customer

demands faster and at a lower cost. One of these emerging organizational forms is the virtual enterprise (VE) (see, for example, Davidow and Malone 1992; Thompson, 2008).

In this model, information and communication technology (ICT) is considered the driver of local SME network competitiveness. Specifically, ICT solutions are considered a powerful tool to enhance local innovation processes towards global networks. Electronic networks may increase the value of a firm's capacity to develop a high level of local expertise and specialized knowledge by enlarging its domains on a global scale. Major consequences for local SME networks may derive from the advent of the VE model. Information technologies can develop the local systems by enlarging their boundaries, so that they can manage more independently relations with their suppliers and with the final market, and share specific knowledge that is useful to the whole value-chain system.

Despite increasing academic interest in this organizational form, it is still not clear whether the VE model may be considered a possible response to the greater complexity and instability of today's business environment. Moreover, since a number of definitions of VE have been suggested, it is not clear whether there is a unique organizational form or there are a variety of VE models presenting shared characteristics (Cunha and Putnik, 2006). In addition, although existing empirical studies mainly focus on traditional forms of collaboration among firms (such as supply chain and industrial districts), the evolutionary paths that allow firms to move from traditional forms to the VE model have not been fully explored. Finally, even if this topic has been dealt with extensively, there is little empirical research investigating real cases of VE (De Sanctis and Monge, 1999).

There are two main objectives of this chapter. The first is to ascertain whether it is possible to identify a unique VE model, or a framework that includes a variety of VE models through analysis of recent literature. The second objective is to contribute to plug the gap in the empirical research with a field analysis focused on a network of SMEs. From an empirical point of view, the chapter analyses a network of small and medium-sized firms located in the eastern area of Naples (ENES), through a questionnaire survey in order to assess whether the network is evolving towards the VE model.

The chapter is organized into eight parts. This introduction is followed by a literature review on the virtual enterprise. The third section identifies different VE models on the basis of findings derived from the previous section. The fourth section describes the research context. The methodology used to carry out the survey is detailed in the subsequent section. In the sixth section the findings emerging from the empirical analysis are

presented and discussed. Next, the empirical and theoretical results are jointly discussed. Finally, conclusions and implications are outlined.

THE THEORETICAL FRAMEWORK

In the past few years, the competitive scenario has witnessed dramatic changes. These changes may be summarized as follows (Esposito et al. 2008):

1. Growing *market globalization and competition* which has increased the rate in new product introduction and reduced their life cycle.
2. New *customer requirements*, resulting from the demand for products with greater customization, higher quality and lower delivery times.
3. New *social conditions* arising from increasing environmental awareness and legal pressures.
4. *Acceleration in the rates of technology diffusion and adoption*, with particular reference to ICT.

In facing this new scenario, firms concentrate on 'core competencies' (Hamel and Prahalad 1990). Simultaneously, businesses are exploring new organizational models that better fit the conditions of the new competitive scenario. Such conditions force firms to adopt inter-enterprise formations following new organizational models. The search for developing new organizational approaches has to satisfy two elements: organizational structures need to be more flexible to allow swift adaptation to change (Pollalis and Dimitriou 2008), and firms need to use technological tools for knowledge management (KM) such as ICT (Iandoli and Zollo 2007; Preiss et al. 1996). These technologies offer wider access to information and knowledge and allow firms to manage collaborative relationships more efficiently and effectively.

The debate on new organizational forms has suggested the virtual enterprise (VE) as a responsive model to address changing market conditions through flexibility and KM. The substantial literature published on this subject shows the extensive use of the term 'virtual'. The review reported below provides a spectrum of the main aspects and features that underlie the concept of the virtual enterprise model. In the late 1980s the term 'virtual corporation' first appeared, referring to links between companies supported by ICT. The concept of VE was mainly technology driven and based on the sharing of information systems. One of the first definitions of VE was given by Byrne (1993) who indicated the temporary nature of

relationships in the network of independent companies belonging to VE managed through information technology. The main aims of VE relate to sharing skills, costs and to access one another's markets.

Although Jagdev and Browne (1998) identified the same characteristics and aims, they stressed two additional important elements, namely the project-based approach and the relative shorter life span in comparison with the extended enterprises model. Zhang et al. (2000), Camarinha-Matos et al. (2001), Mikhailov (2002) and Kim et al. (2006) proposed a similar view in relation to VE. Mezgar et al. (2000) suggested that a VE may be considered as a holarchy given that it is a temporary and goal-oriented aggregation of several individual enterprises. The authors also underlined that a VE is created to pursue a specific business objective, and it remains in life as long as this objective is being pursued. Choy and Lee (2001) introduce the concept of a VE as a network of value-adding services in a supply chain, which combine for a specific period of time for a specific business objective and disband when the goal is achieved. Martinez et al. (2001) also found that the VE concept may be used to characterize the global supply chain of a single product in an environment of dynamic networks between companies engaged in many complex relationships. In their view, the main objective of a VE is to rapidly develop a common working environment and manage a pool of resources provided by the participating organizations towards the attainment of common goals. Hence, success of the VE depends on all partners cooperating as a single unit.

For Presley et al. (2001) the VE is a form of joint venture with the following substantial differences: (1) it is designed to be a temporary alliance among the member companies to take advantage of a market opportunity; (2) each member organization provides its own core competencies in organizational functional areas such as marketing, engineering and manufacturing; (3) a small headquarters staff is required to deal with the administrative and management details; (4) geographically separated shareholder companies, subcontractors, and partners are linked through computerized hardware and software; and (5) when the market opportunity has passed, the VE is dissolved. As pointed out by Lefebvre and Lefebvre (2002) and Fenga and Yamashiro (2006), a VE may be created by multinational companies that are responsible for complex products and act as product integrators. They also stress that a VE is often a temporary group of several actors, all operating on the same informational platform. These actors do not generally belong to the same enterprise and are not necessarily located on the same continent.

Park and Favrel (1999) argued that the VE model allows the gap between large and small firms to be bridged. Hence it may be considered

a suitable organizational model for SMEs (Wu and Sun 2002). Thompson (2008) pinpointed that a VE is a voluntary and dynamic community of SMEs that undertake to work together for a set period of time and collectively to seek opportunities to participate in collaborative projects of mutual business interest.

The view proposed by Corvello and Migliarese (2007) pointed out that in a VE arrangement partners are integrated in a productive system which is based on mutual adjustment processes supported by ICT. The authors indicated that, compared with vertically integrated firms, the VE model substitutes hierarchy with incentives, and formal and procedural coordination with complex communication systems. Finally, Gunasekaran et al. (2008) argued that a VE is based on developing partnerships based on core competencies for achieving agility in a supply chain environment. They showed that virtual enterprises are highly dynamic and have several strategic objectives: (1) to maximize flexibility and adaptability to environmental changes, (2) to develop a pool of competencies and resources, (3) to reach a critical size to be in accordance with market constraints and (4) to optimize the global supply chain.

What emerges from the literature review is that (a) there are a number of common issues related to the VE concept and (b) there are also important issues that are not fully addressed by the literature. An overview of both shared and non-shared issues is outlined in Table 9.1.

In relation to the issues covered by the literature on the subject, the first shared issue identified relates to the main aims of VE that mainly focus on exploiting fast-changing market opportunities. The main objectives of partnership between VE participating companies are the sharing of risks, costs and competencies. The virtual enterprise appears as a dynamic and flexible network, and relationships involve independent companies. Such relationships are typically temporary and based on a collaborative approach. Finally, the coordination and communication tools used are based on ICT. These five issues may be considered the common foundations of the theoretical concept of the VE model.

Nevertheless, the literature review highlighted a number of issues that are not fully shared. The most relevant non-shared issues relate to the organizational model and coordination mechanisms. The literature does not indicate a prevalent VE organizational model. Two different views emerged in terms of hierarchical or non-hierarchical structures. On the one hand, in the hierarchical approach the VE is created by large firms which act as a coordination unit of the network. On the other hand, an alternative approach proposes the self-organization of VE members based on the substitution of hierarchy with incentives and formal/procedural coordination with communication systems.

Table 9.1 Overview of literature review findings

	Literature evidence
Shared issues	
Main aims	Exploit fast-changing opportunities (Jagdev and Browne, 1998; Park and Favrel, 1999; Mezgar et al., 2000; Choy and Lee, 2001; Presley et al., 2001; Jagdev and Thoben 2001; Mikhailov, 2002; Wu and Sun 2002; Lefebvre and Lefebvre, 2002; Kim et al., 2006; Corvello and Migliarese, 2007)
Partnership objectives	Share costs, skills, and core competencies (Jagdev and Browne, 1998, Park and Favrel, 1999; Camarinha-Matos et al., 2001; Martinez et al., 2001; Choy and Lee, 2001; Presley et al.. 2001; Mikhailov, 2002; Wu and Sun 2002; Fenga and Yamashiro, 2006; Corvello and Migliarese, 2007; Gunasekaran et al., 2008)
Organization stability	Flexible, rapid, dynamic and reactive network (Park and Favrel, 1999; Mezgar et al., 2000; Camarinha-Matos et al., 2001; Martinez et al., 2001; Lefebvre and Lefebvre, 2002; Kim et al., 2006; Corvello and Migliarese, 2007; Gunasekaran et al., 2008)
Partnership characteristics	Temporary relationships (Jagdev and Browne, 1998; Choy and Lee, 2001; Camarinha-Matos et al., 2001; Jagdev and Thoben 2001; Wu and Sun 2002; Lefebvre and Lefebvre, 2002; Mikhailov, 2002; Fenga and Yamashiro, 2006; Kim et al., 2006; Corvello and Migliarese, 2007; Gunasekaran et al., 2008; Thompson, 2008) Collaborative; co-operative (Jagdev and Browne, 1998; Jagdev and Thoben 2001; Mikhailov, 2002; Fenga and Yamashiro, 2006; Kim et al., 2006; Gunasekaran et al., 2008; Thompson, 2008) Independent companies (Jagdev and Browne, 1998; Jagdev and Thoben 2001; Lefebvre and Lefebvre, 2002; Mezgar et al., 2000; Mikhailov, 2002; Corvello and Migliarese, 2007)
Coordination and communication tools	Extensive use of ICT and computer networks (Jagdev and Browne, 1998; Park and Favrel, 1999; Camarinha-Matos et al., 2001; Mezgar et al., 2000; Jagdev and Thoben 2001; Mikhailov, 2002; Wu and Sun 2002; Lefebvre and Lefebvre, 2002; Martinez et al., 2001; Corvello and Migliarese, 2007; Gunasekaran et al., 2008)
Non-shared issues	
Coordination unit	Coordination agent may be both internal and external to VE (Jagdev and Browne, 1998) Small headquarters staff dealing with administrative and management details (Presley et al., 2001)

Table 9.1 (continued)

	Literature evidence
	The product integrator distributes the manufacturing tasks and manages in parallel the product's physical and virtual value chains (Lefebvre and Lefebvre, 2002; Fenga and Yamashiro, 2006)
Firm size	VE model bridges the gap between large and small firms (Park and Favrel, 1999) VE is especially suitable for small and medium-size enterprises (Wu and Sun 2002) VE is a voluntary and dynamic community of SMEs (Thompson, 2008)
Knowledge management	KM critical resource to achieve competitive advantage in VE (Pollalis and Dimitriou, 2008; Blecker and Neuman, 2000).
Organizational structure	VE members self-organise their activities (Mezgar et al., 2000) The relationship in a VE is mostly non-hierarchical in nature (Jagdev and Thoben, 2001) VE organizational structure is mostly hierarchical (Fenga and Yamashiro, 2006) A VE substitutes hierarchy with incentives and formal and procedural coordination with communication systems (Corvello and Migliarese, 2007)
Market relationships	Customer deals directly with the product integrator during product design or may interface with it through business platforms (Lefebvre and Lefebvre, 2002) The manufacturer manages the relationships with customers (Jagdev and Browne, 1998)

The role of firm size in the VE context is generally underestimated. Few works indicate that virtualization is particularly suitable for SMEs. This seems to be a gap that needs to be addressed as many industrial systems in developed countries are populated by a large number of small company aggregations, as in the case of Italian industrial districts. Moreover, the literature seldom refers to the increasingly important role of knowledge and knowledge management systems in the context of VE. Finally, it is not clear which specific participating company manages the relation with the final user of the product/service. These five non-shared issues may be considered the distinctive characteristics of VE models.

HIERARCHICAL VERSUS HOLARCHICAL VE MODELS

The literature review presented above identifies a number of common and specific issues that contribute to provide a comprehensive picture of the theoretical concept underlying the VE model. Considering the issues that are not shared by the literature, particularly issues of organizational structures and coordination mechanisms, it is possible to identify at least two extreme VE models: the hierarchical and holarchical[2] models (see Figure 9.1).

In order to clarify the main differences between the hierarchical and holarchical models, in Table 9.2 the distinctive features of the two models have been summarized and compared.

In the case of the hierarchical VE model, a leader company (generally a large firm) allocates the manufacturing tasks among partners sharing resources and costs (Fenga and Yamashiro 2006). The leader company assumes the task of coordinating the entire network of firms (Lefebvre and Lefebvre 2002) and manages the knowledge and information flows. This company also acts as product integrator, as it is responsible for the final product/service and relationship with the customer.

By contrast, the holarchical VE model has no hierarchical coordination unit. The self-organization approach is the main coordination mechanism (Mezgar et al. 2000), based on mutual adjustment processes (Corvello and Migliarese 2007). The holarchical model appears particularly suitable for

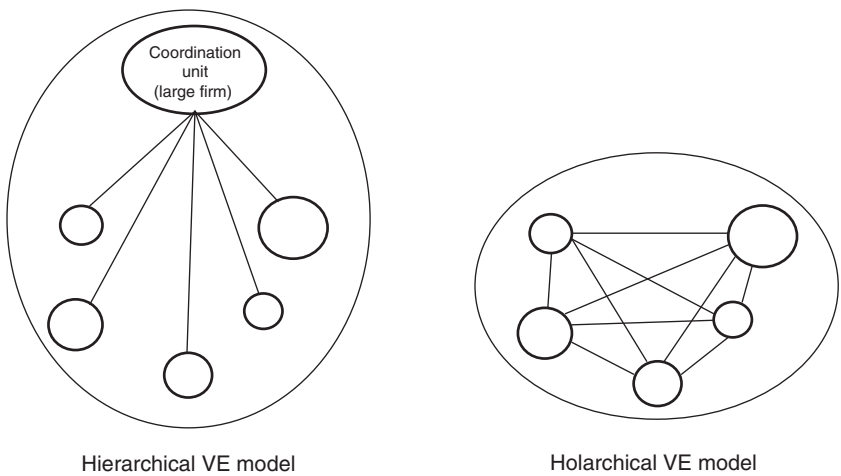

Figure 9.1 Two extreme VE models

Table 9.2 Comparison between the hierarchical and holarchical VE models

Issues	Hierarchical VE	Holarchical VE
Coordination unit	A large firm coordinates the network	No coordination unit
Firm size	Both large firm and small firms	Mainly SMEs
Organizational structure	Generally defined by the coordinator Predominantly vertical relationships	Self-organization Mainly horizontal relationships Mutual adjustment processes
Knowledge management	Knowledge flows are managed and integrated by the coordinator	Knowledge flows are distributed and need integration
Market relationships	The coordinator manages customer relationships	The product/service integrator manages customer relationships

SMEs but knowledge and information flows need to be integrated as there are differences in information systems used. Finally, due to the lack of a leader firm, the success of this type of model strictly depends on all partners cooperating as a single unit (Park and Favrel 1999).

In order to provide empirical evidence of the VE adoption model in SME networks, a questionnaire survey was carried out in a set of small firms operating in service and manufacturing industries. The findings emerging from the survey provide empirical evidence and quantitative support for estimating the virtualization potential of SME networks.

STRUCTURAL CHARACTERISTICS OF THE EAST NAPLES HIGH-TECHNOLOGY ENTERPRISE SYSTEM

The East Naples high-technology enterprise system (ENES) is an association of 25 SMEs established in March 2007. The main objective of ENES is to integrate firm resources and competences in order to capture market opportunities. The ENES mainly consists of SMEs as shown in Table 9.3. In Table 9.3, the latest SME definition proposed by the EU Commission is used (European Commission 2005). The total number of ENES employees is about 3000 people and the total turnover is about 400 million euros. The total turnover increased by 28 per cent in the period 2004–07, and this led to a 21 per cent growth in investment in the same period. The ENES firms

Table 9.3 ENES company breakdown by employees

Employee bands	Number	Percentage
Micro (0–9 employees)	3	12%
Small (10–49 employees)	10	40%
Medium (50–249 employees)	11	44%
Large (≥ 250 employees)	1	4%
Total	25	100%

operate in different manufacturing and service industries. They have a set of specific and different competencies as shown in Table 9.4. In Table 9.4, ENES companies are indicated with the capital 'F' letter followed by a progressive number.

The first six columns relate to manufacturing competencies such as: mechanical processing, aircraft precision processing, aeronautical assembly, electric (electronic) wiring and assembly, equipment and maintenance. The last five columns describe the competencies held by service firms such as: software development, management consulting services, training services, logistic services and specialized services. The number of competencies per company ranges from 1 to 4 (mean 2.54). A number of firms possess a single competence (6 firms) showing a high level of specialization. The remaining firms have a higher degree of diversification as they have more than one competency.

Table 9.5 reports the customer sectors served by ENES firms. The main sectors served are: aerospace, automotive, railways, telecommunications (TLC), information and communication technology (ICT), energy, construction, public administration, banking and others. The figure shows that most of the companies serve the aerospace and TLC sectors. The number of customer sectors served per firm ranges from 1 to 4 (mean 2.4). Approximately, one-third of firms serve a single customer sector, showing a high degree of business risk concentration. Most of these firms operate in the aerospace sector.

In Tables 9.4 and 9.5, it is interesting to note that firms with complementary competencies (for example, software development and training) are able to serve different markets. On the other hand, there are a number of firms with specialized competencies that are able to serve a few customer sectors. This is the case of small firms operating in the aerospace sector. These companies often act as subcontractors for larger firms.

Table 9.4 Competencies of the sample firms

Compe-tencies / Firms	Manufacturing						Service					Total
	Mechanical processing	Aircraft precision processing	Aeronautical assembly	Electric (electronic) wiring and assembly	Equipment	Maintenance and service	SW development	Management consulting	Training	Logistic services	Specialized services	
F1	x				x	x						3
F2		x				x				x	x	4
F3	x											1
F4		x		x							x	3
F5	x	x	x									3
F6		x	x			x					x	4
F7		x	x		x	x						4
F8				x		x						2
F9	x					x					x	3
F10	x			x								2
F11							x				x	2
F12							x					1
F13				x			x		x			3
F14						x	x		x		x	4
F15							x					1
F16								x				1
F17							x	x	x			3
F18											x	1
F19								x	x			2
F20							x	x	x		x	4
F21								x	x		x	3
F22											x	1
F23				x		x					x	3
F24							x		x	x	x	4
F25							x				x	2
Total	5	5	3	5	2	8	9	5	7	2	13	64

SURVEY METHODOLOGY

After reviewing the current literature on VE, a questionnaire survey was conducted. The literature review allowed for better understanding of the relevant aspects to be analysed in the questionnaire survey. The main aim

Table 9.5 Customer sectors served by the sample firms

Firms \ Customer sectors	Aerospace	Automotive	Railway	TLC	ICT	Energy	Construction	Public administration	Bank	Others	Total
F1	x										1
F2	x										1
F3	x	x								x	3
F4	x										1
F5	x										1
F6	x										1
F7	x										1
F8							x			x	2
F9	x	x				x				x	4
F10			x	x							2
F11	x			x							2
F12	x			x	x						3
F13	x	x	x	x							4
F14				x	x			x	x		4
F15	x			x	x			x			4
F16	x			x	x						3
F17				x				x		x	3
F18	x	x									2
F19	x	x						x			3
F20					x			x	x	x	4
F21	x			x				x			3
F22				x			x	x			3
F23			x								1
F24	x		x							x	3
F25				x							1
Total	17	5	4	11	5	1	2	7	2	6	60

of the survey was to assess whether the ENES is evolving towards the VE model. The survey was organized into the following five steps:

1. *Definition of basic survey objectives and preparation of the draft questionnaire*. In this phase a draft version of the questionnaire was prepared together with the definition of the basic survey objectives.
2. *Establishment of focus groups*. In order to test the suitability of the basic survey objectives and comprehensibility of the draft questionnaire, a focus group of eight experts with different competence and professional

background was established. The group was developed in three different phases. First, the topic investigated was presented in order to familiarize focus group participants. Secondly, the draft questionnaire was submitted to the panellists to obtain useful feedback and comments. Finally, panellists' remarks were discussed in a plenary session.

3. *Re-focusing of survey objectives and questionnaire*. On the basis of feedback received during the focus group discussion, the questionnaire was finalized. The final version of the questionnaire consisted of 60 questions divided into the following nine sections: company profile; knowledge management; products/services realized; customers; firm relationships; technological assets and research and development (R&D) activity; strategy; human resources management; and quality management. Most of the questions included in the questionnaire are based on a Likert scale ranging from 1 to 9. Some other questions allowed more open-ended responses in order to allow respondents to express their own personal opinion.
4. *Testing the questionnaire*. In this step, the final version of the questionnaire was tested in three pilot interviews carried out in ENES firms.
5. *Survey implementation*. The survey was conducted in spring 2008. The total number of respondents was 18 out of 25 companies with a response rate of 72 per cent. The questionnaire was administered during face-to-face interviews involving at least two managers with different skills and role (for example, a manager involved in the firm's strategic decision-making process and a manager involved in operations management). This allowed both strategic and operational perspectives to be obtained.

In order to have a more comprehensive picture of the East Naples high-technology enterprise system, information from complementary sources (for example, company websites, company reports and industry magazines) were collected and analysed. However, it is worth noting that due to the small sample of firms investigated, the survey results presented in the next section cannot be generalized. From this point of view, the survey must be considered exploratory in nature. Nevertheless, the survey provides a contribution in enlarging the knowledge on the virtualization of SME networks that is a relatively new and little investigated phenomenon.

MAIN SURVEY FINDINGS

This section presents some of the findings emerging from the field analysis. In order to compare the main results of the literature review with the

Table 9.6 Relationships among ENES firms

	F1	F2	F3	F4	F5	F6	F7	F8	F9	F10	F11	F12	F13	F14	F15	F16	F17	F18	F19	F20	F21	F22	F23	F24	F25	Total
F1						x	x				x															3
F2						x																				1
F3				x		x					x														x	4
F4			x			x			x											x					x	5
F5																							x			1
F6	x	x	x	x			x												x							6
F7	x					x																				2
F8																										0
F9				x													x		x							3
F10											x												x			2
F11	x		x							x							x	x	x						x	7
F12																					x				x	2
F13														x	x		x					x				4
F14													x		x		x				x	x			x	6
F15													x	x									x			3
F16																										0
F17									x		x		x	x											x	5
F18											x															1
F19						x			x		x															3
F20				x																	x					2
F21												x		x						x		x				4
F22													x	x							x					3
F23										x					x											2
F24					x																					1
F25			x	x							x	x		x			x									6

empirical evidence obtained from the survey, the results presented here only refer to the following sections of the questionnaire: section E (firm relationships) and section B (knowledge management).

Firm Relationships

In this section the relationships among the ENES firms are analysed, with the results summarized in Table 9.6. The figure may be considered a snapshot of relationships among the ENES firms. The symbol 'x' indicates that there is a relationship in place between two companies. In most cases this means that the two companies are involved in a collaborative project. Blank columns (or rows) refer to firms that are not involved in any collaborative relationship/project. The number of inter-firm relationships ranges between 1 and 7 (mean 3.04).

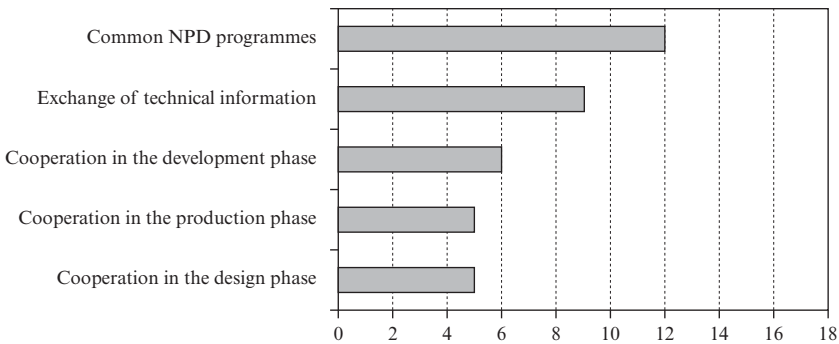

Figure 9.2 Nature of relationship among ENES firms

As regards the nature of relationships among ENES firms, the number of firms engaged in different types of collaboration is indicated in Figure 9.2. The most frequent forms of relationships concern shared new product development (NPD) programmes and exchange of technical information. Relationships in the production, design and development phase account for only a limited percentage. In order to provide a more detailed picture of collaboration within the ENES, the main projects undertaken by some ENES firms are shown in Table 9.7. In such projects, the proposer firm does not always coordinate the project: coordination is sometimes entrusted to another ENES firm involved in the partnership.

Most of the projects listed in Table 9.7 concern the TLC and aerospace sectors. According to the competencies required, each project may be considered a potential VE involving ENES firms. Indeed, the development of collaborative projects is the main objective of the partnerships in the VE model. This makes ENES a suitable context for the creation and implementation of VEs. To sum up, the ENES may be considered an association among peers that represents a potential pool of VEs.

Knowledge Management

In order to develop collaborative projects, companies generally adopt knowledge and information management tools. Hence the usage of KM Systems (KMSs) was explored in the context of ENES firms. First, the survey indicated that 15 firms of the sample have a KMS in place (see Figure 9.3).

The vast majority of these companies (11) adopt an internal system aimed at supporting KM within the firm. Systems supporting the internal and external KM flows are implemented only in four firms. The most

Table 9.7 Some ENES collaborative projects

Project name	Project description
Electric aircraft	Mixed electric propulsion aircraft
KA-2H	Innovative helicopter
SAC	Composite anti-crash system for helicopters
SAEG	Steering electric innovative system
RTA	Advanced coverings for aircraft industry
IRENE	Space capsule for picking up cosmic dust
SPA	Advanced system for satellite antenna polymerization
HM&M	Health monitoring and management systems for space aircraft
FSL-EC	Study of human–computer interaction systems
LBB – Liquid Bag Buffers	Development of liquid bag buffer systems for innovative bearing
HPF	Heat pipes for space vehicle control
3D Modelling	Real-time 3D model capture system
Tele-medicine	System for telemedicine and remote medicine using satellite system
SIGRI	Information system for monitoring and control of forest fires

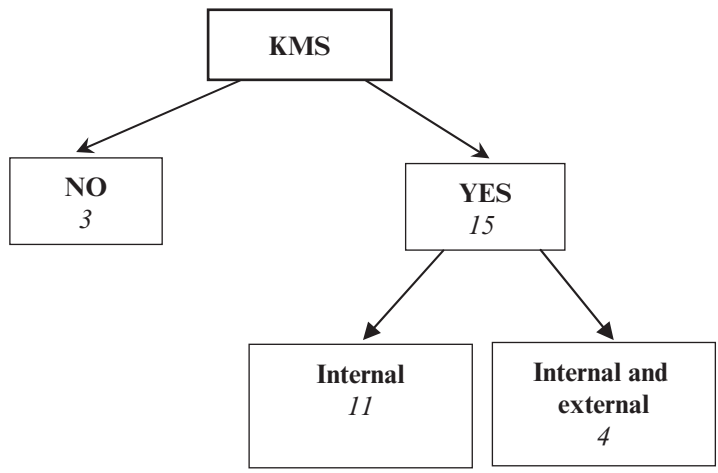

Figure 9.3 KMS adoption in the ENES

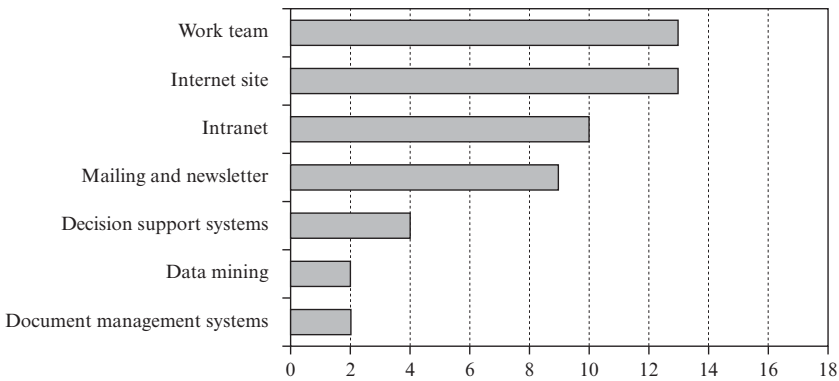

Figure 9.4 Internal forms of KMS implementation

widespread forms of internal KMS implementation (see Figure 9.4) are through the Internet site, work teams (13 firms out of 18) and the intranet (10 firms).

The great importance attached to work teams is proof that in high-technology sectors, in addition to ICT, interactions and interpersonal relationships are a fundamental tool for problem solving. In this context, it is worth distinguishing between services and manufacturing firms. Service firms operating in the telecommunications, ICT and aerospace sectors generally use advanced and structured KMSs equipped with a document management system, data mining, decision support systems and dedicated work teams. By contrast, manufacturing firms working in the aerospace sector as sub-suppliers use a less structured KMS for the purpose of management control and business resource management.

Although only four firms use internal and external KMSs, each surveyed firm hoped for wider KMS embracing the entire ENES. For this reason, the benefits of a KMS serving the entire network of the ENES were analysed (see Figure 9.5). In the figure the average value of the responses for each expected benefit is reported.

Figure 9.5 shows that a KMS serving the entire ENES may have a positive impact, not only on innovation and on operational management, but also on identification of market opportunities. This feature further clarifies the support that a KMS can provide potential VEs arising in the ENES. In fact, the main aim of a VE is to exploit market opportunities using the competencies of member companies. In this context, operational management is a fundamental tool that allows projects to be implemented effectively.

However, there are a number of barriers to implementing KMS in the

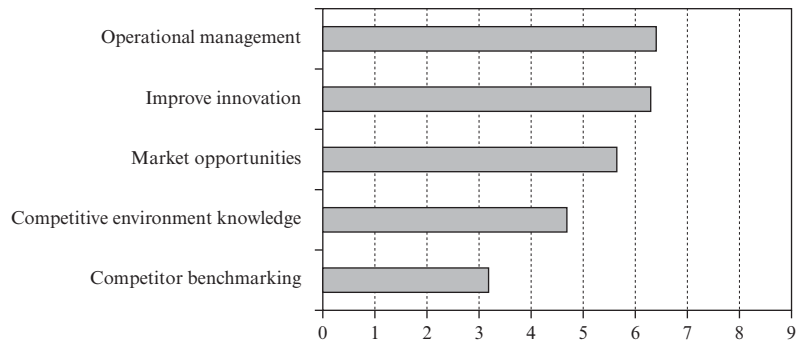

Figure 9.5 Expected benefits of the KMS of the ENES

ENES context (see Figure 9.6). Interestingly, technological barriers and the tacit nature of knowledge exchanged are the least significant barriers. This may be explained by the fact that in the SME context, work teams allow informal knowledge-sharing. Nevertheless, the lack of availability of partners to share knowledge and the need to protect critical information are the greatest barriers. This suggests that companies are oriented towards preserving their own intellectual assets from the opportunist behaviour of potential partners. Such obstacles may be overcome through increasing mutual trust. This objective may be achieved by stimulating collaboration among ENES firms.

Another aspect investigated relates to information that companies are willing to share through the adoption of a KM platform as shown in Figure 9.7. This platform may assume the structure of a complex knowledge base in which ENES firms involved in different projects may share critical information. The most important information that firms are willing to share concerns linkages with institutions and funding opportunities. This appears to be motivated by the lack of resources in SMEs that traditionally prevents such firms from managing relationships with local authorities effectively. Other important information relates to market. Firms attach significant importance on market information in order to exploit opportunities faster and more effectively in the current dynamic business context.

This is a common VE feature highlighted by the literature review (see Table 9.1). Indeed, as knowledge assumes a critical importance in new product/service development, information of this kind is critical to be shared. Another issue concerns the human resources management. In fact, as shown in the Figure 9.7, a KM platform can provide useful tools for both recruiting and training employees and new staff. Finally, ENES firms

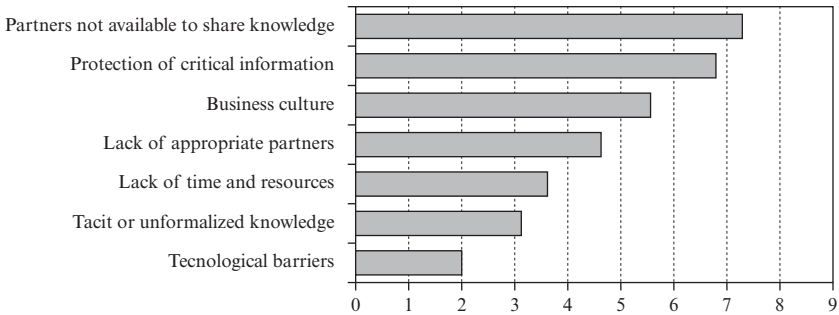

Figure 9.6 Knowledge-sharing barriers

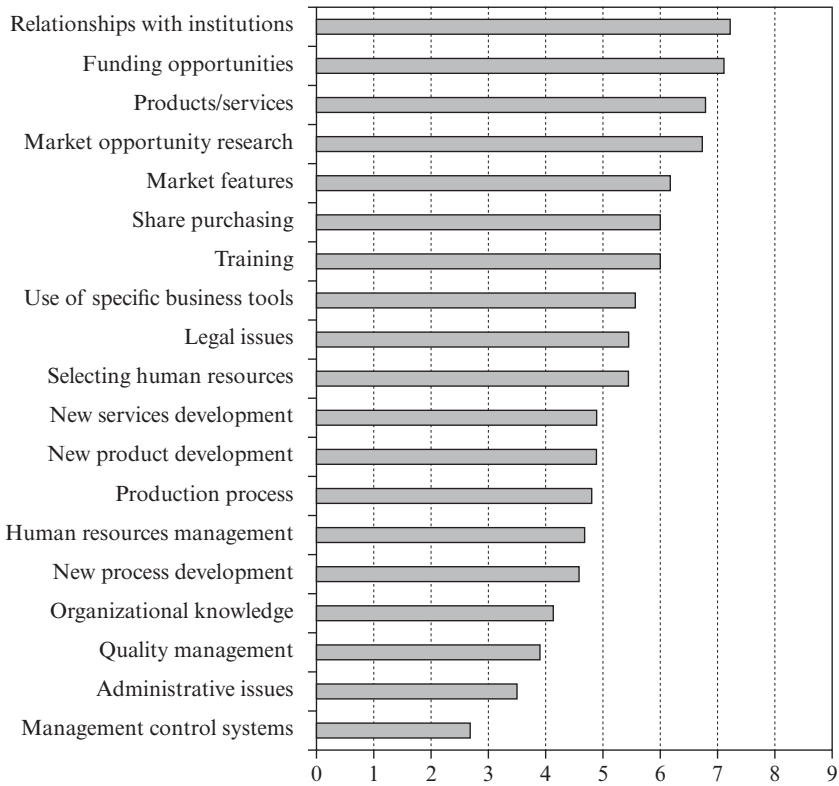

Figure 9.7 Information that firms are willing to share through a KMS platform

show a low interest in sharing information about management control systems, administrative issues and quality management. This may be explained by the fact that such information is generally firm specific.

DISCUSSION

In this section, the findings emerging from the questionnaire survey are related to the main results of the literature review. The aim is to ascertain whether the system of relationships among ENES firms is evolving towards the VE model. It is important to outline the working mechanisms of the ENES association. On the basis of a specific market opportunity, a firm proposes a project and it launches a call for adhesion. The firms that join the project create a network inside the ENES, selecting a coordinator and developing the project. Usually, the project proponent is chosen to be the coordinator. In some other cases, the role of coordinator is played by another firm participating in the project. In both cases, the coordinator is not the hierarchical leader of the project, but just the '*primus inter pares*'. In this way, ENES is characterized by a set of temporary peer relationships for specific projects. It is a dynamic network in which project collaboration relationships are continuously formed and re-formed.

The comparison is organized into two steps. In the first step, the issues shared by the current literature are compared with the issues emerging from the questionnaire survey (see Table 9.8).

Generally speaking, it appears that the empirical evidence fits most of the shared issues covered by the current literature. Nevertheless, there are some major differences which emerge in relation to the main aims in creating VE. In particular, the partnerships created within the ENES target local market opportunities. For this reason, the member companies are greatly interested in sharing information about new market opportunities. Other differences appear in relation to coordination and communication tools where the stress is on interpersonal relationships and information systems are mainly internally oriented and not fully integrated.

In the second step, issues not fully addressed by the current literature are compared with the empirical evidence obtained (see Table 9.9). Some specific features of the partnership created within the ENES are highlighted, referring particularly to the following elements:

1. In some projects, the proponent acts as coordinator.
2. In some other projects, coordination is assumed by the product integrator.
3. Most projects involve SMEs.

Table 9.8 Comparison between shared issues emerging from literature review and empirical evidence

Issues	Evidence emerging from the literature review	Evidence emerging from the questionnaire survey
Main aims	Exploit fast-changing opportunities	Pursue mainly local market opportunities Strong interest in sharing information about new market opportunities
Partnership objectives	Share costs, skills, and core competencies	Sharing costs, risks and core competencies for specific projects
Organization stability	Flexible, rapid, dynamic and reactive network	Stability of the overall ENES network Forming and re-forming of temporary organizations according to project requirements
Partnership characteristics	Temporary Collaborative and cooperative Independent companies	Temporary and dynamic according to project needs Collaborative and cooperative Independent companies
Coordination and communication tools	Extensive use of ICT and computer networks	Strong emphasis on interpersonal relationships Information systems mainly internally oriented and not integrated

4. The organizational configuration is hybrid in comparison with the other two found in Figure 9.1 due to different existing coordination mechanisms.
5. There is no KMS serving the entire ENES.
6. The need for a shared KM platform is acknowledged by the surveyed companies.
7. The companies involved in the project have a clear visibility of the target market.
8. It is the proponent and/or the product integrator that manages relationships with the customer.

Summarizing, the empirical results suggest that the ENES is a potential pool of VEs. Indeed, it is characterized by a set of dynamic networks in which collaborative relationships are continuously formed and re-formed.

Moreover, it emerges that these specific VEs created within the ENES assume a hybrid form between the two extreme VE models identified

Table 9.9 Comparison between issues not addressed by the literature review and empirical evidence

Issues	Evidence emerging from the literature review	Evidence emerging from the questionnaire survey
Coordination unit	There is no shared view about the presence of a coordinator or mechanisms of coordination (coordination unit vs self-organization)	In some cases, the project proponent acts as coordinator In other projects coordination is assumed by the product integrator
Firm size	The role of firm size in VE arrangements is not clear (large multinationals vs SMEs)	Most projects involve SMEs
Organizational structure	The VE organizational configuration is underestimated (vertical vs horizontal relationships)	Hybrid organizational configuration due to different coordination mechanisms
Knowledge management	No reference to the mechanisms of knowledge circulation in the VE configurations. There is no shared view on the presence of a knowledge management system in the VE	There is no KMS serving the entire ENES The need for a shared KM platform is acknowledged by the surveyed companies
Market relationships	The literature does not clearly identify the member company that manages customer relations	The companies involved in the project have a clear visibility of the target market The proponent and/or the product integrator manages customer relations

above (hierarchical and holarchical) (see Figure 9.8). This hybrid model has some characteristics in common with the two forms identified in Figure 9.1. In particular, the hybrid model shares the relationships among peers with the holarchical model, and the presence of a coordinating firm with the hierarchical VE model. Moreover, the ENES VE model presents some specific characteristics as the coordinating unit is not the hierarchical leader of the project, but just the *primus inter pares*.

IMPLICATIONS AND CONCLUSIONS

This chapter is based on an exploratory study analysing the possible forms that VEs may assume in the context of small firms. It provides

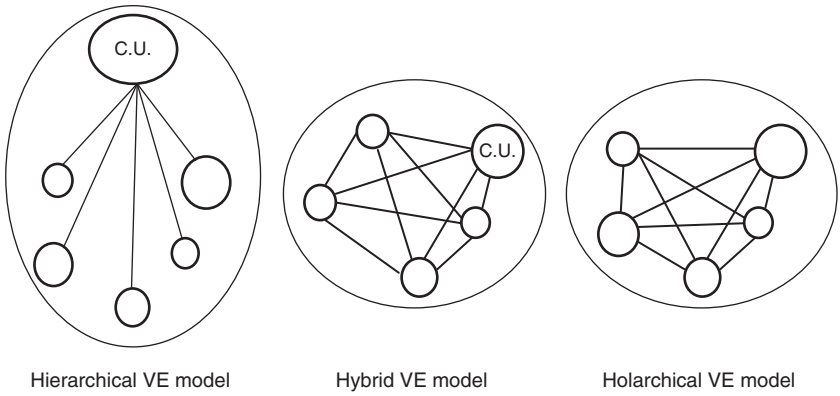

Figure 9.8 Taxonomy of VE models

empirical evidences concerning the diffusion of this new organizational model in SME networks. On the basis of a literature review, the chapter has ascertained that it is not possible to identify a unique VE model, but rather a variety of VE models may be considered within a framework. This framework includes a number of shared issues (for example, main aims of VE creation, the objectives on which the partnership is based, the stability of the virtual organization, the partnership characteristics, and the coordination and communication tools) and other specific issues (for example, coordination unit, firm size, organizational structure, KM and market relations). In particular, two extreme VE forms were identified: the hierarchical and holarchical models. In the case of the hierarchical VE model, a leader company assumes the coordination of the network and generally manages market relationships acting as the product integrator. By contrast, the holarchical model is characterized by a self-organization in which the success of the virtual enterprise strictly depends on all partners cooperating as a single unit.

As far as the empirical analysis is concerned, a questionnaire survey has been carried out on 18 SMEs belonging to the East Naples high-technology enterprise system. The ENES is characterized by a set of temporary peer relationships oriented to specific projects, in which collaborative relationships are continuously formed and re-formed. This suggests that it may be considered a potential pool of VEs. Comparison between the literature review and survey findings establishes that VEs created within the ENES assume a hybrid form between the two extremes originally identified. In comparison with the above two forms, the hybrid model has common characteristics (for example, the presence of a coordinator) and specific characteristics (for example, the coordinating unit is *primus inter pares*).

In light of the above results, some managerial and policy implications that could help the virtualization process and competitiveness of SMEs may be drawn. From the managerial point of view, in order to fully exploit the potential of virtualization, SMEs need to implement new technological solutions. For this reason, for small businesses it is necessary to support their virtualization process through the adoption of technological platforms that allow information and knowledge to be managed and shared more efficiently. In terms of policy implications, one of the basic concepts of new organizational models is collaboration among participating companies in the network. Particularly in the VE model, collaboration issues assume critical importance as competitive success may be achieved only if member companies operate as a single unit. Nevertheless, setting up collaborative relationships is known to be a somewhat difficult process. The SME virtualization process should be supported through a number of actions developed by universities and local authorities. Universities should develop technological solutions particularly geared to meeting the needs of SMEs. In this context it is crucial to involve SMEs in collaborative projects. On the other hand, the role of local authorities also appears important. Such institutions should support SME virtualization processes through a set of policy measures aimed at facilitating not only the process of innovation but also collaboration among small firms.

Finally, it is important to keep in mind that the exploratory nature of the survey limits the generalization of the results achieved. Further investigations involving a large number of firms operating in different contexts and industries are needed to validate results and models proposed in this chapter.

NOTES

1. This chapter is part of the research work carried out in two research projects funded by the Italian Ministry of University and Research. The two projects involved several Italian universities, research institutes and firms. The first project, 'Distributed Information Systems for Coordinated Service Oriented Interoperability' (DISCoRSO), is funded by the FAR programme. The second research project, 'Knowledge management in the Extended Enterprise: new organizational models in the digital age' is funded by the FIRB programme.
2. The term holarchy has been used extensively in several sciences including philosophy and astrophysics. The term holarchy in this chapter has been borrowed from the manufacturing systems optimization research where a holarchy is defined as a set of holons that cooperate to achieve a goal (Hsieh 2008). The author stated that a holon is an autonomous, cooperative and intelligent entity. Autonomy and cooperation are two important characteristics of holons. Autonomy allows holons to decide the actions needed to be taken to accomplish the objectives without consulting any supervisory entity. Cooperation makes it possible for holons to agree on common plans and mutually

execute them. In the models outlined in Figure 9.1, each small firm in the network may be considered a holon.

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10. Knowledge and organizational entrepreneurship: a relational perspective

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INTRODUCTION

The entrepreneurship literature has demonstrated the positive influence of organizational entrepreneurship on firm performance (Bhardwaj et al. 2006; Dess et al. 2003). Various studies have shown that organizational entrepreneurship has a positive relationship with firms' financial performance, a relationship that tends to become stronger over time and in dynamic, complex and competitive environments (Kuratko et al. 2001; Zahra 1991; Zahra and Covin 1995; Zahra et al. 2000).

While the importance of entrepreneurship for firm performance has been outlined, most studies have focused on the contingences of the relationship between entrepreneurial orientation and performance or corporate entrepreneurship and performance, neglecting the direct influence of other organizational and environmental factors on the level of entrepreneurship in a firm. In this respect, some studies, primarily qualitative ones, have shown that prior knowledge is a condition *sine qua non* for the identification and exploitation of new entrepreneurial opportunities (Shane 2000; Shepherd and DeTienne 2005), emphasizing that organizational knowledge is a critical factor in the entrepreneurial process.

The research on the relationship between knowledge as a resource and entrepreneurship at the firm level has centred mainly on analysing the role that the knowledge base plays in the entrepreneurial process. Yet authors like Dyer and Singh (1998) and Ahuja (2000) stress that in dynamic environments very few firms have the luxury of developing new products/services and processes solely through their internal knowledge base. Many firms turn to external sources for resources to sustain their innovation

processes. The new focus on more distributed forms of organization in both research and entrepreneurial reality, together with the ever more solid recognition of the role that alliances play in the life of firms, indicate that a relational perspective of the entrepreneurial process can complement and enrich the knowledge that we currently have on this topic.

To date, however, few insights from this perspective have diffused into conversations about the inter-organizational factors that influence the level of entrepreneurship. The current paper seeks to go beyond this atomistic perspective of entrepreneurship in its relation to the knowledge resources and fill part of the gap in current research by analysing how knowledge acquisition through a strategic alliance influences the firm's level of entrepreneurship and how this interacts with the knowledge-based resources of the firm. We focus thus on the implications that involvement in learning through inter-organizational alliances has for a firm's entrepreneurship. This insight may provide highly valuable information regarding the immediate consequences of the knowledge strategy for organizational entrepreneurship outcomes: what are the effects of the knowledge strategy (exploitation of the current knowledge or exploration of new knowledge outside the boundaries of the firm) on the level of organizational entrepreneurship? How do the two strategies condition each other?

The chapter is structured as follows: the first section presents the theoretical framework that supports the investigation; we then review the specific literature and present the hypothesis. The next sections describe the methodology employed, the analysis performed and the results obtained. We conclude by pointing out the study's contributions, its limitations and its implications for future lines of research.

THEORETICAL FRAMEWORK

Our research is grounded in the Austrian School's theory about the role of knowledge in the entrepreneurial process (Chiles et al. 2007) and the implications of a relational perspective (Dyer and Singh 1998) for organizational entrepreneurship. Several authors have recently suggested that the so-called Austrian School's theory is suitable for analysing entrepreneurship (Chiles et al. 2007; Shane 2000; Shane and Venkataraman 2000). These studies even propose a theory of strategy based on this school's prescriptions (Roberts and Eisenhardt 2003). The Austrian School's perspective refutes the premise put forth by neoclassical economic theory that knowledge is distributed uniformly in society, suggesting that individuals and organizations make decisions based on the idiosyncratic knowledge each possesses (Kirzner 1973; Lachman 1956). Studies like those by Shane

(2000) and Venkataraman (1997) have shown that a firm's particular knowledge base is crucial for recognizing entrepreneurial opportunities, as a firm will discover only the opportunities for which it possesses previous knowledge. The current developments in the Austrian perspective on entrepreneurship in relation to knowledge have focused on the role of individual subjectivism in the interpretation of entrepreneurial opportunities. The empirical developments of this perspective have neglected a very important issue recognized by the theory itself: that entrepreneurs' knowledge, their expectations and the ways of combining resources change constantly, due in part to the new information obtained through their interactions with other entrepreneurs and actors in the market (Chiles et al. 2008).

Dyer and Singh (1998) propose the term 'relational perspective' to designate a theory of resources and capacities expanded to include inter-organizational relationships, indicating that firms' critical resources can cross organizational boundaries and become embedded in inter-organizational routines. Strategic alliances or long-term relationships with clients and providers are important ways of accessing information, resources, markets and technologies (Gulati et al. 2000). The relational perspective of the firm and the literature on networks have shown the importance of social and inter-organizational relationships to attract the resources needed in the process of seeking and exploiting opportunities (Hoang and Antoncic 2003; Singh et al. 1999) and in entrepreneurial growth (Larson 1992; Lechner and Dowling 2003).

However, in spite of the research results on the role of social networks and organizations in the entrepreneurship process, the myth that entrepreneurship is a purely individualistic practice continues to dominate the specialized literature (Dodd and Anderson 2007). At the organizational level, a relational perspective of entrepreneurship demands recognition that any entrepreneurial firm depends on many actors to achieve its goals (Jones et al. 2001), while simultaneously influencing these actors and the relationships between them through its own actions. Studying the relationship between organizational knowledge and entrepreneurship while ignoring knowledge acquisition through relationships with other firms means bypassing a very important aspect of the entrepreneurial reality, as the new knowledge plays an important role in renewing the firm's foundations and creating the framework for opportunity discovery and exploitation.

To summarize, first our theoretical framework builds on the Austrian premise that prior knowledge is necessary in the entrepreneurial process. Secondly, based on the relational view of the firm and on knowledge management literature, this prior knowledge is not knowledge developed exclusively in the firm, as it is found formally and informally in different kinds

of exchange relationships with other firms in the environment through which knowledge flows. Finally, putting together the two frameworks we propose a relational view of the relationship between knowledge and organizational entrepreneurship.

Organizational Entrepreneurship and Knowledge Acquisition

Numerous studies have underlined the positive effect of organizational entrepreneurship on firm performance, survival and growth (Bhardwaj et al. 2006; Dess et al. 2003). Organizational entrepreneurship, defined as entrepreneurship at firm level (Sharma and Chrisman 1999), deals with the firm's activities oriented to the discovery and exploitation of business opportunities (Shane and Venkataraman 2000).

The organization's level of entrepreneurship has been tackled in two main ways in prior studies: through the construct of entrepreneurial orientation, developed initially by Miller and Friesen (1983) and subsequently revised by Covin and Slevin (1991), Zahra and Covin (1995), Lumpkin and Dess (1996), Knight (1997), and so on; and through the construct of corporate entrepreneurship developed by Guth and Ginsberg (1990) and Zahra (1991, 1993). If entrepreneurial orientation is characterized by three main dimensions – innovativeness, risk-taking and proactivity, which research has most recently shown to have both a joint and an individual positive effect on performance – then corporate entrepreneurship is defined through strategic renewal and the undertaking of new business for the firm, both internally and externally. In subsequent studies like those by Sharma and Chrisman (1999) and Antoncic and Hisrich (2001, 2003) both concepts have been integrated into that of intrapreneurship, which unites all of the dimensions cited. Although different terms designate the same concept and different concepts designate the same activities, the majority of the studies agree that the three main dimensions subjacent to the concept of entrepreneurship at the organizational level that can be encountered in almost all of the research done up to now are innovativeness, risk-taking and proactivity.

Innovativeness is characterized by a tendency to support new ideas, to experiment and use creative processes. Proactivity refers to a posture that anticipates the desires and future needs of the market, capitalizing on emerging business opportunities. This involves taking risks associated with bold acts that involve committing resources without any certainty of gain. Therefore, organizations that show an orientation towards innovation and proactivity are more likely to discover and exploit new entrepreneurial opportunities.

On the other hand, the acquisition of external resources has become an

issue of striking importance for the performance of firms, particularly in technological sectors, as these resources enable them to face the exigencies of an environment characterized by continuous change and complexity. Among the kinds of resources that new technology firms acquire externally, one kind has received special emphasis in the scientific community, as it represents the basis of most of the firms' exchanges: knowledge.

A significant part of the specific literature on organizational knowledge has analysed how knowledge, especially newly acquired knowledge, leads to the creation of new goals for the organization (Hargadon and Fanelli 2002). Nevertheless, acquisition of knowledge through strategic alliances, while often a topic of study in the literature on knowledge management has not been analysed specifically at the level of organizational entrepreneurship. The concept of knowledge acquisition, sometimes called knowledge sharing or knowledge transfer, refers to the processes through which organizational actors exchange, receive and are influenced by the knowledge of their peers (van Wijk et al. 2008), thereby enriching, updating, and changing their knowledge base.

Liao et al. (2003) find that external knowledge acquisition is positively related to small business responsiveness capacity. The results of the study of 242 small businesses confirm that external knowledge acquisition improves the responsiveness of the firm to environmental changes and this relationship is stronger in companies with a more proactive strategy. Knowledge acquisition was also found to be positively related to the innovative performance of the firm. According to Brockman and Morgan (2003), externally acquired information influences the profits that new products yield during their first year of life on the market. Knowledge acquisition from key customer relationships is positively associated with the number of new products developed, technological distinctiveness and a reduction in the sales costs of the firm (Yli-Renko et al. 2001). The heterogeneity of acquired knowledge influences the general entrepreneurial performance positively and influences the organization's innovation more significantly (Rodan and Galunic 2004).The acquisition of knowledge through an inter-organizational alliance will also deepen and extend the firm's knowledge base, differentiating it from that of competitors in terms of new products launched and the technologies and processes used (Yli-Renko et al. 2001; Zahra et al. 2000).

The growing importance of knowledge management has also been put forward in the context of risk management and especially in the financial services industry. Based on various case studies, Marshall et al. (1996) state that understanding what knowledge firms possess and seeking out the knowledge needed is a key factor in managing risk. Thus, knowledge acquisition proves to be an important alternative resource

in managing the risk entailed in proactive activities of discovering and exploiting opportunities.

As knowledge acquisition is positively related to all the dimensions that characterize organizational entrepreneurship (that is, proactivity, innovativeness and risk-taking), we propose the following hypothesis:

Hypothesis 1: The acquisition of knowledge through an inter-firm alliance positively influences the firm's level of organizational entrepreneurship.

Knowledge-based Resources of the Firm and Organizational Entrepreneurship

From a strategic perspective of resources and capacities, previous studies have shown that organizational knowledge is a key resource that can lead to the creation of competitive advantages (Grant 1996; Teece et al. 1997). Because organizational knowledge is a resource that is rare, valuable, difficult to imitate and specific to the organization (Zander and Kogut 1995), it is a central element for obtaining superior entrepreneurial performance. At the same time, entrepreneurship literature has answered the key question 'Why do people discover some entrepreneurial opportunities and not others?' both theoretically and empirically indicating that people recognize opportunities related to the knowledge that they already possess (Shane 2000; Venkataraman 1997). People possess different knowledge due to the different mix of life experiences of each and the non-uniform distribution of information in society (Hayek 1945).

According to Venkataraman (1997) each person's idiosyncratic prior knowledge creates a 'cognitive path' that permits the person to recognize certain opportunities and not others. As a result, although information on technological change is available to many people, only part of the population will possess the prior knowledge that enables discovery of an entrepreneurial opportunity. Expanding these premises to the organizational level, Shane's (2000) study of the invention of the three-dimensional (3D) printer at the Massachusetts Institute of Technology (MIT), and the opportunities that its application generated in eight firms, shows that a firm will only discover opportunities related to its prior knowledge. Shepherd and DeTienne (2005) demonstrate that the greater the prior knowledge of the client's problems, the greater the number of opportunities discovered by the firm and the more innovative they are. At the same time, a greater entrepreneurial orientation of the organization strengthens the positive impact that knowledge-based resources of the firm have on entrepreneurial performance (Wiklund and Shepherd 2003).

The firm's knowledge base has been related to performance (DeCarolis and Deeds 1999; Moorman and Miner 1997), as well as to the firm's level of innovation. Several studies reveal a positive relationship between knowledge and the firm's innovative activity (Tsai 2001) and find that knowledge strengthens the relationship between innovation and growth in income (Thornhill 2006). The employees' education level and their functional heterogeneity as measures of organizational knowledge heterogeneity are related to the rate of introduction of new products (Smith et al. 2005). A rich knowledge base and its adequate management are also considered the key to dealing with the risk inherent in proactive activities (Marshall et al. 1996). More than this, as Wang (2008) puts forward, firms with a high entrepreneurial orientation are more inclined to develop their knowledge base which in turn translates into superior organizational performance.

Based on the findings in entrepreneurship theory on the determinate role of previous knowledge in discovering and exploiting new opportunities, and on the findings in knowledge management on the role of organizational knowledge in the innovation performance presented above, we formulate the following hypothesis:

Hypothesis 2: The knowledge-based resources of the firm positively influence the firm's level of organizational entrepreneurship.

Knowledge Acquisition, Knowledge-based Resources and Organizational Entrepreneurship

The variables of knowledge acquisition and knowledge-based resources both have implications for the firm's knowledge strategy, defined as the set of strategic choices that a firm makes with respect to knowledge (March 1991). Knowledge strategy has been treated in two main ways in the literature: the creation or acquisition of new knowledge (exploration) and the ability to employ existing knowledge to create new products and processes (exploitation) (Bierly and Daly 2007). Some studies have analysed these forms as strategic alternatives, arguing the pros and cons of using one or the other, while other studies have shown the complementarities between the two.

With respect to firms' entrepreneurial behaviour, the relationship between exploration with the goal of acquiring or creating new knowledge and the exploitation of prior knowledge is found to be of particular importance. Entrepreneurship at the organizational level involves infusing innovation, proactivity, and risk taking in firms' operations (Knight, 1997), which require both exploring new knowledge and exploiting knowledge currently possessed. Specifically, Simsek et al. (2003) indicate

that applying the logic exploration/exploitation to the organizational level of entrepreneurship may offer valuable insights as to its dynamics. Entrepreneurial activities at the organizational level can build on the existing resources and capacities of the firm (exploitation), or they may need the development of new resources and capacities in order to come into existence (exploration). The specific literature on this topic has generally conceptualized these strategies as competing for the limited resources of the firm. They have been conceived as the limits of a continuum (Lavie and Rosenkopf 2006; March 1991). Exploiting continually and incrementally the knowledge possessed at a given moment has positive repercussions for the firm's short-term gains, but it is not realistic to expect that this will lead to a sustainable competitive advantage. Further, firms may become experts in areas that are no longer of interest to their customers. Using a strategy of exploration involves high costs and risks for the firm, as it slows the development of the firm's actual competences. At the same time it can become a long-term competitive advantage (March 1991).

At the same time, other authors have emphasized the synergies associated with exploiting and exploring knowledge simultaneously. For example, in a sample of manufacturing firms in the USA Bierly and Daly (2007) found that the exploitation and exploration of knowledge are two different but complementary constructs and that their relationships to organizational performance take different forms. The relationship between exploration and performance is linear and positive, whereas the relationship between exploitation and performance is concave, indicating that there is a point after which focusing efforts on exploitation leads to decreasing profits. Tsai and Wang (2008) argue that acquisition of technologies through alliances improves the organizational performance to the extent that the internal research and development (R&D) efforts increase. In a study of firms in the Belgian manufacturing industry, Cassiman and Veugelers (2006) also find that the research and development of knowledge in the firm and the acquisition of external knowledge are complementary innovation activities.

However, for small firms it is difficult to simultaneously pursue exploration and exploitation activities. It has been emphasized that in order to do both, organizations need to possess large amounts of resources and specific organizational arrangements such as temporarily cycling through different structures for exploration and exploitation, creating differentiated units or enabling employees to move back and forth between different structures (Raisch 2008). Small firms usually possess scarce bases of knowledge but their size is unlikely to allow for these specific organizational arrangements. As with any exploratory activity, knowledge acquisition requires resource assignments, so when we study its impact on the relationship

between the knowledge-based resources of the firm and organizational entrepreneurship we should expect its moderating effect to be negative. As presented below, the result of previous studies as that of De Clercq and Dimov (2008) support our argument. They find that in the context of venture capital investing, external knowledge acquisition through inter-organizational relationships is specifically beneficial when the knowledge base of the firm is scarce with respect to the particular investment; in other words, to the entrepreneurial company funding. This suggests that the moderating effect of knowledge acquisition on the relationship between knowledge-based resources and organizational entrepreneurship might be negative. So, we formulate the third hypothesis as follows:

Hypothesis 3: The relationship between a firm's knowledge-based resources and the organizational level of entrepreneurship is negatively moderated by the acquisition of knowledge from a strategic alliance.

METHODOLOGY

Our study was based on a sample of small and medium-sized Spanish firms in the new technologies sector. The data was collected between January and March 2008 through structured telephone interviews addressed to general managers. To obtain the 215 responses, we approached 896 randomly chosen firms whose contact data were obtained through the SABI database. This gave us a response rate of 23.99 per cent. Of the 215 responses obtained, three surveys were eliminated because they were incomplete and nine because the organizations did not actually fit the profile of the small or medium-sized enterprise according to which they had been chosen from the SABI database.

The data collected show that most of the firms are consolidated, as 74.9 per cent of them have been in existence for more than five years. Only 11.8 per cent fall in the category of newly created firms, with less than three years in the market, and only 13.3 per cent are between three and five years old. Micro-firms, with fewer than ten employees, comprise 9.1 per cent of the firms surveyed. Fifty per cent employ between ten and 50 workers, and 40.9 per cent report having between 50 and 250 employees.

As the analysis that we performed refers to the perception of knowledge acquisition through an entrepreneurial alliance, we considered it crucial to extract basic data about these relationships, such as their length and whether or not they were formalized with an agreement. The results show that 80.7 per cent of the firms surveyed have a formal agreement with their

strategic ally. The relationships with these firms are usually medium to long term: 73 per cent of the organizations state that they have maintained a relationship with their ally for more than three years.

The collection and use of retrospective data can create many potential problems, given the bias in the perception of past facts and situations and the possible lack of familiarity with all of the issues analysed. To correct for these possible biases, the interviews were carried out with managers, since they are the people with the most holistic knowledge of the business's situation. The questions asked targeted a limited number of issues in the area of their competences as managers over the last three years, so that their memories would be precise and relevant. At the same time, we made clear to them that there were no right or wrong answers and that the data was confidential and would only be used in aggregate form.

Of the scales used to measure entrepreneurship at the organizational level, Knight's (1997) has been validated in an intercultural context in two languages, French and English, while Antoncic and Hisrich's (2001) has been validated in Slovenian and English. In the current study, we followed the scale developed by Knight (1997), because it has been used more widely and has received confirmation in specific studies of organizational entrepreneurship and also because of the proximity of French as a language in which it has been validated. The instrument developed by Knight (1997) is composed of eight items evaluated on a scale from 1 to 7, where 1 signifies total disagreement and 7 total agreement. The Cronbach's Alpha calculated for this variable is 0.861.

We also used a scale from one to seven to measure the acquisition of new knowledge according to a measurement adapted from Yli-Renko et al. (2001). We asked the interviewees to identify an alliance that they considered very important for the subsequent development of their organization and to evaluate acquisition of knowledge through this relationship. Yli-Renko et al. (2001) measure knowledge acquisition through four items that refer to technological knowledge and knowledge of the market that can be acquired through the relationship with the main customer. Given that these are new technology firms and inter-organizational relationships like those in the initial study, we considered that the measurement of acquisition of technological knowledge and knowledge of the market is appropriate for our research. The Cronbach's Alpha was calculated to be 0.845. The firm's prior knowledge has been measured in the same way by Wiklund and Shepherd (2003), following the instrument initially created by Gupta and Govindarajan (2000). The scale measures the firm's position with respect to its competitors in terms of organizational knowledge. The items also refer to technological knowledge and knowledge of the market. For the latter variable, the Cronbach's Alpha is 0.919.

Analysing the impact of knowledge acquisition through a strategic alliance on organizational entrepreneurship requires controlling for the characteristics of the receptor firm, the relationship and the environment. As control variables, we introduced the age of the firm, its size (measured by number of employees), and the length of time the alliance has existed, the existence of a formal agreement and the dynamism of the environment. Various prior studies have shown that the environment affects the relationship between entrepreneurial orientation and entrepreneurial performance (Lumpkin and Dess 1996). The dynamism of the environment, which is a defining characteristic for the new technology sector, completes the set of control variables mentioned. Dynamism of environment was measured by adopting the three-item scale used by Zahra (1991), evaluating from 1 to 7 the degree of agreement with statements related to the frequency of changes in production methods, marketing practices and products perceived in the environment.

ANALYSIS AND RESULTS

The relationships proposed were studied through a linear hierarchical regression analysis, taking organizational entrepreneurship as the dependent variable. Table 10.1 shows the correlations, the means and the standard deviations in the variables used in the study.

The results of the different regressions are shown in Table 10.2. To discount any effect derived from multicollinearity, we performed a contrast that indicated that the variance of inflation factors (VIF) of the variables was not greater than 2. We thus discounted the effects on the results of the first three models. On introducing the moderating effect, we observed that the VIF corresponding to the variables prior knowledge, knowledge acquisition and the product of the two are higher than 2. To eliminate this effect derived from multicollinearity, we centred the means for prior knowledge and knowledge acquisition, according to the recommendation of Jaccard and Turrisi (2003). On repeating the test for multicollinearity, we found that the VIF of the variables did not exceed 2. We can therefore discount the effects of multicollinearity on the results.

The base model, model I, only considers the effect of the control variables that explain 20 per cent of the variance in organizational entrepreneurship to be statistically significant ($R^2 = 0.20$). The firm's age has a significant and negative effect on organizational entrepreneurship. The younger the firm, the greater its level of entrepreneurship and as firms age, their level of entrepreneurship decreases. The effect of firm size on organizational entrepreneurship is positive and statistically significant. Neither

Table 10.1 Correlations, means and standard deviations

	Mean	SD	1	2	3	4	5	6	7
1. Entrepreneurship	4.69	1.16	–						
2. Knowledge acquisition	4.74	1.35	0.257**	–					
3. Prior knowledge	5.32	1.02	0.610**	0.264**	–				
4. Firm age	14.58	13.55	−0.187**	−0.094	−0.132	–			
5. Firm size	60.26	58.79	0.214**	0.028	0.044	0.040	–		
6. Duration of the relationship	8.00	7.74	−0.102	0.094	−0.140	0.271**	0.044	–	
7. Formal agreement	0.81	0.39	0.147*	0.224**	0.082	−0.119	0.139	0.025	–
8. Dynamism	3.79	1.60	0.370**	0.188**	0.227**	−0.109	0.071	−0.203**	0.041

Note: * $p < 0.05$; ** $p < 0.01$.

Table 10.2 Results of the regression for organizational entrepreneurship

	Model I		Model II		Model III		Model IV	
	B stand.	t	B stand.	t	B stand.	t	B stand.	t
Control variables								
Firm age	−0.156*	−2.234	−0.140*	−2.036	−0.093	−1.649	−0.090	−1.607
Firm size	0.170*	2.529	0.178**	2.676	0.188**	3.448	0.167**	3.046
Length of the relationship	−0.004	−0.050	−0.027	−0.389	0.022	0.377	0.006	0.100
Formal agreement	0.102	1.510	0.063	0.924	0.056	1.003	0.059	1.078
Dynamism	0.323***	4.753	0.287***	4.178	0.191**	3.332	0.191**	3.386
Independent variables								
KA Knowledge acquisition			0.172*	2.478	0.046	0.781	0.050	0.851
PK Prior knowledge					0.560***	9.729	0.573***	10.025
KA x PK							−0.125*	−2.289
Model								
Adjusted R^2		0.20***		0.226***		0.510***		0.525***
Change in adjusted R^2				0.026		0.284		0.015

Note: * $p<0.05$; ** $p<0.01$; *** $p<0.001$.

the length of the relationship nor the existence of a formal agreement has a significant influence on the level of entrepreneurship in the base model or in any of the following models proposed. The opposite occurs with dynamism of the environment, whose positive and statistically significant effect is maintained in all of the following models.

In model II we incorporate the effect of knowledge acquisition, causing the variance explained by the model to increase to 0.226 (adjusted R^2). The corresponding regression coefficient is positive and statistically significant. Therefore, the effect of knowledge acquisition is positive and statistically significant, which leads us to accept the first study hypothesis.

In model III we also consider the variable of prior knowledge. This addition improves the coefficient R^2 by 0.284, indicating a better explanation of the model's total variance, which increases to 51 per cent. The corresponding beta coefficient is positive and statistically significant. This confirms the second study hypothesis. On introducing this variable, the effect of knowledge acquisition continues to be positive but not statistically significant.

Finally, model IV incorporates the moderating effect of knowledge acquisition. The results show that the beta coefficient corresponding to the new independent variable considered is statistically significant and negative. This confirms the third study hypothesis, and we deduce that the moderating influence of knowledge acquisition on the relationship between knowledge-based resources and organizational entrepreneurship is negative.

The results obtained show that prior knowledge and acquisition of knowledge through strategic alliances have a positive influence on organizational entrepreneurship and, together with the control variables, explain 50.1 per cent of its variance. Thus the greater the prior knowledge base, the more entrepreneurial the firm. This supports prior results such as those of Shane (2000) who finds that firms will discover only those opportunities about which they possess prior knowledge; and those of Shepherd and DeTienne (2005), who show that the greater the prior knowledge of the customer's problems, the more opportunities are discovered and the more innovative they are. The greater the knowledge acquisition through strategic alliances, the more entrepreneurial the firm is. Inter-organizational alliances offer idiosyncratic resources such as new knowledge that enable the firm to sustain its innovative and proactive behaviour in order to discover new opportunities and exploit them. In considering the interaction between prior knowledge and the acquisition of new knowledge, however, we conclude that there is a negative moderating effect of knowledge acquisition on the relationship between firms' knowledge-based resources and organizational entrepreneurship.

The results indicate that for firms with a greater base of prior knowledge, using a deliberately exploratory strategy for knowledge acquisition through strategic alliances may have negative repercussions on the firm's level of entrepreneurship in the short term. The smaller the base of prior knowledge, the more advisable an exploratory strategy of alliances that permits attracting the resources needed in the entrepreneurial process.

DISCUSSION AND CONCLUSIONS

Entrepreneurship has been cited as a crucial factor for improving the firms' performance, supporting its growth and creating wealth or competitive advantages (Zahra 1996). However the internal and external characteristics of the firm that influence the level of organizational entrepreneurship represent an area of research that has not been explored in depth, since previous studies have focused mainly on contingencies of the entrepreneurship–performance relationship.

The current study, together with that of Antoncic and Prodan (2008), open the way to a deeper exploration of the organizational and interorganizational determinants of the level of entrepreneurship in a firm. At the same time, they indicate that strategic alliances are an important source of resources for organizations' entrepreneurial activities. The results obtained identify two facets of the role of knowledge acquisition: stimulating entrepreneurship and moderating the relationship between exploitation of the current knowledge and entrepreneurship.

Our chapter contributes to the literature in three substantial ways. First, it shows that both prior knowledge and the acquisition of new knowledge through an alliance influence organizational entrepreneurship positively. Wiklund and Shepherd (2003) argue that the entrepreneurial orientation of a firm strengthens the positive impact of organizational knowledge on performance. Our chapter complements this finding by emphasizing that organizational knowledge in turn offers a base for organizational entrepreneurship activities. Prior studies of knowledge-based resources and entrepreneurship at the organizational level have emphasized the prior knowledge that firms possess, ignoring the important potential source of entrepreneurial opportunities in knowledge acquired through interorganizational relationships. Empirical exploration of the relationships proposed enriches the existing literature on entrepreneurship, advancing knowledge of the origin of entrepreneurial opportunities in the interorganizational context of firms.

Second, this study shows a negative moderating effect of knowledge acquisition on the relationship between the firm's knowledge base and

organizational entrepreneurship. A strategy focused on exploration through knowledge acquisition from strategic alliances may derive knowledge resources initially designated to entrepreneurial activities to support the assimilation and integration of the new knowledge acquired. In the short term, before the new knowledge is aligned with the general strategy of the firm and integrated in its knowledge base, knowledge acquisition has negative repercussions on the relationship between an organization's previous knowledge base and organizational entrepreneurship. This result has important implications for entrepreneurial practice, especially for new firms and small and medium-size enterprises, whose knowledge bases and resources are generally considered to be scarcer. In this situation, using a strategy of exploration and acquisition of new knowledge through organizational alliances has positive implications for organizational entrepreneurship and thus for performance and growth of the new firm, but in the short term it weakens the positive influence that the resources of the firm have on the level of entrepreneurship. Future longitudinal studies are needed to explore the same relations in a wider timeframe.

Finally, the chapter highlights a view of entrepreneurship integrated in the socio-economic context of the firm, specifically in terms of relationships with peers. It thus opens a new line of research about knowledge transfer between firms and its relation to entrepreneurship. Over ten years ago Uzzi (1997) indicated that involvement in inter-organizational and interpersonal relationships creates economic opportunities that are difficult to replicate through markets, contracts and vertical integration. In this context, the literature on knowledge management and entrepreneurial networks offers a coherent theoretical foundation and a starting point for future studies of issues related both to the process itself, as well as to firms' characteristics, relationship characteristics and knowledge characteristics and their influence on organizational entrepreneurship. Specifically we wish to indicate a line of research that has received little attention in the literature on knowledge transfer and whose implications for the study of organizational entrepreneurship can be fundamental to analysing the discovery and exploitation of opportunities in the inter-organizational context. This is the joint action of the characteristics of the relationships and knowledge on organizational entrepreneurship.

The main limitation of this study lies in the use of perceptual measurements. Despite the limitations regarding the richness of information and the specificity of each firm's case inherent in a quantitative study, we believe that it is important to define general orientations and perceptions in organizations concerning their development, the resources they manage and the ways available for enriching these resources.

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11. The impact of legitimacy building signals on access to resources

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INTRODUCTION

There is broad consensus in the literature that entrepreneurship is an economic and socially embedded phenomenon (Welter and Smallbone 2008; Steyaert and Katz 2004; Davidsson 2003). Tornikosky (2009) explains that due to the fact that nascent and new firms need to acquire resources they are generally very dependent on external parties, emphasizing the importance of the resource dependence perspective. According to this theory, firms may seek legitimacy through active control in shaping the institutional environment. Previous research has also suggested the use of institutional and social network theory to examine whether or not institutional norms and/or network configurations influence individuals' ability to acquire resources or grow their ventures (Greene et al. 2003). Specifically, institutionalized social structures at the micro (household), meso and macro levels can have unique implications on women's entrepreneurship (de Bruin et al. 2007).

Drawing upon these theories, the aim of this study is to find out if business-owners can procure more resources that are needed to be successful and potentially grow by sending signals of legitimacy to their environment through their personal characteristics and social capital. Questions that this study aims to answer include: which are the sources of legitimacy for new ventures? Which are the entrepreneurial networks that are effective at facilitating access to complementary resources? Does their gender assist/constrain women in dealing with the external business environment?

Following a review of the literature, these issues are examined based on data from a survey of new Spanish ventures. Finally, the implications of the results are discussed and avenues for future research are suggested.

RESEARCH FRAMEWORK

The venture creation process is closely linked to acquiring resources, the availability of which will depend on the legitimacy shown by firms to their environment, that is, to those institutions and individuals with which they have to engage in exchanges. Legitimacy is the social judgement of the acceptance, appropriateness and desirability of the firm (Di Maggio and Powell 1991). According to institutional theory (Deephouse 1996; DiMaggio and Powell 1983), in order for entrepreneurs to be credible, they must 'play' by the pre-established rules of business and shape their organization in such a way as to mimic existing organizational forms and practices. One way to play by the rules is by sending signals to outsiders in order to increase legitimacy. In this sense, signalling theory proposes the importance of information signals about viability, competence and potential value of a venture as they are perceived by outsiders in entrepreneurial uncertain contexts (Busenitz et al. 2005; Zimmerman and Zeitz 2002; Deeds et al. 1997).

Although entrepreneurs are not able to communicate all relevant knowledge about their ventures to outsiders (Alvarez and Busenitz 2001), if there are positive information signals, observers can arrive at favourable perceptions which can be linked to venture funding and outcomes. Being perceived as a legitimate business person with credibility can serve as a resource for promoting a venture's viability, especially during early and growth stages (Suchman 1995). If signalled information about a venture is unfavourable, it can increase equity costs, dissuade customers or hinder the search for funding (Busenitz et al. 2005). Information signals indicating credibility and legitimacy are instrumental in procuring resources. They can relate to relevant industry experience, relationships with key industry players, access to information, possession of expert knowledge (Busenitz et al., 2005), founding teams' industry status, entrepreneurially relevant demographic features and social capital (Packalen 2007). These factors can be interpreted as 'indicators of legitimacy building signals'.

However, legitimacy is a perception held by an organization's external audience and, as a consequence, it is an unobservable construct which is very difficult to measure in a rigorous manner and, therefore, is often inferred indirectly through the actions of external audiences (Zimmerman and Zeit 2002; Tornikosky and Newbert 2007; Tornikosky 2009). Legitimacy improves chances of acquiring all of the various resources needed to survive and grow, such as capital, technology, managers, competent employees, customers and networks (Aldrich and Fiol 1994). For this reason, and since it is important to be perceived as 'legitimate' for gaining resources which are crucial for new venture growth, in this study

it is proposed that the endowment of resources deployed by business-owners act as a legitimacy signal that will influence the availability of external resources. Therefore, it is assumed that legitimacy is the central notion behind the acquisition of resources, although we do not measure legitimacy or whether legitimacy is acquired, echoing Tornikosky's (2009) study about firm emergence.

Human and Social Capital

The relationship between human capital and personal reputation is well documented (Morrison and Wilhelm 2004; Preston 2004). The legitimacy conferred by resource gatekeepers will be, at least in part, a function of the credibility of the lead entrepreneur's personal characteristics (Tornikoski and Newbert 2007). It is particularly important that that he or she has the skills and abilities to accomplish the organizing tasks (Low and Sritvasan 1994); for example with respect to experience in the industry (Boeker and Karichalil 2002; Hall and Hofer 1993) or starting up a new venture (Colombo and Grilli 2005; Shepherd et al. 2000).

Hypothesis 1: Business owners with more human capital (level of education, experience, time devoted to the firm) have more favourable access to critical resources.

Social connections are widely recognized as an important means through which organizations can acquire legitimacy (Aldrich and Fiol 1994). That is, networking plays a role in mobilizing complementary resources, getting support and help, and establishing viable business relations (Greve 1995) and, therefore, it is important for venture viability (Berry et al. 2006; Liao and Welsch 2005). From a reputation perspective, the effectiveness and efficiency of networking is influenced by 'who' the networkers are, 'what' the networks are and 'how' the networking activities take place (Shaw et al. 2008). In this line, Nahapiet and Goshal (1998) identify three dimensions of social capital: structural, cognitive and relational. Once access is established, like-mindedness (cognitive social capital) and trust (relational social capital) should ideally be developed in key interpersonal ties across the actors in their relationships (Prasthantham 2008). With respect to social capital dimensions, the structural one, which may be defined as the location of the entrepreneur in a network of contacts, is critical to perceptions of legitimacy (Carson et al. 2004; Nahapiet and Ghoshal 1998; Shaw 2006; Silverside 2001; Stokes 2002) sending signals of credibility and potential value (Busenitz et al. 2005). The entrepreneur through his or her contacts with customers, consultants or financial providers can access

valuable information or funding those without these social ties cannot (Witt 2004).

With respect to the cognitive dimension of social capital, sharing information is emphasized as an important aspect for building relationships with stakeholders and developing reputation (Carter et al. 2002; MacMillan et al. 2005). This dimension enhances the effectiveness of knowledge transfer through the development of shared meanings among actors (Inkpen and Tsang 2005). Finally, the relational dimension consists of the development of trust between the actors, so that they have confidence that they will not be opportunistically exploited, thereby facilitating information exchange. Aldrich (2000, p. 217) indicates that successful new entrepreneurs are more likely to build networks of trust, which assists them in creating legitimacy within the market. Trust is the 'lubricant' without which network activities would not be possible (Anderson and Jack 2002). The lack of legitimacy reflects a lack of trust in so far as new firms are not known and, therefore, non-'trusted' by their potential customers and suppliers (Welter and Smallbone 2006). Therefore, it is proposed that:

Hypothesis 2: Business owners with specific social capital (structural, cognitive and relational dimensions) have more favourable access to critical resources.

Gender

Legitimacy signalled to outside observers is tied to contextual aspects together with the overall set of values shared by members in a social system (Murphy et al. 2007; Eagly 2005). Bourdieu (1977) argued that the social world is comprised of both *objective* and *subjective* structures created by the subconscious systems of classification which individuals use as symbolic templates. Structures created by human interactions reflect tacitly taken-for-granted assumptions which underpin society's 'natural' attitude toward gender differences, conferring a lower symbolic capital to women. For example, most Western cultures still portray the entrepreneurial role as being more masculine than feminine (Achtenhagen and Welter 2003).

In this line, de Bruin et al. (2007) state that social, cultural, and institutional arrangements frame not only how many women perceive opportunities and make strategic choices, but also how these women and others view their businesses. Particularly relevant is how the 'gatekeepers' of resources have an impact, often subtle or hidden, on the entrepreneurial activity of women. Most studies show that female entrepreneurs are confronted with specific barriers that include access to credit and financial capital, technology and intellectual property, new customers and critical

market or business information, which can be linked to perceptions of legitimacy (Finnegan 2000; Greve and Salaff 2003), or to problems being '*taken seriously as a business person*' (Shaw et al. 2008; original emphasis). Therefore, female entrepreneurs are generally highly conscious of threats to legitimacy (Kourilsky and Walstad 1998) and they are more responsive than men to the level of normative support or society's general positive regard to their entrepreneurial activity (Baughn et al. 2006).

In this study, women owning firms within knowledge intensive industries are expected, similar to their male counterparts, to have high levels of human capital, in terms of both education and skills over the course of time (Bates 1995). However, it has been found that they have fewer years in independent practice (Collins-Dodd et al. 2004; Marlow and Carter 2004). This lack of experiential capital may be compounded by a tendency on the part of women to create their firms at a younger age. Therefore, the profile of older male business-owners enables men to accrue more experience and credibility (Cowling and Taylor 2001; Shaw et al. 2005).

Evidence regarding differences in the nature of the network and networking activity between male and female entrepreneurs is limited (Conway and Jones 2006). However, there is consensus in that qualitative gender differences can be identified in the nature of the process by which assistance is received, as well as in the networking contacts they use (Welter et al. 2007). There seems to be agreement in the fact that although kinship contacts are instrumental in all the stages of development of the firm, the larger reliance on them on the part of women may be detrimental (Greve and Salaff 2003). This is because it may imply they have spent less time interacting with stakeholders – especially customers – (Shaw et al. 2008) which is very important for building reputation (Baron and Markman 2003; Jack 2005). Some research points out that they face difficulties in accessing networks which enable access to critical resources and that they have less central positions within the networks. However, it has also been observed that they may seek to compensate and legitimize their position as business owners by actively engaging in networking (Shaw et al. 2008).

These studies concentrate on the structural dimension of social capital from a gender perspective and, therefore there has been a dearth of research with respect to the cognitive and relational dimensions of social capital in relation to gender. However, we propose that these dimensions could help to clarify why women feel they are not taking advantage of networks in terms of business growth (Manolova 2006), or why some studies do not find a relationship between female social capital and entrepreneurial success (Shaw et al. 2008). In relation to the cognitive dimension, female owners' discussion of personal rather than business matters within the network may contribute little to either their personal reputation or that of

their firms, since they might be perceived as less business focused, which in turn might affect stakeholder perceptions of them (Shaw et al. 2008). Focusing on the relational dimension, several studies have highlighted that women prefer 'strong ties' in their networking behaviour (Greve and Salaff 2003; Renzulli et al. 2000), since they may have more need for the benefits offered by 'strong ties' in an uncertain environment, such as trust, reciprocity and credibility, which can help to mitigate the effects of interpersonal dissimilarity and attributed prejudices (Ibarra 1993). Therefore, it is proposed that:

Hypothesis 3: Gender of the business-owner moderates the effects of the legitimacy signals on access to critical resources.

Figure 11.1 provides a representation of the model.

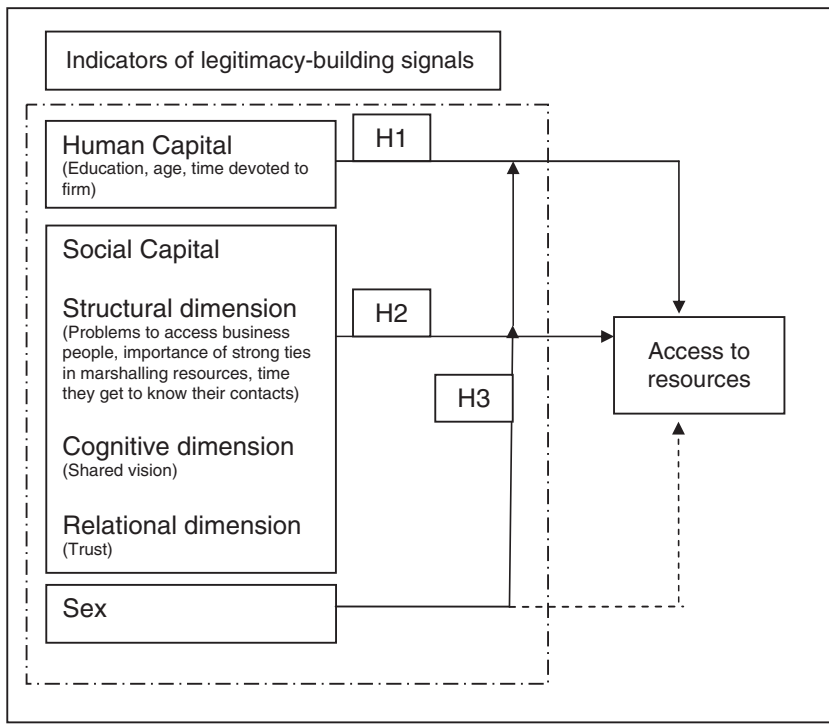

Figure 11.1 Proposed model

METHODOLOGY

The empirical data come from a survey of firms in knowledge intensive industries (ICE, 2005),[1] of small size (less than 50 employees) and founded from 2002 onwards (six years old). The age limit was imposed, since legitimacy is crucial in the early years of existence of a new venture when it is seeking resources, since there is typically little past economic performance on which the holders of resources can economically and rationally judge them, whereas established or successful organizations have legitimacy, at least in part, because of their sustained profitability (Zimmerman and Zeit 2002). Since established predictors of success are absent, outsiders must rely on 'symbolic signals of competence' when deciding whether to invest in new organizations[2] or not (Sine et al. 2006, p.123).

In order to obtain the population of 32 684 firms the SABI database (Analysis System of Iberian Balances) has been used. All the firms were contacted in those sectors in which there were less than 1000 firms. In the rest of the sectors, we selected 1000 firms with more updated information and, in order to oversample the number of women, 250 firms in which the leading business-owner according to the database was a man were replaced by firms in which the leading business-owner was a woman.[3] From this sample (7068), some firms were eliminated due to incorrect addresses, leaving a sampling frame of 5842 firms. We received 1030 questionnaires yielding a response rate of 17.63 per cent.[4]

These responses were obtained during the administration of the survey, from June 2008 until April 2009. First, following the total design method described by Dillman (2000), we mailed questionnaires, accompanied by prepaid return envelopes and cover letters, to the business-owners of the firms in the sample frame. The cover letters identified the sponsor of the study and explained its purpose and importance. We assured business-owners of confidentiality and promised them a report of the aggregated findings once the study was completed. A follow-up postcard and reminder letter with a replacement survey questionnaire followed the initial mailing. From the postal survey we received 277 questionnaires. In order to improve response rates, during March and April 2009 we telephoned potential respondents and received 753 questionnaires more. From the 1030 questionnaires received, and for the purposes of this study, we eliminated those which did not match the criteria of being less than six years old. The final sample consisted of 447 male and 277 female business-owners, 724 firms in total. A response bias test revealed no significant differences between respondents and non-respondents with respect to number of employees, gross revenues, firm age and the age and education of business owners.

The survey consisted of answering a questionnaire, which was designed to measure business characteristics, characteristics of the lead entrepreneur, the team (where a team existed), the networks and social capital, time distribution and performance. For this chapter, only a few variables have been used and are described in Table 11A.1 in the Appendix. The questionnaire was developed using questions and scales validated in previous research and the questions were pilot tested on six men and women business-owners.

With the aim of corroborating the hypotheses that have been proposed previously, several analyses have been carried out. First, the characteristics of the sample were analysed with t-tests, which enable us to identify average differences between men and women business-owners. Factorial explanatory analyses were run for those variables which were operationalized with scales. Subsequently, the influence of legitimacy indicators on access to resources was analysed using a stepwise regression. First, the main effect variables were introduced and, once controlled; in a second step it was tested whether the interactions of sex with the independent variables improve the fit of the model (with a forward method). We have taken into account the potential multicollinearity problems observing the correlation table (Table 11A.2 in the Appendix), centring the predictor variables (detracting its mean) before calculating the interaction terms (Jaccard and Turrisi 2003) and testing that the parameters are within the acceptable thresholds (VIF<10).

RESULTS

Factorial explanatory analyses were run for those variables which were operationalized with scales.[5] These analyses for the cognitive dimension of social capital, the relational dimension of social capital and the access to critical resources extract only one factor each, with alpha values of 0.883, 0.889 and 0.611 respectively (Table 11.1). Due to the correlation between the cognitive and relational dimensions of social capital (Pearson correlation = .590, sig. = .000), a factorial analysis was carried out with the items of the two scales. Two factors were obtained which coincide with the cognitive and relational dimension. These factors were used in the regression to avoid multicollinearity problems.

Analysing the t-tests, we can observe that there are some differences between the indicators of legitimacy building signals for men and women business-owners (Table 11.2).[6]

The findings suggest that women business-owners, in comparison with their male counterparts: operate more frequently in external premises at start-up; are younger (they are on average in the 25–34-years-old interval

Table 11.1 Factorial analysis of cognitive and relational dimensions of social capital

	Factor 1	Factor 2
We share goals and objectives with our contacts	.828	
We share the same ambitions and visions than our contacts	.812	
We understand the strategies and needs of each other	.781	
We share a common language, vocabulary and terminology	.738	
We agree in how to handle work relationships	.710	
We share the social and cultural values with our contacts	.647	
These business contacts always maintain the promises made		.878
I can trust in my contacts, without having fear that they could take benefit from me or my firm, even if the opportunity appears		.865
The relationships with these contacts are characterized by mutual respect		.829
The relationships with these contacts are characterized by helping each other from time to time		.801
In the relationships with my contacts both parts try to avoid making demands that could harm seriously the other's interest		.582
Autovalues	5.841	1.538
% Explained Variance	34.237	32.841
Alpha	0.883	0.889

Note: % total explained variance: 67.078 KMO test: .911 Barlett's spheric. test: O^2 = 4751.235, df: 55, sig. .000.

in comparison with men who are in the 35–44 interval); devote less hours per week to the business (although men and women devote between 50 and 59 hours); state less problems in meeting business people outside their inner circle (although men and women on average seem to have these problems only to some extent); rely more on strong ties for acquiring resources and perceive more like-mindedness with their network contacts. There are no differences in terms of educational level, the durability of the relationships with their personal discussion network, the relational dimension of social capital or their access to external resources.

Table 11.2 Indicators of legitimacy-building signals for men and women business-owners

	Men	Women	Significant difference
Place where the firm started to operate	3.0519 (1.29898)	3.3118 (1.18906)	Yes (t = −2.712, sig = .007)
Business-owner's age	3.0989 (.97521)	2.9051 (.88025)	Yes (t = 2.673 , sig = .008)
Educational level	2.8386 (.65750)	2.7709 (.66334)	No (t = 1.338, sig = .181)
Hours devoted per week	3.71 (1.091)	3.29 (1.013)	Yes (t = 5.202, sig = .000)
Problems meeting business people	1.75 (1.063)	1.51 (.936)	Yes (t = 3.088, sig = .002)
Average length of time knowing their contacts	14.0204 (8.43184)	15.0044 (8.54836)	No (t = −.975, sig = .330)
Weak ties important for marshalling resources	1.35 (.549)	1.26 (.512)	Yes (t = 1.984, sig = .048)
Elements shared with network contacts	−.0806859 (.1282698)	.1282698 (.97540137)	Yes (t = −2.717, sig = .007)
'We share goals and objectives with our contacts'	5.15 (1.570)	5.42 (1.560)	Yes (t = −2.247, sig = .025)
'We understand the strategies and needs of each other'	5.34 (1.331)	5.55 (1.367)	Yes (t = −2.010, sig = .045)
'We agree in how to handle work relationships'	5.41 (1.367)	5.71 (1.320)	Yes (t = −2.893, sig = .004)
'We share the social and cultural values with our contacts'	5.20 (1.540)	5.48 (1.490)	Yes (t = −2.382, sig = .017)
Trust within relationships	−.0097703 (.97115451)	.0155323 (1.04584721)	No (t = −327, sig = .744)
Access to resources	.0077672 (1.05712012)	−.0124335 (.90292216)	No (t = .254, sig = .799)

Subsequently, the influence of the indicators of legitimacy building signals on access to resources was studied carrying out a regression (Table 11.3).

'Access to resources' was positive and significantly predicted by business-owners' age and educational level. However, 'devoting more hours to the

Table 11.3 Regressions on access to external resources

	Model 1	Model 2	VIF
	β	β	
Place where the firm started to operate	.128**	.135**	1.036
Sex	−.088	−.076	1.082
Business-owner's age	.140**	.148**	1.135
Educational level	.140**	.132**	1.032
Hours devoted per week	−.148**	−.225***	1.445
Problems meeting business people	−.170***	−.176***	1.125
Average length of time knowing their contacts	.155**	.162***	1.145
Weak ties important for marshalling resources	−.103*	−.109*	1.145
Elements shared with network contacts	.109*	.105*	1.062
Trust relations with network contacts	−.025	−.040	1.071
Multiplicative effect of sex and number of hours		.145**	1.487
	R^2c	R^2c	
	.135	.146	

Note: *p < 0.1; **p < 0.05; ***p < 0.01.

business per week' is related negatively with 'a favourable perception of access to external resources'. It might be that these business-owners either have higher expectations or devote more hours to compensate for the lack of other resources. With respect to social capital, those with more problems in meeting business people outside of their inner circle and those with less durability in their relationships with the key contacts of their personal discussion network have a less favourable perception of their access to resources.

Two factors are positively related to accessing external resources in these firms; 'perceiving more cognitive elements shared with their contacts' (like-mindedness) and 'relying on strong ties for marshalling resources' (although marginally significant, $p < 0.1$). However, both the perception of more trust within the networks and being a man or a woman do not have a direct impact on access to resources. In addition, used as a control variable, 'starting the firm in external premises' is related positively with a perception of 'access to external resources' that improves the ability of the firm to do business.

Subsequently, there is a need to review how this evidence corroborates or not the hypotheses proposed previously. First, hypothesis 1, about

business-owners with more human capital having more favourable access to critical resources, is partially supported. Age (as a proxy of experience) and educational level are indicators of legitimacy building signals, helping to project an image of capability to the business realm which favours marshalling other type of resources. Conversely, it seems that the number of hours devoted to the firm does not contribute to explaining access to critical resources.

Second, hypothesis 2, about business-owners with specific social capital having more favourable access to critical resources, is also partially supported. The variables that operationalized the structural dimension contribute positively to tapping into external resources. These are: not having problems with contacting others in the business realm; durability of their personal network contacts; and the reliance on strong ties for marshalling resources (this latter one only marginally). The cognitive dimension of social capital (like-mindedness) contributes only marginally to improving the access to resources and the relational dimension (trust within the networks) is not related to it. It might be that the selected structural variables in some way encompass elements of trust in established relationships.

Finally, hypothesis 3, about how the gender of the business-owner moderates the effects of the legitimacy signals on access to resources, is partially supported. Only one moderator effect was included in a 'forward' step regression, being significantly related to the dependent variable and contributing to increasing the fit of the model (R^2c). Those women who devote more hours to their firm have a more favourable perception of access to external resources, which is contrary to the findings for the whole sample.

CONCLUSIONS AND IMPLICATIONS

This chapter uncovers the impact of legitimacy-building signals for new venture success. It also sets out to shed light on how the institutionalized structures of the business environment affect women in their entrepreneurial activity. They seem to have an equally favourable perception of their access to external resources and devoting more hours to their firms' impacts in a positive way for them in reinforcing this perception.

From the findings obtained we propose that the implications of this research are two-fold. First, for policy-makers, since they should encourage and facilitate networking in order to allow business-owners to gain wider access to certain people within the business realm that can provide valuable resources and especially information for them. Secondly, for

women entrepreneurs, since the findings warn them that they might suffer some legitimacy problems due to their tendency to start businesses at a younger age than men, which, in turn, can be linked to less developed networks of contacts and more family responsibilities that impose competing demands on their time. In relation to this fact, it can be proposed that, although the structure normally implies some constraints for them due to the gender-belief system, women can build a bridge between agency and structure through networking. This is in line with women reporting fewer problems in accessing powerful people within the business realm and more like-mindedness within their contacts than their male counterparts, which may enable the transfer of knowledge and the development of reputation within relationships. Another issue, apart from networking, that favours their access to external resources is their commitment to the firm in terms of hours devoted to it.

Taking into account the findings of this research and its limitations, we propose two future avenues of research. First, with respect to the content of this work, we propose that legitimacy is a relevant concept even for those new ventures which do not pursue growth but rather seek survival and a degree of sustainability, since, as in the case of growth-oriented firms, they need access to resources to continue operations. As a consequence, more research is needed on the influences on legitimacy to improve our understanding of how firms could gain the favour of resource gatekeepers. In addition, with respect to the methodology, in-depth interviews based on a qualitative approach could provide additional valuable insights into these quantitative results (Welter and Lasch 2008), contributing a more comprehensive picture of women's entrepreneurship (de Bruin et al. 2007).

NOTES

1. This encompasses the following activities according to CNAE – Economic Activities National Classification – codes (64) Mailing and telecommunications, (65) Financial brokerage, (66) Assurances and pensions, (67) Auxiliary activities of financial brokerage, (70) Property developers and real estate agencies, (72) Computing activities, (73) Research and Development, (74) Other business activities, (80) Education, (85) Health and veterinary activities and social services.
2. Littunen (2000) considers that the critical operational phase is four to six years, therefore the upper limit will be considered in this study for the selection of the sample.
3. Taking into account that from the Spanish self-employed population, 31 per cent are women (INE: Encuesta de Población Activa 2008 first trimester).
4. The response rate is calculated with respect to the sampling population, although from the responses received it has been observed that some firms have been operating more years than the established criteria and were part of the database due to a later change in their legal form.

5. Support was found for the reliability and internal validity of these measures. The standardized factor loadings are all above 0.5 (recommended minimum) and all alpha levels are above the .60 threshold.
6. There are no significant differences regarding the age of the firm (t = 1.696; sig. = .090) but men are leading larger firms with respect to number of employees (t = 2.919; sig. = .004). With respect to the original variables, from which the factors were extracted, any of them from the access to external resources scale or from the relational dimension scale showed differences in means between men and women business-owners.

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APPENDIX

Table 11A.1 Description of variables

Name of variable		Description of variable
Place where the firm started to operate		Operationalized as 1 for home, 2 for incubator, 3 for partially home and premises and 4 for external premises
Sex		Operationalized as 1 for women and 0 for men
Human capital	Educational level	Operationalized as 1 for primary education, 2 for secondary education, 3 for graduate education and 4 for postgraduate education
	Age	Intervals: less than 25, 25–34, 35–44, 45–54, 55–64, 65 or more
	Number of hours devoted to the firm	Intervals: less than 29, 30–39, 40–49, 50–59, more than 60
Structural dimension of social capital	Problems meeting business people	To what extent do you ever have problems meeting other business people outside of your personal contact network? 5 point Likert variable (1 – not at all; 5 – a great deal) Shaw et al. (2005)
	Average length of time knowing their contacts	Durability of the contacts asking about the five people with whom the individual most regularly discuss business matters, that is, the entrepreneur's personal contact network (Shaw et al. 2005)
	Weak ties important for marshalling resources	After they signal the resources acquired from strong ties, weak ties and formal ties (associations) – within the Aldrich and Carter (2004) scale. Operationalized as 1 for strong ties, 2 for weak ties and 3 for formal ties
Cognitive dimension of social capital	Elements shared with network contacts	Ye (2005). Items as: 'We share goals and objectives with our contacts' or 'We understand the strategies and needs of our contacts' are rated within a 7-point Likert scale
Relational dimension of social capital	Trust relations with network contacts	Kale et al. (2000). Items as: 'In the relationships with my contacts both parts try to avoid making demands that could harm seriously the other's interest' are rated within a 7-point Likert scale
Dependent variable	Access to resources critical for competing	Please rate the IMPACT of the ease of obtaining each of the following external environmental factors as they relate to your company's ability to do business: access to finance, access to qualified employees, access to key market information, access to consultancy/advice. (5-point Likert scale). Scale adapted from Brush and Hisrich (2000)

Table 11A.2 Correlation table

	1	2	3	4	5	6	7	8	9	10	11	12
1. Access to external resources	1											
2. Sex	−.010	1										
3. Place where the firm started to operate	.082(*)	.099(**)	1									
4. Business-owner's age	.092(*)	−.100(**)	.009	1								
5. Educational level	−.024	.010	−.041	.077(*)	1							
6. Hours devoted per week	−.107(**)	−.187(**)	−.070	.012	−.054	1						
7. Problems meeting business people	−.149(**)	−.111(**)	−.121(**)	.024	.036	−.015	1					
8. Average length of time knowing their contacts	.181(**)	.059	−.044	.243(**)	−.063	.005	−.089	1				

9. Weak ties important for marshalling resources	−.015	−.079(*)	.020	.103(*)	−.029	−.009	−.038	−.111	1			
10. Elements shared with network contacts	.091(*)	.102(**)	.052	−.040	−.023	−.073	−.182(**)	.006	.015	1		
11. Trust relations with network contacts	.034	.012	−.046	−.075(*)	.015	.017	−.111(**)	−.042	−.034	.000	1	
12. Multiplicative effect of sex and number of hours	.020	−.196(**)	−.015	.028	−.002	.606(**)	.055	−.051	.013	−.080(*)	.033	1

Note: *p < 0.05; **p < 0.01.

12. Antecedents of the entrepreneurial orientation of the firm: the case of St Petersburg, Russia

Tatiana Iakovleva

INTRODUCTION

Despite the fact that entrepreneurship scholars have developed numerous typologies to describe alternative perspectives of entrepreneurship, there is still a lack of consensus regarding how to characterize entrepreneurship (Lumpkin and Dess 1996). This lack of consensus has impeded progress towards building and testing broader theories of entrepreneurship. To assist in this aim, the emphasis shifted from studying the basic entrepreneurial problem of entering business to studying entrepreneurial processes. This implies the methods, practices and decision-making styles that managers use to act entrepreneurially, which can be named entrepreneurial orientation (Lumpkin and Dess 1996).

Recent studies show that firms employing innovative, proactive strategy, referred to as entrepreneurial orientation (EO), often show better performance and growth and thus contribute to their national economies (Iakovleva 2005; Rauch et al. 2004; Wiklund 1999). Entrepreneurial orientation can be broadly defined as a concept that addresses the mindset of firms engaged in the pursuit of new ventures. Thus, an EO may be viewed as a firm-level strategy-making process used to enact organizational purpose, sustain vision, and create competitive advantages (Rauch et al. 2004). While a number of articles highlighted the importance of the EO construct for firm growth and performance, less attention has been paid to studying the antecedents of the EO of a firm. Based on these suggestions and utilizing critical realism as a philosophical point of departure, this chapter focuses on the following research question: 'what factors are associated with the EO of a firm?'

THE CONTEXT OF THE STUDY

The concept of 'entrepreneurship' only emerged in Russia after 1989 when the law concerning 'entrepreneurial activities' was passed. The 'perestroika' period was associated with a reconstruction of the economy and the collapse of the Soviet Union. During this period, many people were forced to become self-employed, and thus, numerous small, privately owned businesses appeared. These businesses were the newly opened or privatized state firms. Today, entrepreneurship has become a high-priority topic in political and economic debates in Russia. By the end of 2003, there were 8 946 500 private economic entities in Russia. Small entrepreneurship entities include three categories of enterprises: individual entrepreneurs (IEs); farm enterprises (FEs), and small enterprises registered as legal entities (SEs). In the research reported here, SEs are the object of analysis. By the end of 2003, there were 891 000 SEs in the Russian Federation, employing about 12 per cent of the working population. SEs generate between 12–15 per cent of the gross domestic product (RSMER report 2004). This study focuses on the city region of St Petersburg, where SEs account for 21.6 per cent of all private economic entities (RSMER report 2004), employing approximately 26 per cent of the working population in the city and generating 57 per cent of sales revenues.

Research Related to Entrepreneurship in Russia

Economic research on entrepreneurship in countries with collectivist orientations is underdeveloped with only a few studies employing a rigorous scientific approach (Tkachev and Kolvereid 1999). The majority of studies are descriptive, covering issues related to the external environmental conditions in which entrepreneurs operate (Ylinenpää and Chechurina 2000), as well as the background characteristics and motivation issues of the entrepreneur (Bezgodov 1999; Puffer and McCarthy 2001). The majority of studies carried out in Russia on entrepreneurship are not theoretically based and are of a descriptive character. While these studies provide interesting background information of business in Russia, they are quite a-theoretical and do not link the named factors with real outcomes, resource acquisition, strategy or performance. The present study applies a critical realism philosophy base as described below and utilizes Western theories related to the construct of entrepreneurial orientation in the context of the transitional Russian economy.

Research Philosophy of the Study

The present study employs the critical realism approach, which is based on ontology close to that of positivism. The external world consists of both observable and unobservable phenomena. Epistemologically, scientific realism deviates from positivism because it implies that we also know the unobservable phenomena (Miller 1987). However, it is difficult to establish the truth of unobservable units. Critical realism accepts the way we understand the perceived facts depends partly upon our beliefs and expectations (Bunge 1993).

Thus, within critical realism, a theoretical framework guiding the research is of great importance. Hypotheses should be derived from theory and tested using empirical data. The nature of scientific knowledge is seen as cumulative, and studies should therefore utilize theory that has been developed in previous research. Critical realism assumes that regularities are dependent on context and conditions, and that causes are seen as the tendencies to produce effect. This dependency on context and conditions has implications for how causations can be understood. In critical realism, causation is not understood on the basis of a regular succession of events model as it is in positivism. Explanation depends on identifying causal mechanisms, how those causal mechanisms work, whether they have been activated, and if so, under what conditions (Sayer 2000). Therefore, causes are not determining actions and thus must be seen as 'tendencies' that produce particular effects (May 2001).

It was important for the present study to understand the context-related conditions. As a result, a pilot study was conducted to consider the context. The present study is the part of a larger research project on factors related to the performance and growth of the small and medium-sized businesses in the Russian context. The pilot study was conducted to uncover not only the antecedents of the entrepreneurial orientation context, but also to deal with issues related to the performance of small firms.

Pilot Study

St Petersburg is a major city in Russia. In cultural, political, social and economic terms the Russian Republic represents a country in transition (Bushmarin et al. 1995). The latter authors described this type of environment as one where there is considerable transformation change and where the magnitude of change represents total abandonment of traditional behaviour, expectations and theories in favour of completely new alternatives or innovations. However, the relevance of the theories developed in

Western countries to explain venture performance in St Petersburg may provide partial insight. A pilot study was conducted in St Petersburg with ten entrepreneurs, who cited and discussed factors leading to superior business performance. Thus the influence of local context was considered. Semi-structured interviews were conducted in autumn 2002. The interview guide, translated into English, is presented in the Appendix. Each interview lasted about one and half hours and the interviews were recorded and/or manually transcribed. Respondents were asked how they started their businesses. They provided details surrounding the development of their ventures and they were asked to indicate whether they believed their ventures were successful. In addition, respondents were asked to cite three main factors which they believed would enhance the success of their ventures. For the pilot study, information was gathered from seven male respondents and three female respondents. Four firms were engaged in manufacturing activities, four firms in sales activities and two firms in service activities. Nine firms were five or more years old, and one firm was less than one year old. One firm had no employees, while the largest firm employed 97 people.

The most frequently cited factor leading to superior firm performance was the entrepreneur's personality. Personal motivation, leadership qualities, the ability to see new opportunities and to adapt to the environment were cited as being crucial for achieving business success. The second factor was the firms' resources. Next, unique knowledge, skills and expertise about the products were cited. The third most frequently cited factor was the strategy selected. All respondents cited the ability to change and adapt to the environment as a critical skill for survival. Innovation was also cited by owners of manufacturing firms. Interestingly, owners of relatively unsuccessful firms suggested that the hostile environment had restricted their firms' development. Most notably, competition and laws/regulations were viewed as restrictive elements that hindered business development. Conversely, owners of superior performing firms did not suggest that the external environment was hostile.

As noted above, the entrepreneur's personality, firm resources and entrepreneurial orientation were mentioned as three main success factors by Russian entrepreneurs. This is synonymous with the main findings in Western literature regarding a firm's performance (Shane and Kolvereid 1995; Wiklund 1999). It was therefore concluded that themes highlighted in Western literature were also applicable when exploring the performance of firms in St Petersburg. Thus, with regard to antecedents of the entrepreneurial orientation, it was decided to derive hypotheses guided by theoretical perspectives.

THEORETICAL BASE

The construct of EO is rooted from the work of Mintzberg (1973), who asserts that entrepreneurial firms tend to take more risks and be more proactive in searching for new business opportunities. Further, Miller (1983) views entrepreneurship as a multidimensional concept encompassing a firm's actions relating to innovation, risk-taking and proactive measures. Building on the work of these authors, Covin and Slevin (1989) have presented a strategic posture scale. They assert that the entrepreneurial-conservative orientation of a firm is demonstrated by the extent to which top managers are inclined to take business-related risks, favour change and innovation, and compete aggressively with other firms. Guided by Miller's (1983) conceptualization, Covin and Slevin (1989) have proposed the following three dimensions of EO: innovativeness, risk-taking and proactive action.

Schumpeter (1934) emphasized the role of innovation in the entrepreneurial process. Innovativeness reflects a firm's tendency to engage in and support new ideas, novelty, experimentation, and creative processes that may result in new products, services, or technological processes (Lumpkin and Dess 1996). The concept of risk-taking is frequently used to describe the behaviour of the entrepreneur (Lumpkin and Dess 1996; Shane 1994). Risk-taking involves taking bold action by venturing into the unknown, borrowing heavily, and/or committing significant resources to ventures in uncertain environments (Rauch et al. 2004). Proactive action can be viewed as maintaining an opportunity-seeking and forward-looking perspective characterized by the introduction of new products and services ahead of competitors (Rauch et al. 2004). A first initiator can control access to the market by dominating distribution channels. By introducing new products and services, a firm can establish industry standards. These dimensions comprise a basic strategic orientation scale (Covin and Slevin 1989). The conceptual argument suggests that firms benefit from highlighting newness, responsiveness and a degree of boldness. There is a link between firms exhibiting innovativeness, risk-taking proactive action, and firm growth and performance (Rauch et al. 2004; Zahra 1991; Zahra and Covin 1995).

However, the concept of EO, although widely used in the entrepreneurship field, has some potential weaknesses. Rauch et al (2004) noticed that findings on the association between EO and firm growth and performance only apply to surviving firms. The authors argue that it might be possible that risk-taking implied by EO might also lead to higher chances of failure, suggesting that a better understanding of EO and its antecedents is needed.

Resources and Entrepreneurial Orientation

Lumpkin and Dess (1996) argue that entrepreneurial orientation takes into consideration entrepreneurial processes which are the methods, practices, and decision-making styles managers use to act entrepreneurially. These include processes such as experimenting with promising new technologies, being willing to seize new product-market opportunities and having a predisposition to undertake risky ventures. Additionally, Lumpkin and Dess (1996) argue the extent to which each of these dimensions is useful for predicting the nature and success of a new undertaking. Predictability may be contingent on either external factors or internal factors, such as the organizational structure or the characteristics of founders and top managers. This implies the link between resources and EO as well as self-efficacy and EO.

Firm resources can be best studied employing the resource-based view (RBV), which argues that entrepreneurs and firms with rare and unique resources have a competitive advantage and will report superior firm growth (Barney 1991; Penrose 1959). This perspective originates from Penrose's (1959) theory of firm growth. She asserted that the rate and direction of growth are strongly influenced by the organization and its bundle of resources. A firm is seen as a collection of resources distributed between different users over time as determined by administrative decisions (Penrose 1959). Consequently, a firm is seen as consisting of heterogeneous bundles of resources. By combining such bundles in specific ways, a firm can create unique capabilities and develop a sustainable competitive advantage (Barney 1991; Conner 1991). Barney (1991) described resources as all the assets, capabilities, organizational processes, firm attributes, information and knowledge controlled by a firm which enables the firm to conceive and implement strategies that improve its efficiency and effectiveness.

Empirical studies show the existence of relationships between organizational resources (Chandler and Hanks 1994b; Heeley 1997), availability of financial resources (Bamford et al. 1998; Cooper et al. 1994), organizational or individual networks (Borch et al. 1999; Donckels and Lambrecht 1994), and firm performance.

The Link between Resources and EO

According to Brown and Kirchhoff (1997), resources alone may not be suitable for examining the more externally oriented small growing firms. One shortcoming of the resource-based view is how strategic choice and entrepreneurial orientation are handled. It could be argued that while

resource ownership and efficient use of resources tend to be the driving forces of organizational activity, the way in which resources are used makes all the difference. In this context, the link between resources, strategies and growth was proposed by Grant (1991), who argues, that the 'resources of the firm are central considerations in formulating its strategy. They are the primary constants upon which a firm can establish its identity and frame its strategy, and they are primary sources of the firm's profitability' (Grant, 1991, p. 133). Due to continual environmental changes, entrepreneurs must choose strategic alternatives, although their options might be limited within the established framework of available resources (Penrose 1959; Spanos and Lioukas 2001).

Some resources are exploited primarily through cost advantages and thus are more likely to be employed within a competitive aggressiveness approach. Firms could lack the unique and valuable resources needed for low-cost leadership but have highly developed elements of structural capital (Stewart 1997). Such structures and processes could enable them to create new resources more quickly and cheaply than their rivals. A wider range of resources will enhance a firm's strategies as the firm builds up its strategies based upon the resources that are available (Lumpkin and Dess 2001). The traditional view of entrepreneurial orientation stresses the importance of resources in determining entrepreneurial orientation (Brown and Kirchhoff 1997; Covin and Slevin 1991). It can be argued that EO should arise from the resource base of the firm.

Therefore, the following research question arises:

Research question 1: Do firms with unique resources report superior EO?

Several studies have detected those firms with better access to financial capital report significantly higher levels of firm performance (Carter et al. 2006; Wiklund 1999). Financial capital provides a buffer against unforeseen difficulties (Carter et al. 2004). In addition, financial capital provides the resources which allow for innovation and change, which can then enable firms to identify and/or create new market opportunities (Zahra 1991). This discussion suggests the following hypothesis:

Hypothesis 1: Firm financial resources are positively associated with EO.

Firms able to leverage organizational resources, such as managerial competence, firm climate, and skilled, knowledgeable employees have been found to report superior levels of firm performance as well as more

innovative strategies (Chandler and Hanks, 1994b; Spanos and Lioukas, 2001). As a result, the following hypothesis is proposed:

Hypothesis 2: Firm organizational resources are positively associated with EO.

Firms with strong social resources often report superior firm performance (Borch et al. 1999). Social resources can be viewed as organizational or individual networks (Donckels and Lambrecht 1994) related to face-to-face relationships and informal interpersonal exchange (Dees and Starr 1992). Previous working relationships, voluntary connections, kinship and community ties lay the groundwork for independent new ventures (Birley 1985; Starr and MacMillan 1990). This discussion suggests the following hypothesis:

Hypothesis 3: Firm social resources are positively associated with EO.

Self-efficacy and EO

As outlined earlier, the personality of an entrepreneur is often perceived to be an important factor underlying entrepreneurial orientation (Brown and Kirchoff 1997). Perceived self-efficacy is viewed as a central concept in entrepreneurship (Boyd and Vozikis 1994; Kickul and Krueger 2004) because it has a proven association with initiating and persisting achievement-related behaviour (Wood and Bandura 1989). Individuals gradually accumulate their self-efficacy through prior cognitive, social and physical experiences (Gist 1987). Prior successful enactment of a task can change one's expectations and help further reinforce one's self-efficacy. Wood and Bandura (1989) argued that self-efficacy affects an individual's thought patterns which can enhance or undermine performance. Specifically, if one has a high level of self-efficacy, he or she is more likely to set higher or more challenging goals, which raises the level of motivation and improves performance. A high level of self-efficacy helps individuals maintain their efforts until their initial goals are met (Gist 1987).

The ability of an entrepreneur or key decision maker to cite high levels of self-efficacy shapes a firm's strategy, which can result in superior firm growth. It is widely recognized that the founders and executives of an organization can exert important influences on the actions of the organization (Schneider et al. 1995). For example, the attraction-selection-attrition framework asserts the values of the founders. This will influence the value system in the organization because the founders will try to attract and select people who share their values (Schneider et al. 1995). As a

result, the values of the founders will exert important influences on the organizational culture. In newly established entrepreneurial organizations, founders of the organization will be able to shape the structures and strategies of the organization and will lead the organization in a direction that is consistent with their personal goals and preferences. Consequently, Lumpkin and Erdogan (1999) found that the personality characteristics of the entrepreneurs are associated with the EO. Brown and Kirchhoff (1997) found a weak association between resource-acquisition self-efficacy and a firm's EO. It can therefore be proposed that an entrepreneur's self-efficacy affects firm growth through the EO. The more opportunity oriented an entrepreneur is, the higher the probability is that he/she will choose a more innovative and proactive strategy, thus implying a higher degree of EO. This discussion leads to the following research question:

Research question 2: Do firms controlled by entrepreneurs citing high levels of self-efficacy report superior EO?

The core of an individual's self-efficacy is self-assessed competencies, which are individual beliefs about their personal 'capabilities to mobilize the motivation, cognitive resources, and courses of action needed to exercise control over events in their lives (Wood and Bandura, 1989, p. 364). Competencies considered as higher-level characteristics represent the ability of the entrepreneur to perform a job role successfully utilizing personality traits, skills and knowledge, which in turn are influenced by the entrepreneurs' experience, training, education, family background and other demographic variables (Bird 1995; Herron and Robinson 1993).

Entrepreneurs citing high levels of opportunity identification are able to recognize and develop market opportunities, which lead to a competitive advantage for their firms (Brush and Hisrich 1991; Chandler and Hanks 1994a). Opportunity identification can include identifying new market opportunities for products and services, discovering new ways of improving existing products, and forecasting customers' unmet needs (De Noble et al. 1999; Isaksen 2005). As a consequence, the following hypothesis is proposed:

Hypothesis 4: Firms controlled by entrepreneurs citing opportunity competence will report superior levels of EO.

Risk competence is a perceived ability to deal with uncertainty and risk. Chen et al. (1998) studied the association between self-efficacy and intentions to start a business. Risk competence showed a highly significant association with the intention to start a new business (Chen et al. 1998).

De Noble et al. (1999) detected that entrepreneurs citing high levels of risk competence run superior performing ventures. Hence, the following hypothesis is formulated:

Hypothesis 5: Firms controlled by entrepreneurs citing high-risk competence will report superior levels of EO.

Financial competence is related to the acquisition of financial resources. Lerner et al. (1997) found that entrepreneurs citing a high index of business skills (obtaining financing, budgeting, labour management, and planning) ran superior performing ventures with entrepreneurial strategy. Bezgodov (1999) found that obtaining financial capital was viewed as a success factor by Russian adults. This discussion suggests the following hypothesis:

Hypothesis 6: Firms controlled by entrepreneurs citing high financial competence will report superior levels of EO.

METHODOLOGY

Survey evidence was gathered from business leaders of small ventures located in St Petersburg, Russia. The data collection took place in April 2004, over a three-week period. Data was collected from the representative sample of 466 managers of the small enterprises in St Petersburg, Russia. Owners/managers of private companies in Russia generally refuse to participate in surveys unless they are obliged to do so by the authorities. Therefore, a face-to-face data collection process was selected to gather responses from a large number of respondents who would be encouraged to answer most questions on the structured questionnaire.

A cleared list of firms that had been established between 1989 and 2004 and employing less than 100 employees were considered as valid responses. Sole proprietorships were excluded. For the purpose of present research, it was important to ensure that respondents were key decision makers in the firm. According to Chandler and Hanks (1993), in small firms the decisions are often taken by the owner-manager. Therefore, the control question 'Are you responsible for the main decisions taken in the enterprise?' was included to ensure answers were collected from the key decision makers in the firm. Based on that criterion, responses from 44 respondents who were not key decision makers in their SEs were removed from the valid sample. The final sample consists of 382 enterprises. The valid sample focuses on limited liability companies, which comprise almost 84 per cent of the valid sample, and closed joint-stock companies, which comprise the remaining 6

per cent. Over 50 per cent of the firms have less than 25 employees, and 20 per cent have between 50 and 70 employees. Such companies are not listed on the stock exchange, which increases the probability that the strategic vision of such firms is defined by the owner or key manager.

Using a chi-square test, the industrial profile of the respondents in the valid sample (that is, 382 SEs) was compared with the population of firms (that is, 89 934 SEs) to assess whether the results from the valid sample can be generalized to the population of SEs in St Petersburg. The valid sample of respondents was not markedly different from the population at the 0.05 level of significance. About 45 per cent of the SEs in the sample operated in sales, 28 per cent in service and 27 per cent in manufacturing industries. The average age of respondents is 39; about 67 per cent of the respondents are male and 86 per cent of respondents have higher education.

Questions were mainly adapted from Western sources and back translated into Russian. Their validity in a Russian context was also considered. The questionnaire was reviewed by three Russian entrepreneurs, and several statements relating to firm growth were revised. The revised questionnaire was pre-tested on a sample of Russian students, after which it was tested on ten Russian entrepreneurs. To ensure eased completion and consistency, most questions in the structured questionnaire administrated to entrepreneurs in St Petersburg gave respondents the opportunity to select answers from a 5-point Likert scale.

Dependent Variable: Entrepreneurial Orientation

Entrepreneurial orientation was measured with the help of nine items. Three items are taken from Chandler and Hanks (1994a): 'we strive to be the first to have new products available'; 'we stress new product development'; 'we engage in novel and innovative marketing techniques'. Three items are taken from Covin and Slevin (1989): 'we emphasize a policy of growth primarily through external financing (borrowing, capital issues, etc.)'; 'in dealing with competitors we typically initiate actions which competitors then respond to'; 'we are very often the first business to introduce new products/services, administrative techniques, operating technologies'. Two items are taken from Miller and Friesen (1982); they were rescaled to a 7-point one-side Likert scale so that they would be in the same format as the other questions: 'owing to the nature of the environment, bold, wide-ranging acts are viewed as useful and common practice'; 'we have a strong proclivity for profitable, but risky, projects'. One item is taken from Lumpkin and Dess (2001): 'we have a strong tendency to be ahead of other competitors in introducing new products or ideas'. Cronbach's alpha for this component is 0.89.

Independent Variables

Firm resources variables

Firm resources were operationalized by three components – financial capital, organizational capital and social capital. Financial capital was measured using three questions. The following question was derived from Westhead et al. (2003): 'Relative to competitors, we have advantageous financial resources', while the following questions were derived from Shane and Kolvereid (1995): 'Bank loans are easily available for us' and 'capital from suppliers or customers is easily available for us'. Cronbach's alpha for this component is 0.73.

Organizational capital was measured using the following three questions used by Spanos and Lioukas (2001): first, 'our firm's managerial competencies are high'; secondly, 'we have a good firm climate' and, thirdly, 'our employees have superior knowledge and skills'. Cronbach's alpha for this component is 0.67. Social capital was measured using the following four questions taken from Borch et al. (1999): first, 'employees networks are an important information source'; secondly, 'we use our firm's networks to influence the environment'; thirdly, 'our networks broaden our opportunities'; and lastly, 'the manager's own networks are an important firm resource'. Cronbach's alpha for this component is 0.76.

Self-efficacy variables

Entrepreneurial competence was measured with reference to the self-efficacy concept, opportunity competence, risk competence and financial competence. Following Bandura (2001), self-efficacy was measured with reference to 11 statements, and each statement was measured on an eleven point scale ranging from 0 = 'not confident at all' to 10 = 'complete confidence'. Opportunity competence was measured with regard to the following three questions used by De Noble et al. (1999): first, 'ability to discover new ways to improve existing products'; secondly, 'ability to design products that solve current problems'; and, thirdly, 'ability to create products that fulfil customers' unmet needs'. Cronbach's alpha for this component is 0.76. Risk competence was measured with regard to four questions: first, 'ability to tolerate unexpected changes' (De Noble et al. 1999); secondly, 'ability to persist in the face of adversity' (De Noble et al. 1999); thirdly, 'ability to take calculated risks (Chen et al. 1998); and, fourthly, 'ability to make decisions under uncertainty and risk' (Chen et al. 1998). Cronbach's alpha for this component is 0.82. Financial competence was measured with regard to four questions, three of which were used by De Noble et al. (1999): first, 'ability to develop and maintain favourable relationships with potential investors'; secondly, 'ability to develop

relationships with key people who are connected to capital sources'; and, thirdly, 'ability to identify potential sources of funding'. One question was used by Isaksen (2005): 'ability to obtain sufficient funds if necessary'. Cronbach's alpha for this component is 0.86.

Control variables

Three control variables were selected and introduced into the regression models – industry of operation, market of operation, and role of the respondents in the firm:

1. Industry of operation: a distinction was made between manufacturing, sales/distribution and service activities. Three binary industry variables were computed (1 = manufacturing, otherwise 0; 1 = sales, otherwise 0; and 1 = service, otherwise 0). Manufacturing was regarded as the reference category.
2. Market of operation: respondents were asked to indicate in which market the majority of their sales were sold. A binary variable was computed (1 = local/St Petersburg, 0 = other). Fifty-six per cent of respondents made the majority of their sales in the local St Petersburg market.
3. Respondent role: a binary variable was computed (1 = founder or principal owner of the firm, 0 = employee such as director or manager). Fifty-six per cent of respondents were founders or principal owners. All the respondents, however, were key decision makers in the surveyed firms.

Other controls such as firm's age, firm's equity form, firm's size, respondent's age, gender and education were also tested but since there was not found to be any effect on the dependent variable they are not included in the present analysis.

RESULTS AND IMPLICATIONS

Ordinary least squares (OLS) multiple regression analysis is used to test the hypotheses presented above. To deal with missing data in the regression, the complete case approach (Hair et al. 1998) was applied. Missing data is a fact of life in multivariate analysis (Hair et al. 1998). To reduce the data entry error, each variable's frequency was monitored. Therefore, only respondents who provided complete data for all variables included in particular model are included in the regression analysis. The number of respondents will vary with regard to the different

research models. For each research model a separate alternative regression analysis was performed with mean substitution for missing values. This is done to ensure that results are stable with regard to the complete data and substitution data sets. Mean substitution only applies to the metric variables included in the analysis. No major differences in the results of the analysis with mean substitution and with complete case approach were found.

A hierarchical regression procedure is applied with the increase of the R^2 monitored with the inclusion of blocks of variables. The base model relates to control variables (that is, industry, market and respondent's ownership role). Blocks of variables corresponding to specific hypotheses are added, in turn, to the base model. The tolerance values are reported for each regression. An inspection of the residual plot and the normal probability plot for each model suggests that both the homoscedasticity and normality assumptions are met in the multivariate set of variables in the respective models.

The hypotheses presented above suggest the importance of the financial, organizational and social resources for the firm's EO, as well as the importance of the opportunity, risk, and economical competence for the EO. Correlation coefficients for all variables are presented in Table 12.1. Results indicate that almost all the above mentioned variables correlate with the EO of the firm.

Resources and Entrepreneurial Orientation

The first three hypotheses, 1, 2 and 3, relate to the effect of the resource variables on EO. Variables associated with the EO are presented in Table 12.2. The base model has an adjusted R^2 of 0.020 and is significant at the 0.05 level. The three resource variables were then entered in a block. Model 1 has an adjusted R^2 of 0.109 and is significant at the 0.001 level. Model 1 explains more of the variance in the dependent variable than the base model. The ΔR^2 of 0.096 is significant at the 0.001 level. All resource variables are individually and significantly associated with the EO. Financial resources are positively associated with the EO at the 0.001 level. Organizational and social resources are positively associated with the EO at the 0.01 level.

By statistical standards, the effect of financial, organizational and social resources on EO can be regarded as moderately large (Cohen 1977). Based on this result, it is safe to conclude that businesses wishing to employ a more entrepreneurial strategy will benefit from having better access to financial resources, developing strong organizational climate and employing wider social contacts.

Table 12.1 Correlation coefficients for all dependent and independent variables

Variables	M	SD	1	2	3	4	5	6	7	8	9	10	11	12
1. Sales	.32	.47	1											
2. Service	.42	.49	−.58**	1										
3. Local market	.541	.499	.087	.065	1									
4. Ownership (founder)	.458	.499	.003	−.099	.024	1								
5. EO	.015	1.03	−.061	.004	−.20**	−.001	1							
6. Financial capital	−.036	1.01	.036	−.026	−.103	−.21**	.22**	1						
7. Organizational capital	.023	1.01	−.17**	.108	−.037	−.107	.117	−.018	1					
8. Social capital	−.011	1.00	−.015	−.055	−.111	.117	.137*	−.004	.021	1				
9. Opportunity competence	.069	.942	−.060	.152*	−.010	−.043	.36**	.041	.17**	.010	1			
18. Risk competence	.003	.963	−.017	−.006	.040	−.053	.153*	.098	.27**	.010	−.008	−.007	1	
19. Financial competence	−.012	.976	.044	−.050	−.118	−.033	.21**	.49**	.111	.086	−.024	.026	.041	1

Notes:
* Correlation is significant at the 0.05 level (2-tailed); ** Correlation is significant at the 0.01 level (2-tailed).
Listwise n = 265.

Table 12.2 OLS regression analysis of resources associated with the EO

Variables	Base model	Model 1	Tolerance
Sales	−.055	−.045	.611
Service	−.029	−.013	.619
Local market	−.161***	−.123**	.946
Ownership (founder)	−.029	.025	.927
Financial capital		.247****	.944
Organizational capital		.143***	.960
Social capital		.133***	.986
R^2	.031	.0127	
Adjusted R^2	.020	.109	
ΔR^2		.096****	
F value	2.814**	7.180****	

Notes:
* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$; **** $p < 0.001$.
Standardized regression coefficients (betas) are displayed in the table, n = 353.

Self-efficacy and EO

Hypotheses 4, 5 and 6 relate to the self-efficacy variables effect on EO. Variables associated with EO are presented in Table 12.3. The base model has an adjusted R^2 of 0.024 and is weakly significant at the 0.1 level. The three self-efficacy variables were then entered in a block. Model 2 has an adjusted R^2 of 0.177 and is significant at the 0.001 level. Model 2 explains more of the variance in the dependent variable than the base model. The ΔR^2 of 0.169 is significant at the 0.001 level. All self-efficacy variables are individually and significantly associated with EO. Opportunity and financial competence are positively associated with higher levels of EO at the 0.001 level. Risk competence is positively associated with EO at the 0.01 level.

The results indicate that entrepreneurs with strong ability to find new opportunities, take risks, and organize control over the business activity have better chances to implement innovative and proactive strategy.

DISCUSSION

The present study focuses on the entrepreneurial orientation of a firm and addresses the following main research question: what factors are associated with the entrepreneurial orientation of a firm? The main objective was

Table 12.3 OLS regression analysis of self-efficacy associated with EO

Variables	Base model	Model 2	Tolerance values for Model 4
Sales	−.032	−.061	.624
Service	−.002	−.067	.609
Local market	−.147**	−.121*	.945
Ownership (founder)	−.013	.000	.986
Opportunity competence		.338****	.968
Risk competence		.138***	.999
Financial competence		.200****	.987
R^2	.024	.0193	
Adjusted R^2	.013	.177	
ΔR^2		.169****	
F value	2.149*	11.863****	

Notes:
* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$; **** $p < 0.001$.
Standardized regression coefficients (betas) are displayed in the table, n = 335.

to explore the antecedents to the innovative and proactive firm strategies labelled here as entrepreneurial orientation. In addition, to some extent, the study allows the replication of Western studies in the context of transitional Russian economy.

Findings Relating to the Resource Model

The resource-based theory was utilized to investigate the relationship between firm resources and firm EO. One research question and three hypotheses are related to the resource model. Findings reveal that firm resources together are associated with almost 11 per cent of the variation in EO. This finding is in line with previous research conducted in Western economies (Wiklund 1999; Wiklund and Shepherd 2005), although it should be acknowledged that the explanatory power of the model is moderate. There could be several reasons for that. First, the sample consists of the businesses which age ranging from newly established to ten years old. There could be some differences in the resource role for the development of a firm over this age range. For example, acquisition of financial resources might not be as important for already established businesses as it is for the new ones. Secondly, the study was performed in a context that is quite different from the stable Western economy. While the preliminary case studies showed that resources and entrepreneurial strategies are assumed to be important to Russian entrepreneurs as well as the confirmed validity

of their measures, it still could be possible that operationalization of the constructs is different in Russian contexts. Another explanation is that other theories can explain more variation of the EO construct than the one applied in this study.

The first hypothesis assumes that firms' financial capital explains some share of the variation in EO. This hypothesis was supported. The empirical findings show that financial resources are significantly associated with EO, which is consistent with previous research undertaken in developed economies (for example, Cooper and Gascon 1992; Wiklund 1999), revealing that some theories about entrepreneurial firms are applicable in both developed and transitional economies. Financial capital provides a buffer against unforeseen difficulties. It also provides organizational financial slack, which facilitates a necessary response to changing conditions and increases the willingness of a firm to innovate and change (Zahra 1991). Availability of financial capital is difficult for Russia's small enterprises, as the banking system is not supportive of small businesses. This finding, relating to financial resources, has an important policy implication. It indicates that efforts should be made to provide a better mechanism for entrepreneurs to obtain loans.

The second hypothesis assumes that firms' organizational capital, including firms' climate, strength of the management team, and strategic planning, is positively related to firms' EO. This hypothesis was also supported, indicating a significant association between organizational capital and firm EO. Even though formal planning may not be a main priority for small business, the management team and the firm's climate seem to be important factors for achieving high entrepreneurial orientation for a firm. This finding has an important implication for practitioners. In Russia, where entrepreneurship is a relatively new phenomenon, organizational culture and climate are often perceived as relatively unimportant. From a review of previous studies on Russian entrepreneurs, it appears that the organizational culture and mindset of Russian entrepreneurs is often quite different from that of Western entrepreneurs (Puffer and McCarthy 2001). However, the present study reveals that the strength of the management team is important to achieve proactive and innovative firm strategy.

The third hypothesis relates to the impact of social capital on firms' EO. Social capital, including the importance and breadth of social networks at the owner and management level, is assumed to be positively associated with firm performance. Although the hypothesis was derived based on Western literature, it is natural to consider networking as an important factor in the Russian context when taking into account the well known phenomenon of 'blat' relationships (Michailova and Worn 2003).

This hypothesis was also confirmed and indicated significant association between social capital and firm EO.

Findings Relating to the Self-efficacy Model

The research question relating to the self-efficacy research model assumes that firms controlled by individuals citing high levels of self-efficacy will report superior firm EO. This should especially be the case for small businesses, where the personality of an entrepreneur might have a direct impact on the firm's strategic orientation. In the present study, it was also important to control for the role of respondents: either owner and manager, or just manager. However, this does not seem to impact upon relationships between self-efficacy factors and EO. The findings revealed that opportunity, risk and financial competencies were significantly related to firm EO, supporting hypotheses 4, 5 and 6.

Prior studies undertaken in Western economies show a positive association between resource-acquisition, self-efficacy factors and EO (Brown and Kirchhoff 1997). In the present study, the self-perceived ability to acquire necessary financial resources was positively related to the firm's EO at the 0.01 level of significance, confirming that resource-acquisition ability is an important factor in building entrepreneurial strategy to Russian entrepreneurs. In addition, this study also takes into consideration other types of self-efficacy, extending the knowledge about the factors that might be important in building appropriate theory explaining the antecedents of EO. Previous studies showed that different types of self-efficacy are important for the intentions to start a business and can be useful at the start-up stages (Anna et al. 2000; Kickul and Krueger 2004). In the present study, it was found that the ability to recognize and develop market opportunities was positively associated with EO at the 0.001 level. Another type of self-efficacy that was found to be associated with EO is an ability to deal with uncertainty and risk. The association between the ability to appraise opportunities and undertake risky behaviour on one hand and the firm's entrepreneurial way of strategy building on the other hand seems natural, since entrepreneurship is often equalled with opportunity search and implementation (Brown et al. 2001; Stevenson 1983).

The self-efficacy variables together explain about 18 per cent of the variance in firm EO. According to Cohen (1977), this can be regarded as a moderately large share of variance. This suggests that the present study makes an incremental but still important theoretical contribution by confirming that entrepreneurial self-efficacy is also an important determinant of firms' entrepreneurial orientation. At the same time, the

results are weaker than expected, which could be for similar reasons as for the resource constructs. It also could be that operationalization of opportunity and risk self-efficacy were developed to study intentions to start a business rather than entrepreneurial orientation. Therefore, the better operationalization of a self-efficacy construct might provide higher explanation power.

These findings have an important practical implication. Self-efficacy can be encouraged through educational efforts, which can be seen to be a reasonable instrument for both practitioners and policy makers to stimulate sustainable development among small businesses.

CONCLUSIONS

Theoretical Challenges and Contributions

As outlined in the introduction, there are still gaps in the knowledge base regarding the factors associated with the entrepreneurial orientation of a firm. A theoretical contribution can imply adding new elements or relationships, providing new or improved explanations as to why these relationships occur, widening or narrowing the boundaries in which the theory is applicable (Whetten 1989). While entrepreneurial orientation is often considered as an important factor contributing to a firm's development and performance, relatively little is known about the factors that can potentially enhance the entrepreneurial orientation of a firm.

The results of the present study are influenced by the research design and the methodology employed. Most methodological choices are associated with both advantages and disadvantages, which the researcher must address in choosing the best possible way to answer the research questions in the face of available resources. This study is quantitative, building a theoretical model based on the knowledge available and then testing it with empirical data. While this approach is suitable in many situations, it also has some disadvantages. The literature within the entrepreneurship field is mainly based on studies performed in a Western context. Although an inductive pilot study revealed the importance of the factors previously outlined in the Western literature, it did not reveal any context-specific factors, whereas an in-depth, inductive approach could provide different results, although this task was beyond the scope of the present study. Further research is warranted in order to look more closely at the context of dependent factors.

The present study offers a framework to study antecedents of

entrepreneurial orientation, which may represent the theoretical contribution of the study. In this framework, some elements have previously been tested on Western samples, such as the relationships between financial capital and firm EO and between the resource acquisition ability of the owner-manager and firm EO. The value of replication is often undervalued, despite the fact that various authors have called for studies that could be replicated (Hubbard and Ryan 2000; Sawyer and Peter 1983). However, the majority of the studies on entrepreneurship have been conducted in advanced economies. Testing Western theories in a transitional context provides an opportunity to confirm whether factors assumed to be important for EO in West are equally important in other contexts.

Secondly, this research extends Covin and Slevin's (1991) conceptualization of firm-level entrepreneurial orientation. While other external and internal antecedents of entrepreneurial orientation have been examined, this is the first time that types of resources other than financial and knowledge-based resources have been assessed. The present study shows the importance of the organizational and social capital to firm EO. If one assumes that EO leads to stronger performance and growth of the firm, this means that a firm's resources might contribute both directly and indirectly to that firm's sustainability.

Thirdly, this study extends Brown and Kirchhoff's (1997) research on the antecedents of the EO at the personal level. Brown and Kirchhoff (1997) found a weak association between resource-acquisition self-efficacy and a firm's EO. More recent research showed that self-efficacy is important for the intentions to start a business and can be useful at the start-up stages (Anna et al. 2000; Kickul and Krueger 2004). The present study makes an important theoretical contribution by calling attention to the association between opportunity identification and risk-taking self-efficacy and entrepreneurial orientation.

Methodological Challenges and Contributions

The present study has also made a number of methodological contributions. To carry out this research, main decision makers in small enterprises in St Petersburg, Russia, were contacted at one point in time. Research on entrepreneurship in Russia is very limited. There is an absence of studies employing rigorous theoretical approaches and representative samples. The present study applies a thorough theoretically based platform to study firm EO in the context of a transitional economy using a representative sample of entrepreneurs from a single city. The trustworthiness of the data collected and analysed was considered. Although it was difficult to obtain

the data, this was overcome with the help of students and their personal connections. Such a data collection technique is novel, and can be applied for future research in transitional countries where trust is an issue and the accessibility of respondents is a main concern.

The concerns of external validity are whether the results of the study can be generalized beyond the specific research context (Bryman and Bell 2003). To assess the external validity of the study, a chi-square test was conducted to detect any differences between the valid sample and the population. The valid sample of respondents was not markedly different from the population at the 0.05 level of significance. On the basis of this criterion, it can be argued that the generalizability (also known as the external validity) of the valid sample was established.

In the present study, valid and reliable composite measures were identified using principal component analysis and both convergent and discriminating validity issues were considered. The reliability of all composite measures was assessed. The results indicate high reliability of the measures employed in the study. It can be concluded that representative, trustworthy data was collected and that reliable measures were created for the present study. This allows the applying of the composite measures created and tested in the context of St Petersburg to future studies of transitional economies.

A potential limitation relates to how the evidence was gathered from a single respondent, the main decision maker, but not necessary the owner and founder of the firm. This could affect the results, especially those relating to the individual-level variables. Future research should exclude employees and concentrate solely on the owner-founders. In addition, a single respondent does not allow for an inter-reliability test. While the time and cost constraint in the present study did not allow for collecting data from multiple respondents in each firm, this opportunity should be considered in future research.

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APPENDIX: INTERVIEW GUIDE (ENGLISH VERSION)

Interview Guide

1. Present yourself and describe your role in this firm, please.
2. Can you, please, speak about the firm – what product/services you produce/offer, who are the clients, what is your market, what is the structure of the firm and who are the employees?
3. How was the firm established? How did the business-idea appear, and what was the main motivational factor?
4. What difficulties did you encounter during the creation stages of this business?
5. How would you evaluate the firm today (excellent performance, good performance, average performance, poor performance)?
6. What are the main difficulties the firm faces today?
7. What are the current plans for the future (growth opportunities, motivation to grow the business)?
8. Please name the three most important 'success' factors for your business (discussion).

13. Entrepreneurial orientation and performance in micro-sized firms: comparing agricultural and non-agricultural firms

Jorunn Grande

INTRODUCTION

This study investigates the importance of entrepreneurial orientation (EO) and firm specific resources to the performance of micro-sized firms.[1] Entrepreneurial orientation has emerged as an important concept for describing and measuring entrepreneurial efforts and attitudes in firms (Covin and Slevin 1989; Green et al. 2008; Lumpkin and Dess 1996). The EO concept looks at the firm's tendency to innovate, take on risk and be proactive in developing and marketing the firm. Substantial research within this area suggests that firms with a greater EO tend to perform better in terms of sales growth, new products, and so on (Madsen 2007; Wiklund 1999; Wiklund and Shepherd 2005).

However, some studies have questioned this relationship (Hart 1992; Smart and Conant 1994) suggesting that embracing EO activities may not be inherently beneficial to all firms. As stated in the early work of Lumpkin and Dess (1996) and Covin and Slevin (1989), organizational and environmental factors are likely to have a significant influence on this relationship. As Gartner (1985, p. 697) explains: 'entrepreneurs and their firms vary widely; the actions they take or do not take and the environments they operate in and respond to are equally diverse – and all these elements form complex and unique combinations in the creation of each new venture'. This means that both internal and external contexts within which the firms operate are likely to be of great importance to the relationship between EO and performance.

In their important conceptual work, Lumpkin and Dess (1996) addressed four environmental factors that are likely to influence this relationship, namely, dynamism, munificence, complexity and industry characteristics.

However, so far most of the research on the influence of environmental context on the EO–performance relationship has been on market dynamism and hostility (Lumpkin and Dess 2001; Moreno and Casillas 2008; Wiklund and Shepherd 2005; Zahra and Covin 1995). Empirical studies addressing specific industry contexts seem to be scarce. Also research on micro-sized firms seems to be lacking. Most firms start out as small businesses with a few, if any, employees, and many firms also remain small when they mature. In Norway, as much as 89 per cent of firms consist of fewer than ten employees (Statistics Norway 2009a). As a result, the effect of EO in these circumstances should be of great importance for theory development, practice and policy makers. Earlier studies also stress that EO needs time to pay back to the firm (Madsen 2007; Wiklund 1999), arguing that more longitudinal studies are needed.

Earlier research suggests that effects of EO may vary due to the internal resources of the firm (Wiklund and Shepherd 2005). Internal firm resources are the prime attention in the resource-based view (RBV), which argues that firms need to possess unique resources in order to generate superior competitive advantages. It conceptualizes the firm as a bundle of resources, where different types of resources vary in the level of importance for generating value added to the firm (Barney 1991; Priem and Butler 2001). The main postulate is that firms need to possess valuable, rare and inimitable resources, as well as organizational resources to gain performance benefits. In this setting entrepreneurial attitudes and activities will be an important supplement enabling firms to explore and reconfigure resources to form this unique resource bundle.

To add knowledge about these issues a longitudinal study of micro-sized firms comparing two business contexts are performed. The following research questions are put forward:

- How does the EO pattern differ between firms in an agricultural and a non-agricultural firm context?
- What is the relationship between EO, firm specific resources and performance in the two firm contexts?

THEORETICAL PERSPECTIVES

Entrepreneurial Efforts within Existing Firms

Research within corporate entrepreneurship suggests that existing firms are likely to benefit from having internal environments that stimulate creativity and autonomy to pursue ideas and opportunities (Zahra and Covin

1995). Through better entrepreneurial efforts and skills firms may utilize their resources more efficiently by discovering alternative uses of possessed resources and increase their awareness towards new opportunities in the environment (Alvarez and Busenitz 2001). Owing to the possible positive influence on renewal and performance in existing firms, entrepreneurial efforts in an organizational setting have thus received increased attention among scholars in the past decades (Covin and Slevin 1989; Lumpkin and Dess 1996; Miller 1983; Wiklund 1999; Wiklund and Shepherd 2003, 2005). In this setting entrepreneurial orientation (EO) has emerged as an important concept and device for measuring and discussing the effect of entrepreneurial efforts within existing firms.

Literature defines EO as a firm-level phenomenon (Lumpkin and Dess 1996), often described as the mindset of firms involved in the pursuit of new ventures (Rauch et al. 2004). It is used to characterize a set of processes inside existing firms that include a variety of activities related to identification of new opportunities and subsequent investments in the resource base in firms (Alvarez and Busenitz 2001). The main assumption behind the EO concept is that it is a behavioural phenomenon and that all firms fall along a conceptual continuum that ranges from highly conservative to highly entrepreneurial (Barringer and Bluedorn 1999). Entrepreneurial firms are described as risk taking, innovative and proactive, whereas more conservative firms are explained to be risk averse, less innovative and typically adopt a 'wait and see posture' (Barringer and Bluedorn 1999).

Earlier studies have mainly defined EO to consist of three (Covin and Slevin 1989; Madsen 2007; Wiklund 1999) to five (Hughes and Morgan 2007; Lumpkin and Dess 1996) dimensions that might vary independently of each other. These dimensions are: (1) a willingness to innovate; (2) a willingness to take on risks; (3) a proactiveness towards market opportunities; (4) a tendency to act aggressively towards competitors; and (5) a propensity to act autonomously (Lumpkin and Dess 1996). Several studies measuring the effect of EO seem, however, to concentrate on innovativeness, proactiveness and risk-taking (Madsen 2007; Wiklund and Shepherd 2003, 2005).

A firm's willingness to innovate thus captures the tendency to depart from established practices and technologies by embracing and supporting creativity and experimentation, technological leadership, novelty and research and development (R&D) in the development of products, services and processes. The risk dimension reflects the firm's acceptance of uncertainty and risk-related activities and is typically characterized by resource commitment to uncertain outcomes and activities. Finally, the proactive dimension is related to a forward-looking perspective where companies actively seek to anticipate opportunities to develop and introduce new

products in the market to obtain first mover advantages and shape the direction of the environment.

Entrepreneurial Orientation, Performance and Context

The predominant evidence is that firms with a high EO score often show better performance than firms with a lower score (Covin and Slevin 1991; Keh et al. 2007; Madsen 2007; Wiklund 1999; Wiklund and Shepherd 2003, 2005). However, this is disputed in some studies (Hart 1992; Smart and Conant 1994), indicating that the relationship between EO and performance is contingent on environmental and/or organizational factors (Covin and Slevin 1989; Lumpkin and Dess 1996, 2001). For instance, Covin and Slevin (1989) found that firms in hostile environments benefited from an entrepreneurial strategy, while firms in benign environments had more gain from adopting a conservative strategy. Here they describe conservative firms as typically displaying a management style that is more risk averse, non-innovative and reactive instead of proactive (Covin and Slevin 1989). This is also supported by Wiklund and Shepherd (2005), who found that businesses facing unpredictable customers, competitors or high rates of industry innovation had additional benefits from their entrepreneurial efforts compared with firms in more benign environments. However, their overall conclusion was that business performance in all investigated (small) firms increased with EO, but at a faster rate for firms characterized by dynamic environments.

Both the magnitude and the effect of entrepreneurial efforts might be different in a micro-sized firm context and to firms in an agricultural industry setting. For instance in agricultural firms, regulations may limit the size of certain operations, the type of productions and the availability of land for new entrants (Knutsen 2008), and in this way reduce entrepreneurial opportunities and discourage initiatives. Other economic policy schemes like target prices, subsidies, and tariffs may protect farmers from too harsh a competition (Knutsen 2008), such that too much innovativeness, risk-taking and proactiveness is a waste of money. Regulation has also inflicted on the market signal between consumer and producer, such that the producer may be less exposed to competitive forces from the market. This implies that such firms are likely to be less trained in handling change compared to firms operating in other sectors and less regulated environments (Alsos and Carter 2006). Owing to industry context, agricultural firms are therefore expected to behave more conservatively than other micro-sized firms. Hence, the following hypothesis is proposed:

Hypothesis 1: Firms in an agricultural industry context have a lower EO compared to other micro-sized firms.

By traditionally being more conservative and belonging to a regulated industry, innovative and risk-taking agricultural firms may put themselves in positions where outcomes of their actions might be uncertain (Green et al. 2008). As noted, lack of experience of such situations might reduce the chance of success. However, in periods of deregulation, as seen in agriculture in recent years, being more proactive, innovative and willing to take risk might be the only way of surviving. Since deregulation also means increased competition agricultural firms might be outperformed by others if they take on too conservative attitudes. The benefits of a higher EO might counterbalance the effects of regulation and lack of experience such that agricultural firms posing a relatively high EO will be rewarded, at least in the long run. Thus, owing to the potential benefits of possessing a higher EO, it is likely that both agricultural and other micro-sized firms will benefit from a relatively high EO. It is also expected that an increase in EO over time will give additional benefits to both firm contexts. By increasing their alertness and proactivity towards opportunities in the business environment they will counterbalance the possible negative effects of taking on too high risks. The following hypotheses are thus put forward:

Hypothesis 2:
(a) Entrepreneurial orientation in micro-sized firms has a positive influence on long-run performance.
(b) Entrepreneurial orientation in agricultural firms has a positive influence on long-run performance.

Hypothesis 3:
(a) An increase in EO in micro-sized firms has a positive influence on subsequent performance.
(b) An increase in EO in agricultural firms has a positive influence on subsequent performance.

Firm Resources: the Resource-based View

The organization and acquisition of resources is a central element in starting a new business or new venture (Aldrich 1999). In parallel, Alsos et al. (2003) describe resource-exploiting entrepreneurs as those that make the most out of their unique firm resources in order to create new economic activity. In addition to the entrepreneurial idea itself, the nature and success of the new venture will thus be influenced by the existing resource base in the firm. However, entrepreneurial efforts in firms often imply that resources are arranged in new ways to create new business opportunities

and use of resources. Recent research in strategic management also shows that critical elements for strategic change and creation of a sustained competitive advantage often are found in the resource configuration inside the firm (Borch et al. 1999; Rumelt 1991).

The resource-based view of the firm has thus emerged as an important perspective and instrument for finding and evaluating possible business opportunities and resource needs in firms (Barney 2002; Penrose 1959). It conceptualizes the firm as a bundle of resources, where different types of resources vary in their level of importance for generating added value to the firm. According to the RBV, the firm's ability to build new competitive advantages and explore new markets depends on its available resources and its ability to develop these resources (Barney 1991). It argues that firms with valuable, rare and inimitable resources have the potential to gain superior performance (Barney 1991).

The RBV thus emphasizes the significance of a firm's unique resources as a source of competitive advantage. Awareness and identification of these unique resources often depend on the knowledge and competence of how resources can be used.[2] But as Penrose (1959) also explained, resources are not enough in themselves; potential services have to be applied to exploit these resources. This knowledge might be tied to the firm's unique history, causal ambiguity (the inability of other firms to fully understand what they are doing), tacit knowledge assets and/or the social complexity within the organization which can make it hard to copy (Dollinger 1999; Rumelt 1984). The firm's bundling of resources might thus shape its advantages through the portfolio of difficult-to-trade assets (Alvarez and Busenitz 2001; Teece et al. 1997). In general it is therefore possible to claim that the firm must possess a sort of unique competence or knowledge to fulfil the assumptions of the RBV. Thus firms may not achieve increased profits owing to better resources alone, but rather through their unique competence enabling better use of these resources (Newbert 2007).

In competing with larger firms, micro-sized firms need to find their niches and differentiate their products. For locating niches and/or producing differentiated products, small firms are likely to be particularly dependent on possessing and using resources and competence that are not easily copied by others. This indicates that firms may not achieve larger profits based on better resources alone, but rather through their unique competence in making use of these resources (Newbert 2007). As a result, the following hypothesis is suggested:

Hypothesis 4:

(a) Unique competence in micro-sized firms has a positive influence on performance.

(b) Unique competence in agricultural firms has a positive influence on performance.

Micro-sized firms may have both resource disadvantages and advantages compared with large firms. Resources and access to them often vary between different business contexts, such that a specific resource might be more valuable to one type of industry context compared to others. For example, external networks might be considered of particular importance to micro-sized firms. Small firms may have limited resources for own information search, R&D, accessing markets and are thus likely to benefit from developing networks to level out these disadvantages. Studies indicate that appropriate networks might keep firms updated on product development, new technology, consumer trends, market development, etc. (George et al. 2001). Valuable information acquired through networks can be used to evaluate the existing resource base related to environmental conditions and customer needs (Sirmon et al. 2007). Networks might also be an important tool to build strategic alliances especially to small firms by giving better access to markets and raw materials (Gulati et al. 2000). Based on the above arguments the following hypothesis is proposed:

Hypothesis 5:
(a) External network in micro-sized firms has a positive influence on performance.
(b) External network in agricultural firms has a positive influence on performance.

METHOD

In order to study the research questions, a sample of Norwegian firms participating in a regional innovation programme offered by Innovation Norway (IN) in 2002 was constructed (Brastad et al. 2003; Madsen and Brastad 2006). Innovation Norway is a governmental agency which aims to enhance innovation in Norwegian trade and industry through networks, competence and funding. It is prepared to take on greater risk than other funding institutions and offers advisory service and funding to firms in the early stages of development projects. By applying for, and participating in, this programme the firms have initiated some type of development project. This might be connected to improving/expanding their current business, new product development, market analyses, integrating new knowledge or similar applications. Firms receiving support from this programme are therefore likely to be more oriented towards innovation and development

of their firm than other firms. Since both agricultural and non-agricultural firms are included in this programme, access to comparable data from both contexts is facilitated. This Norwegian setting should therefore be especially suitable for studying the long-term effects of entrepreneurial activities and attitudes.

The Agricultural Industry Context

The agricultural sector is often the most regulated industry in many nations due to its economic and social importance. This is seen in the USA (Schneider 2005), in Norway (Knutsen 2008) and in other European countries (European Commission 2009). Important features of the agricultural sector is the nature of the production of food for human consumption, its extensive use of natural resources and the magnitude of economic transactions it represents to many nations (Hamilton 1990). Normally, industries are regulated to thwart the exercise of monopoly power; in contrast, agriculture is regulated in order to mitigate the harsh effects of competition (Schneider 2005). Economic regulation of this sector is therefore often justified in order to maintain adequate food supplies and ensure livelihood in rural regions. In Norway, as in many countries, regulation of this sector is imposed through legislation and economic policy incentives (Knutsen 2008). Regulation may limit the size of certain operations, type of productions and availability of land for new entrants. Other economic policy schemes include target prices, subsidies, tariffs and production quotas (European Commission 2009; Knutsen 2008).

Restructuring of this sector due to changes in national and international policies, has led to greater demand for entrepreneurial activities among farm businesses (Alsos et al. 2003). A great pressure on opening markets from the World Trade Organization (WTO) has induced policy reforms within the European Union through the Common Agricultural Policy (CAP) and in many other nations such as Norway (DEFRA 2005; European Commission 2009). These reforms have reduced public support and increased competition in the agricultural sector, endangering potential profits to its firms. Many farm business owners are therefore forced to look for new business opportunities to sustain sufficient income at their farm (Alsos et al. 2003; Vesala et al. 2007).

Profiles of the Two Firm Groups

Firms employing less than ten people were selected to facilitate comparison between groups in an agricultural context and a general business context, since Norwegian farm firms rarely employ more than ten people.

The agricultural firms represent different types of traditional agricultural productions and new types of ventures related to farming and a farm property (approximately a 60/40 relationship). Data were collected using a mail questionnaire followed by a telephone interview directed towards the businesses manager or owner. Data were first gathered in 2003 (510 responses) and through a follow-up study in 2006 (486 responses). In total there were 306 responses giving data for both years and out of these 258 firms had answered all questions.

Non-agricultural firms represent all types of companies from several sectors outside agriculture, including manufacturing, services, fisheries, trade, hotels and restaurants. The size of non-agricultural firms averaged 2.9 man-years in employees, whereas the agricultural firms engaged on average 1.8 man-years. The average work experience for firm managers was close to 22 years for both contexts. There was, however, a larger share of younger firms among non-agricultural firms compared to the agricultural firm group. As much as 67 per cent of non-agricultural firms were established during the past five years, compared with 44 per cent for the agricultural firms. Entrepreneurs' educational level differed between the two contexts: in total 63 per cent of the owners in the general firm group had university education compared to 22 per cent of those in the agricultural firm group.

Variables and Measures

Information about number of items, measurement method and mean score for the variables used in the analysis is presented in Table 13.1 and Table 13.2.

Dependent variables

In order to investigate the longitudinal performance effects of resources and EO, business performance in 2006 is used as dependent variable in the regression analysis. Previous studies have used many different measures of firm performance (Chandler and Hanks 1994). However, when investigating the EO–performance relationship Lumpkin and Dess (1996) argue that it is essential to recognize the multidimensional nature of the performance construct. They explain that 'entrepreneurial activity or processes may at time lead to favourable outcomes to one performance dimension and unfavourable outcomes on a different performance dimension' (Lumpkin and Dess 1996, p. 153). In accordance with their recommendation, a multiple performance measure was used. Performance is therefore measured through several items covering the firm's actual performance compared with its competitors in the same sector. These items are 'better market position', 'larger market share', 'higher sales growth', 'higher employment

Table 13.1 Descriptive statistics of variables in the two firm groups

	No. of items	Type of measure	Agri		Non-agri		Anova
			N	Mean Score	N	Mean Score	F-value
Performance 2003	Five	Summated	127	2.56	149	2.69	0.73
Performance 2006	Five	Summated	135	2.56	154	2.80	1.17
Firm size	Single	Man-years	142	1.83	164	2.87	21.54**
Unique competence	Single	Likert 1-7	141	2.90	163	4.18	31.84**
External network	Four	Summated	138	3.82	160	5.15	60.50**
EO 2003	Six	Summated	142	3.11	164	4.74	115.37**
EO 2006	Six	Summated	142	2.57	164	4.13	93.75**
EO change (from 2003 to 2006)	Six	Summated	142	−0.55	164	−0.60	0.14

Note: ** Significant at 0.01 level.

growth' and 'better financial results'. Each item was fitted to a one-sided 7-point Likert scale, where the response 1 represented 'strongly disagree' and response 7 represented 'strongly agree'. By use of principal component analysis (PCA) these five items appeared to represent a unidimensional construct for both firm contexts. The Cronbach's alphas for these were 0.91 and 0.89 respectively for agricultural and non-agricultural firms. The performance measures were then constructed by using the average of the five items above.

Independent variables

All resource variables entered into the model represent 2003, which is the first year after support from IN was received. As measure for EO the 2003 score and the change in EO score in the period from 2003 to 2006 were used. The measurement scale for the EO variable is based on the operationalization of the concept by Covin and Slevin (1989) and a further development of this scale by Madsen (2007). As explained in the theory review, the EO concept is often described as consisting of three or five dimensions, although in analyses these are often combined into one EO factor (for example, Wiklund 1999). Since the purpose in this study is to measure the overall effect of EO on firm performance, EO was chosen

Table 13.2 Comparing EO in agricultural and non-agricultural firms

	No. of items	Type of measure	Agri N = 142 Mean	Non-agri N = 164 Mean	Anova F-value F-test
EO 2003 (First year)	Six	Summated	3.11	4.74	115.37**
• We accept high risk	–	Likert 1-7	2.68	3.52	18.02**
• We aim at being first out with technological development in our business line	–	Likert 1-7	2.67	4.43	57.67**
• We use resources to explore market opportunities	–	Likert 1-7	3.35	5.07	68.31**
• We emphasize continuous development of our business	–	Likert 1-7	4.25	5.48	40.49**
• We engage in product development	–	Likert 1-7	3.33	5.38	79.93**
• We emphasize being first to introduce new product/services	–	Likert 1-7	2.44	4.53	86.78**
EO 2006 (Three years later)	Six	Summated	2.57	4.13	93.75**
• We accept high risk	–	Likert 1-7	2.36	3.24	20.60**
• We aim at being first out with technological development in our business line	–	Likert 1-7	2.49	4.16	57.00**
• We use resources to explore market opportunities	–	Likert 1-7	2.94	4.39	45.20**
• We emphasize continuous development of our business	–	Likert 1-7	3.10	4.64	51.28**
• We engage in product development	–	Likert 1-7	2.39	4.22	67.49**
• We emphasize being first to introduce new product/services	–	Likert 1-7	2.15	4.16	84.71**

Note: ** Significant at 0.01 level.

to consist of the average score of six questions related to the firms' self-reported innovative behaviour, risk-taking propensity and proactiveness.

These items were fitted to a one-sided seven-point Likert scale, similar to the items in the performance variables. The analysis of the scale for EO 2006 gave Cronbach's alphas for agricultural firms of 0.87 and for non-agricultural firms 0.85. In 2003 this statistic was 0.80 for both firm groups. For external networking, a measure previously utilized by Borch et al. (1999) was used comprising an average score of the four items: 'use of manager's own networks', 'network as a knowledge-resource', 'use of networks to influence the environment' and 'use of employees' networks as an information source'. The four items conformed to a one-factor solution in a PCA, yielding Cronbachs's alphas at 0.82 for agricultural firms and at 0.86 for non-agricultural firms. Unique competence was used as a single item measure through the item: 'The firm has a competence which is difficult to copy.' This measure has previously been used by Madsen (2007), and includes the degree to which the firm possesses unique knowledge.

Control variables

Firm size and performance in 2003 were used as control variables. Smaller and younger firms are likely to face more challenges in exploiting upcoming opportunities due to a limited resource base (Stam and Elfring 2008). Even though all firms in this study employ fewer than ten people, the smallest firms in this group may possess fewer resources compared with firms with more employees. Especially for agricultural firms a high number of employees is likely to be related to the possession of large land properties. To measure firm size the respondents were asked how many people were working in the firm and approximate this to the corresponding number of full-time man-years. Performance 2003 was measured similarly to the dependent variable, that is, performance in 2006. By using performance 2003 as control variable the indirect effect of EO and resources on performance 2006 is neutralized. Since this is really a short-term effect on performance 2003 the long-term effect on resources and EO on performance should stand out more clearly. The scale for the items in the performance 2003 variable yielded Cronbach alphas at 0.86 for agricultural firms and 0.83 for non-agricultural firms.

RESULTS

The data were analysed using several steps. First the possible differences in EO and resources between the two firm groups were explored. Then

several regression models were run to test the hypotheses regarding the relationship between EO, resources and firm performance. Analysis of the mean and variance for the two groups indicates a significant difference in EO level between the two firm contexts, which gives support for hypothesis 1. As Table 13.2 shows, agricultural firms received a mean score at 3.11 (measured on a scale from 1 to 7) in 2003, whereas non-agricultural firms had a higher average score at 4.74. When measured three years later, there is also a significant difference between the two groups: agricultural firms now have an EO score of 2.57 compared to 4.13 for non-agricultural firms. Investigation of each individual item in the summated EO score shows that the two groups display significantly different means for all included items both in 2003 and in 2006. Agricultural firms thus score significantly lower on all dimensions included in the EO score, suggesting that they are less risk taking, less innovative and less proactive compared to enterprises belonging to a general firm context. These results then clearly support H1.

Tables 13.3 and 13.4 show the correlation between variables in each of the two firm groups. Both matrices show a significant relationship between several resource variables, performance and measures of EO. For both groups the variables unique competence, external network, EO 2003 and change in EO are positively related to the dependent variable, that is, performance 2006. The groups also show a similar relationship between several of the independent variables. However, differences can be found related to firm size, which seems to be positively related to performance 2006 in the agricultural firm group although no such relationship is found in the general firm group. There is also a significant relationship between change in EO and unique competence for agricultural firms, but not for non-agricultural firms. The diagnostics tests suggested by Hair et al. (1998) indicated that multicollinearity was not a serious problem in our current sample (all variance inflation factors (VIFs) were less than 2), indicating that multiple regression analyses could be used in the further investigation of relationships.

The regression analyses had two main purposes. The first was to investigate the general relationship between the performance of micro-sized firms and the hypothesized influential factors as discussed in the theoretical sections above. The second was to test the hypotheses regarding the existence of differences between agricultural firms and non-agricultural firms in terms of factors influencing performance. The analyses were performed in several steps and the results are shown in Table 13.5 and models 1 to 4b. Model 3 shows the results of the regression where all theoretically relevant right-hand side variables were included in one common model. This model indicates which of the variables significantly influences

Table 13.3 Means, standard deviations and correlations for quantitative measures, agricultural firms

Variables	Mean	S.D.	1	2	3	4	5	6	7
1 Performance 2003	2.57	1.30							
2 Performance 2006	2.61	1.50	.708**						
3 Firm size	1.83	1.61	.262**	.242**					
4 Unique competence	2.90	1.81	.463**	.422**	.072				
5 External network	3.82	1.61	.333**	.224*	−.083	.314**			
6 EO 2003	3.12	1.28	.547**	.411**	.056	.467**	.505**		
7 EO 2006	2.57	1.32	.603**	.649**	.119	.413**	.310**	.683**	
8 EO change	−0.55	1.03	.100	.331**	.089	−.050	−.228**	−.366**	.430**

Note: * Significant at 0.05 level; ** significant at 0.01 level.

Table 13.4 Means, standard deviations and correlations for quantitative measures, non-agricultural firms

Variables	Mean	S.D.	1	2	3	4	5	6	7
1 Performance 2003	2.70	1.26							
2 Performance 2006	2.80	1.46	.463**						
3 Firm size	2.87	2.44	.194*	.138					
4 Unique competence	4.18	2.11	.216**	.263**	.101				
5 External network	5.15	1.33	.155^{+}	.167*	−.174*	.178*			
6 EO 2003	4.74	1.34	.285**	.261**	.048	.526*	.402**		
7 EO 2006	4.14	1.48	.227**	.401**	.107	.322**	.215**	.493**	
8 EO change	−0.60	1.43	−.032	.166*	.066	−.161*	−.156*	−.429**	.575**

Note: $^{+}$ Significant at 0.1 level; * significant at 0.05 level; ** significant at 0.01 level.

Table 13.5 The relationship between firm resources, entrepreneurial orientation (EO) and performance (std beta coef. and sign. level) – dependent variable is performance in 2006

	Agri firms N = 120	Non-agri firms N = 138	Common model N = 258	Interaction effect model N = 258	Refined model 4 † N = 258
	Model 1	Model 2	Model 3	Model 4a	Model 4b
Control variables					
Performance 2003	.431**	.370**	.469**	.396**	.423**
Firm size	.090	.084	.032	.082	
Resources					
Unique competence	.178**	.107	.134*	.098	
External network	.010	.084	.016	.103	
EO					
EO 2003	.225**	.164	.139+	.173+	.282**
EO change	.352**	.296**	.289**	.247**	.263**
Interaction effects					
Unique competence × agriculture				.122	.211**
External network × agriculture				−.126	
EO 2003 × agriculture				.147	
EO change × agriculture				.131*	.118*
Agriculture (dummy)				.092	
Model fit					
R^2	.632	.312	.433	.466	.455
Adjusted R^2	.613	.280	.420	.443	.444
F-statistics	32.62**	9.96**	32.20**	19.69**	42.39**

Note: + Significant at 0.1 level; * significant at 0.05 level; ** significant at 0.01 level; † insignificant variables deleted from the model (backward method).

performance when the two contexts are treated as a uniform group. Model 3 reveals previous performance (2003) and change in EO during the period as significant variables in influencing subsequent performance. There is also a tendency ($p < 0.10$) of influence from EO 2003 on long-term performance.

Models 1 and 2 show the results of the regression when the two contexts are treated as separate groups. The models reveal that change in EO and previous performance (2003) has a significant positive influence on performance in both contexts. However, unique competence and EO 2003 appears to be significant in relation to performance only in the agricultural firm context. This indicates that there might be a structural difference in the pattern of influential factors in the two firm groups. An F-test based on comparing the residual sum of squares (RSS) from the common model (model 3) to that of the separate models (models 1 and 2) of the two groups, indicates that this is the case (Weisberg 1985). This test yields an F-value 2.34 and a corresponding p-value at 0.025. This indicates that two separate models explain significantly more of the variations in firm performance than a common firm model.

In addition to having different structural relationships, the further analysis also tested for a possible difference in explanatory power in the variables for the two firm groups. A set of interaction variables was computed and entered into a new model such that the effect of belonging to an agricultural firm context might be tested and shown in a single model. An indicator (dummy) variable for agricultural firms was therefore multiplied by each resource variable, EO 2003 and change in EO to form the relevant interaction variables. These interaction variables take the value of the original explanatory variable for agricultural firms, and zero otherwise. The results of including interaction variables in the analysis are shown in models 4a and 4b in Table 13.5. The expanded models indicate that change in EO has an even stronger positive impact on performance in agricultural firms compared to non-agricultural firms. This means that even if firms in both contexts benefit from increasing their EO, agricultural firms seem to benefit even more. By deleting insignificant variables through the backward regression method, model 4b reveals that unique competence is a significant influential factor for agricultural firms, but not for non-agricultural firms as previously indicated by models 1 and 2. It is also worth noting that EO 2003 comes out with higher significance level in the refined model, showing its importance to long-run performance for both firm groups. These results reveal that we fail to reject hypotheses 2a, 2b, 3a, 3b and 4b, although we reject hypotheses 4a, 5a and 5b.

DISCUSSION

Comparing EO in Agricultural and Non-agricultural Firms

By comparing EO in agricultural and non-agricultural firms it appears that on average, firms within the agricultural industry context possess more conservative entrepreneurial attitudes and behaviour than firms in a general business context. This means that they are more risk averse, less innovative and typically adopt a 'wait and see posture' as explained by Barringer and Bluedorn (1999).

This study thus supports earlier findings by Vesala and Peura (2003) on entrepreneurial identity which found that conventional farmers were not as entrepreneurial as other business owners. As discussed in the theory section there might be several reasons for this conservativeness. First, it is a likely effect of industry's regulation. This may yield fewer market opportunities and limit expansions compared to firms in less regulated sectors. Second, in Norway individual farmers have to a less extent been responsible for bringing their products to the final market themselves, since this task has been organized by large agricultural cooperatives (Alsos and Carter 2006). Prior research has also detected that farmers lack knowledge in several areas like product development and market orientation (Borch and Iveland 1997; Kvam et al. 2002). This means that the single firm owners within the agricultural industry may not be as market oriented and focused on product development as has been necessary for firm owners/managers belonging to a general firm context. Finally, the low EO score in this sector could be an expression for and result of the structural change and recession experienced in agriculture in Norway in the last two decades. In the period from 1999 to 2006 Norwegian agriculture had a drop out of 3.9 per cent of all farm firms every year (Statistics Norway 2009b).

It is also worth noting that the average EO score is reduced from the first to the second period for both business groups, indicating that entrepreneurial attitudes and actions are reduced in the years following their initial investments and start-up. This is somewhat unexpected but might indicate that EO varies along the lifetime of the firm and their investment projects, and that firms may go back to more conservative attitudes after the initial phase of their development project. They might be very enthusiastic and devote time to entrepreneurial activities around the start-up of a new project, but later become too occupied in the operation of the business on a daily basis.

The Relationship between EO, Resources and Business Performance

The result indicates that in both contexts firms are likely to be financially rewarded for taking on more agile entrepreneurial offensives. Thus the argument that firms having a higher EO than others are likely to achieve higher returns in the long run seems to be valid also for these two firm contexts. These findings thus support earlier studies that many firms may benefit from engaging in entrepreneurial activities (Covin and Slevin 1989; Madsen 2007; Wiklund 1999). More surprising, however, is that the analysis shows that agricultural firms are even more rewarded than non-agricultural firms from a higher EO. As expected they do follow a conservative strategy, but it is not expected that they benefit more than other micro-sized firms from being entrepreneurially oriented. Based on a regulated industry setting and their lack of competence related to marketing, such efforts were pre-supposed to be more challenging to agricultural firms compared with firms in a general business setting.

Nevertheless this study indicates that agricultural firms that are more innovative, proactive and risk-taking than their counterparts also get financial reward for these efforts. This suggests that agricultural firms have been able to avoid the restrictions from regulation and rather benefited from the opportunities offered by the agricultural setting. The results show further that firms within an agricultural industry context perceiving to have unique resources also get performance benefits from these. These findings thus support the RBV which claims that resources must be unique in order to sustain competitive advantage and performance in the long run (Dollinger 1999; Newbert 2007; Rumelt 1984).

This is however not the case for non-agricultural firms, since the results indicate no significant effect of possessing unique competence. Perhaps, their unique competence is not as unique as business owners perceive, that is, the perceived uniqueness might not be sufficiently rare, valuable or difficult to copy as prescribed by the RBV. This might indicate that it is easier to find and elicit real unique competence in terms of the RBV within the agricultural context compared to non-agricultural firms. It might also be argued that the competence attached to the farm setting like its relative location, history, buildings and adjacent landscape adds value and uniqueness products that are not easily copied by others. Owing to property rights (and type of properties) and legal entrance barriers this type of competence might be more valuable and easier to protect within the agricultural sector.

The analysis could not find any significant relationship between external network and long-run performance in any of the firm contexts. This indicates that the effect of networks is short-lived and that micro-firms in

general struggle to build appropriate networks that are beneficial for their business.

CONCLUSIONS

Previous studies indicate that the importance of EO and unique resources may depend on firm context, although hitherto little has been known about these relationships in micro-sized firms and in firms in the agricultural industry. Through an empirical investigation comparing these two firm contexts, the study adds to theory and practice through several findings.

First, the study indicates that agricultural firms are less entrepreneurially oriented (less innovative, less risk taking and less proactive) than other micro-sized firms. Investigations show that farm firms are more conservative in their actions and attitudes, suggesting that EO of firms might be suppressed in agriculture due to heavy regulation, traditions and strong competition in the food market.

Secondly, the study supports earlier findings related to the EO perspective in that firms possessing a high EO also get financially rewarded for this engagement in the long run. The findings point out that both agricultural firms and other micro-sized firms are likely to obtain long-term benefits from taking on more agile entrepreneurial attitudes and actions.

Thirdly, and more surprisingly, the findings suggest that firms within seemingly more constrained environmental contexts, as represented here by the agricultural industry, may have additional benefits from entrepreneurial actions. More specifically this study shows that agricultural firms, traditionally restricted in their opportunities by a heavily regulated market, mature industry and traditions, get even more benefits from engaging in entrepreneurial activities compared to their counterparts in other business sectors.

Finally, the study suggests that the benefits from possessing unique competence might depend on firm context. Whereas non-agricultural firms appear to receive little effect on long-term performance from possessing unique resources, agricultural firms seem to have significant benefits from possessing this type of resource. This shows that agricultural firms that are able to detect and unfold unique resources do get rewarded for it. The findings also suggest that in some business contexts unique competence may not be relevant or harder to find and thus reap benefits from.

These results suggest that policy makers and business owners should pay attention to the importance of entrepreneurial efforts and skills in order to increase the potential for value creation in micro-size firms.

Small firms often lack resources to engage in such efforts, thus policy makers should strive to motivate and support these business owners to engage in innovative and proactive steps. Rural policy makers should pay particular attention to their agricultural firms. Even though they might be conservative in their attitudes, these firms are likely to benefit from increased entrepreneurial efforts and skills. Building entrepreneurial skills may increase their awareness of possibilities and threats in the business environment and may also aid them in exploring their unique resources and competences.

This study has concentrated on the relationship between EO and performance, but says little about how the current resource situation might affect the firms' entrepreneurial actions and activities. However, it is suggested that more knowledge on how to build a stronger EO in these types of firms is needed, in developing future research. It should also be noted that a low score on EO in agricultural firms might be caused by the fact that the traditional EO construct does not grasp these efforts properly in an agricultural firm context. Business owners in this industry might be innovative and entrepreneurial in different ways than those that are covered by the traditional EO construct. In other words, their innovativeness might not be shown in number of new products and increased market shares. More knowledge on the validity and applicability of the EO construct within different business contexts should thus be of interest in future studies.

NOTES

1. Micro-sized firms are here defined as firms employing less than ten persons.
2. This is also an important aspect of the knowledge-based view (KBV), a recent extension of the RBV, which goes deeper into the differences and importance of firms' knowledge-based capabilities (Grant 1996).

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14. Entrepreneurship in urban and rural Switzerland: similar or worlds apart?

Heiko Bergmann and Daniel Baumgartner

RESEARCH BACKGROUND AND AIM OF THE ANALYSIS

Entrepreneurship research, either explicitly or implicitly, mainly deals with entrepreneurship in agglomerations or urban areas. There are a number of reasons why cities may be particularly conducive to entrepreneurship (Bosma et al. 2008). People on average have higher levels of education, and regional demand is higher and more diversified. Most new firms produce for a regional market, which explains why the development, structure and level of regional demand have a strong influence on the level of entrepreneurial activities (Reynolds et al. 1994). In most countries, there is a close relationship between the regional level of income and the population density, contributing to higher start-up rates in urban areas. Moreover, cultural and economic diversity is higher (Florida 2002) and 'innovation appears to be a large city phenomenon' (Feldman and Audretsch 1999, p. 415).

However, few studies investigate the characteristics and factors influencing start-ups in rural areas beside the agricultural sector (McElwee et al. 2005). Kalantaridis (2004) finds that entrepreneurial activities in selected European rural areas are clustered in different behaviour patterns strongly depending on the characteristics of entrepreneurs and a supportive local context within the region. Empirical studies further focus on the characteristics of entrepreneurs in rural areas (for example, Vaillant and Lafuente 2007), where special attention has been given to the entrepreneurial potential of immigrants into rural areas (Gülümser et al. 2008; Kalantaridis and Bika 2006). Other studies explore the role of the socio-institutional 'milieu' that rural entrepreneurs interact with (for example, Meccheri and Pelloni 2006; Stathopoulou et al. 2004; Vaillant and Lafuente 2007). Agglomeration areas, however, generally seem to offer a more favourable entrepreneurial milieu.

While it may be true that agglomerations are the focal point of entrepreneurship, there is also a growing awareness that entrepreneurship is a vital ingredient for rural development. In most developed countries, agriculture is no longer the backbone of rural economies. The OECD (2006) has included entrepreneurship and endogenous economic growth as a main focus in its *New Rural Paradigm*. The Swiss Secretariat for Economic Affairs (SECO) even goes a step further. In its report on the new law on regional policy in Switzerland, the stimulation of entrepreneurship is at the top of a number of policy measures that should lead to stronger endogenous economic development in the non-urban areas of the country. The definition of entrepreneurial behaviour in these areas as 'the willingness and the ability to undertake something' (Expertenkommission 2003, p. 100), however, remains somehow unsatisfactory.

The general aim of this contribution is to broaden our understanding of entrepreneurship in rural areas in Switzerland. So far, determinants and characteristics of entrepreneurship have mostly been studied either in general or in agglomeration areas only. Our key interest is whether these determinants and characteristics also prevail in rural areas or if there are differences between urban and rural entrepreneurship in the case of Switzerland. In order to do so, we look at different phases of the entrepreneurial process and address the following three research questions. First, we aim to check for different attitudes towards entrepreneurial activities of individuals in urban and rural areas in Switzerland. Second, we aim to identify differences in the determinants to start a new business in urban and rural areas in Switzerland. Finally, we aim to compare the outcomes of the entrepreneurial process in terms of new firm characteristics in urban and rural areas in Switzerland.

The chapter is divided into six sections. After this introduction, the second section gives an overview of the literature and presents the conceptual framework underlying the analysis. The next section discusses data and methods used. The fourth section presents the results of our analysis, which are then discussed in the following section. The final section concludes and gives an outlook on further research on the topic.

FINDINGS FROM PREVIOUS STUDIES AND CONCEPTUAL FRAMEWORK

Spatial Patterns of Entrepreneurial Activity in Rural and Urban Areas

Most investigations of regional entrepreneurial activities find a positive relationship between population density and entrepreneurial activity.

Agglomerations usually have higher levels of entrepreneurial activity than rural areas (see Bergmann and Sternberg 2007; Fritsch and Falck 2007; Reynolds et al. 1994). However, the distinction between urban and rural areas in multivariate analyses, which are prevailing today, is somewhat unsatisfactory: if taken into account at all, the urban–rural difference is only treated as one variable. Papers on regional entrepreneurship variations usually investigate urban and rural areas in the same model while only taking account population density or a dummy variable for agglomerations in contrast to rural areas (Bergmann and Sternberg 2007; Naudé et al. 2008). Such an approach assumes that the basic processes and influencing factors are the same in both types of regions.

However, there is some evidence that the entrepreneurial process differs in urban and rural areas at some points, for example:

- Individual motivations for entrepreneurial activities: in rural areas independence is an important motivation for starting a business (Westhead and Wright 1999). It can be assumed that these businesses are less growth oriented than purely opportunity driven ventures, which are more prevalent in metropolitan areas (Bosma et al. 2008).
- Sectoral distribution of entrepreneurial activities: while agriculture-related businesses are more prevalent in rural settings, high-technology start-ups are rare (North and Smallbone 2000). Drawing on evidence from New Zealand, new firms in peripheral regions are relatively more often founded in manufacturing industry and less often in the business services sector (Tamásy and Le Heron 2008).
- Institutional and physical environment for entrepreneurial activities: potential entrepreneurs in rural areas may face higher transaction cost, for example, for venture capital due to physical distances and a lower quality of infrastructure, which limits their growth potential (Keeble 1993). Furthermore, the institutional framework that aims at supporting entrepreneurial activities in rural areas may not fit the needs of potential entrepreneurs (Meccheri and Pelloni 2006).

Thus, the general perception seems to be that start-ups – as a measure of entrepreneurial activity – are fewer in number in rural areas and have a lower growth potential, although there is also some contrasting evidence. Stam (2005), for example, does not find a general spatial pattern of fast-growing young firms ('gazelles') in the Netherlands. Regions with relatively high numbers of gazelles can be found in the highly urbanized areas as well as in accessible rural areas. However, gazelles are slightly

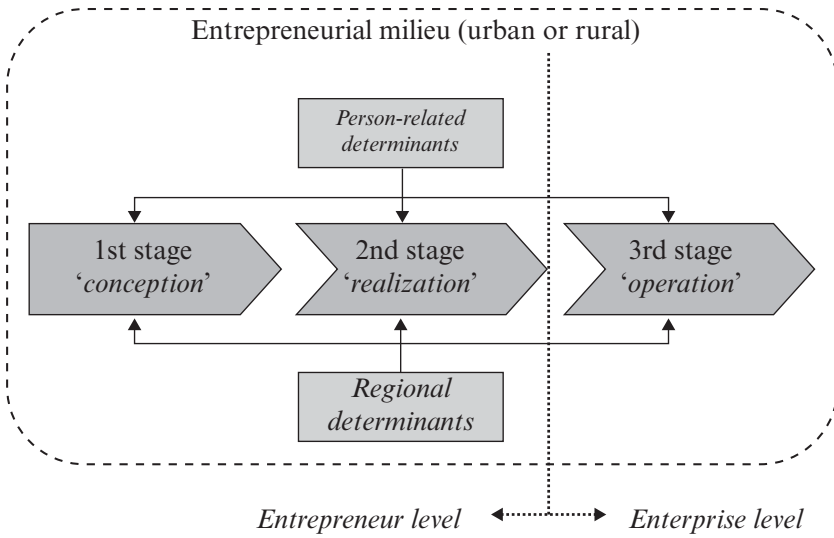
under-represented in remote rural areas. This result demonstrates that rural areas are not homogeneous.

Conceptual Framework

In order to assess entrepreneurial activities in rural and urban Switzerland we use the research framework for rural entrepreneurship proposed by Stathopoulou et al. (2004) as a starting point for our analysis. Entrepreneurship is conceptualized as a process consisting of three main stages:

- *First*, the conception stage: this phase includes the perception or the creation of an economic opportunity. Potential entrepreneurs have to discover new or evaluate existing business opportunities to start up a business venture (Shane 2003).
- *Second*, the realization stage: in this second stage, potential entrepreneurs engage in entrepreneurial activities and start to exploit the opportunities that have been discovered and evaluated in the first stage. In this stage, the often described entrepreneurial capacities – for example, risk-awareness (Knight 1921) or allocation and coordination of scare resources (Casson 2003) – have to unfold in order to successfully set up a new business venture.
- *Third*, the operation stage: the operation of the newly founded business venture is the last stage of the start-up process in the model. This stage reflects the results of a successful entrepreneurial process in the foregoing stages.

This separation into three different stages is similar to the separation used within the Global Entrepreneurship Monitor (GEM). The main difference is that in the GEM project the operation stage is further separated into a young business stage and an established business stage (Reynolds et al. 2005, p. 209f). Stathopoulou et al. (2004) state that the three stages are embedded in an 'entrepreneurial milieu'. Such a milieu is characterized by assets of the physical (for example, natural resources, landscape), the socio-institutional (for example, social capital, local and regional governance) and the economic (for example, business networks, infrastructure) environment in which entrepreneurs are embedded. This milieu separates rural from urban entrepreneurship and consequently leads to observable differences in the entrepreneurial process in rural and urban areas. Hence rural entrepreneurs are persons 'living in a rural location and the difference between them and an urban entrepreneur may be found in the effects of rurality on the entrepreneurial process', as Stathopoulou et al. (2004, p. 412) write.



Source: Adapted from Stathopoulou et al. (2004).

Figure 14.1 Entrepreneurship as a three-stage process

Starting from an understanding of entrepreneurship as a spatially embedded three-stage process, we add three further elements to our research framework. First, we assume that the understanding of the entrepreneurial milieu as presented by Stathopoulou et al. (2004) is also suitable for entrepreneurship in urban areas, even if the two environments may have different characteristics and may differ in their importance for successful entrepreneurial processes. Support for this assumption can by found in the 'innovative milieux' literature (Camagni 1995; Maillat 1998), which adapts the concept of the regional milieu for rural and urban regions similarly. Second, we consider the fact that the entrepreneurial process is not only shaped by the entrepreneurial milieu. It is also the individual decision to enter the entrepreneurial process that may differ between urban and rural entrepreneurial milieux. We generally distinguish between person-related determinants and regional determinants that affect the decision to enter the entrepreneurial process. Third, we define two main levels of analysis (see Figure 14.1). While in the first and the second part of the entrepreneurial process the entrepreneur is the suitable level of analysis, the level of the enterprise is our level of analysis for the third stage.

In all three stages, person-related and regional determinants influence

the entrepreneurial process. We briefly discuss these two groups of determinants in the following paragraphs.

Person-related Determinants of Entrepreneurial Activity

There has long been a debate in entrepreneurship research as to why some people start a business whereas others prefer to stay in paid employment. Labour economic approaches assume that the employment decision is mainly rational: people who intend to pursue gainful employment are faced with the choice of independent and dependent employment (Knight 1921, p. 271). The decision as to which of these two types of gainful employment is chosen is influenced by their relative attractiveness. This depends on the level of profit or expected pay, the current employment situation, other person-related characteristics and regional and national framework conditions.

The employment behaviour of women differs from that of men, and there are clear gender-specific differences in entrepreneurial activities. In most industrialized nations, including Switzerland, women's entrepreneurial propensity is lower than men's (Minitti et al. 2005). Women's working lives include more interruptions and part-time work, which is why women have less opportunity than men do to build up the professional expertise and experience necessary for launching a start-up. Traditional role models and the selection of vocational qualifications and academic studies also influence the entrepreneurial propensity of women (Carter 1997).

The relationship between the level of education and entrepreneurial propensity demonstrates contrasting tendencies. On the one hand, people with a high level of education tend to have better prospects on the labour market and higher earnings potential than less highly qualified people. According to this logic, entrepreneurial propensity should decline as the level of education rises. On the other hand, many self-employed activities require a high level of knowledge and skills. Empirical investigations show that the second relationship predominates and that a positive correlation between the level of education and entrepreneurial propensity can therefore be assumed (Davidsson and Honig 2003; Robinson and Sexton 1994).

Similar to the level of education, there are different tendencies in relation to age and entrepreneurial propensity. One the one hand, expertise, professional experience, self-confidence and the amount of capital available usually increase with age, which makes entrepreneurial activity more probable (Bates 1995). On the other hand, the level of professional and family embeddedness increases with age. Accordingly, the planning horizon for the remainder of the working life decreases, which would tend

to weigh against entrepreneurial activity. The impact of these two influences on the decision to launch a start-up can be analysed using life-cycle models (Schulz 1995, p. 114ff). Overall, the two contrasting influences demonstrate a reversed U-shaped relationship between age and entrepreneurial propensity, which is confirmed by most empirical studies. Initially, entrepreneurial propensity increases with age, reaches its peak between the ages of 35 and 40 approximately and then drops off towards the end of the working life (Bates 1995; Welter and Rosenbladt 1998). Former entrepreneurs or business angels can be expected to have the knowledge and the capability to launch a new start-up and it can therefore be assumed that they have a higher entrepreneurial propensity than people without such experience. Empirical studies support this conjecture (Davidsson and Honig 2003; Wagner 2003).

There are contradictory influences of unemployment on the level of entrepreneurial activity. The pressure to go into self-employment is greater for the unemployed than for those in employment. On the other hand, jobless people often do not have the necessary skills, experience and knowledge to do so. However, overall the positive influence of personal unemployment on the likelihood to become an entrepreneur seems to prevail (Ritsilä and Tervo 2002).

Regional Determinants of Entrepreneurial Activity

The general economic framework conditions in a region have a considerable influence on the level of regional entrepreneurial activities. Most new firms produce for a regional market, at least in the start-up phase, which explains why the development, structure and level of regional demand has a strong influence on the level of entrepreneurial activities. Therefore, empirical investigations often include such factors as the purchasing power or the density of a region's population.

Microeconomic decision models show that people become self-employed when they expect their self-employed activity to generate an adequate level of profit (Knight 1921). As regional demand increases, therefore, more firms are typically launched, as the high level of demand makes self-employed activities lucrative. In a comparison of studies in six European countries (Germany, France, Ireland, Italy, Sweden, the UK) and the USA, Reynolds et al. (1994, p. 449) conclude that an increase in demand makes the largest contribution to explaining regional differences in entrepreneurial activities: 'No process is more fundamental than reactions to increased demand for goods and services' (Reynolds et al. 1994, p. 446). Studies that are more recent, also demonstrate the influence of demand factors on the level of entrepreneurial activity (Armington and Acs 2002;

Bergmann and Sternberg 2007; Fritsch and Falck 2007). Besides the increase in regional demand, the absolute level of regional demand can exert an influence on entrepreneurial activities. Certain types of start-up, such as in the field of high-value person-related services, may only be viable in regions where many wealthy customers live.

To sum up, there are a number of personal and regional determinants that influence the propensity of individuals to enter the entrepreneurial process. Most of the evidence, however, is based on empirical studies that do not assume different effects in urban and rural areas. It is therefore difficult to make explicit assumptions about entrepreneurship in rural areas and to develop a specific 'rural entrepreneurship' model for Switzerland. Hence, our study is of an exploratory nature and tries to uncover differences in the entrepreneurial process between urban and rural areas.

DATA AND METHODS

Differences in entrepreneurship between urban and rural milieux may appear at two levels of analysis. In the first and the second stage of the entrepreneurial process, such differences may be related to the entrepreneur as the driving force of new venture creation. In the third stage of the entrepreneurial process, differences may occur in the characteristics of newly founded business ventures, that is, at the enterprise level. The following analysis is therefore based on two different data sources: data from the adult population survey of the Global Entrepreneurship Monitor (GEM) and the Swiss statistics of company demographics UDEMO.

The main source of data to investigate urban–rural differences in the conception and the realization stage of the entrepreneurial process is the adult population survey (APS) of the GEM for Switzerland from the years 2005 and 2007. The GEM is an international research project that aims to measure, compare and explain entrepreneurial activity in different countries of the world. Previous publications have demonstrated that GEM data, originally intended for international comparisons, can also be used for interregional analyses within a country, as we do in this contribution (Bergmann and Sternberg 2007; Rocha and Sternberg 2005). The general methodology of the GEM APS is described in Reynolds et al. (2005). The basic unit of analysis in the GEM project is the entrepreneur. The GEM APS surveys for Switzerland consist of random samples of 5456 (2005) and 2148 (2007) persons who were interviewed by telephone. The high numbers of interviewed persons allow a regional analysis of the GEM data for Switzerland. The availability of micro-level data is a major advantage of the GEM project since it makes it possible to combine individual

characteristics of the founder and the business with characteristics of the region where the person lives in a single analysis.

We use the Swiss statistics of company demographics UDEMO to investigate differences between urban and rural areas in the third stage of the entrepreneurial process. Unfortunately, this database only contains company-related characteristics and no information about the founder itself. The UDEMO database is based on the 'Betriebs- und Unternehmensregister' (plant and company register), which is administered by the Swiss Federal Statistical Office. It captures the names, business activities (that is, industry sector of the venture, classified according to NOGA[1] categories), legal structure, number of employees and spatial location of all plants and companies in Switzerland from 1999 to 2006 (Grossi 2005). All new entries which are commercially active and which work for at least 20 hours per week can be identified and are included in the UDEMO database as 'foundations ex nihilo'.

The data sources contain information about the place of residence of the entrepreneur (GEM) or the location of the newly founded enterprise (UDEMO). Both data samples hence can be split into an urban and a rural sample. We use the classification of Swiss statistics to distinguish between urban and rural areas in Switzerland (Schuler et al. 2004). Following this classification, rural areas are the 'residual' municipalities outside the core cities of agglomerations and the agglomeration municipalities according to the definition applied by the Swiss Federal Statistical Office (BfS) in 2000. This definition is mainly based on commuter statistics, population density and sectoral structure of the local economy (for more details see BfS 2005).

Table 14.1 shows the distribution of municipalities and population between urban and rural areas in Switzerland. Urban areas account for 73 per cent of the population but only 21 per cent of the total area of Switzerland. Rural areas, on the other hand, show an administratively fragmented picture since more than two-thirds of all Swiss municipalities are classified as rural. We use a combination of descriptive and analytical methods to address the research questions of this contribution. We use descriptive statistics based on GEM data to provide answers to the *first* research question about entrepreneurial attitudes in urban and rural Switzerland.

The *second* research question on the determinants of entrepreneurial activities in urban and rural areas is also investigated on the basis of the GEM dataset. The individual data from the telephone survey are combined with regional data from official statistics in order to assess personal related and regional determinants of entrepreneurial activity. Early-stage entrepreneurial activity, which was formerly known as the TEA-rate in the GEM-project, acts as dependent variable in the multivariate analyses.

Table 14.1 Urban and rural areas in Switzerland in 2000

	Number of municipalities	Percentage of municipalities	Share of population (in 1000s)	Share of population (%)	Share of area (absolute, km^2)	Share of area (%)
Urban Areas	979	34	5345	73	9006	21
Rural Areas	1917	66	1943	27	30982	79
Total	2896	100	7288	100	39988	100

Source: Achermann (2005).

Early-stage entrepreneurial activity acts as a proxy for the entrepreneurial activities in the second stage of the entrepreneurial process. This measure encompasses nascent entrepreneurs but also active firms that have been set up within the past three and a half years (Reynolds et al. 2005).[2] In order to identify potential differences between urban and rural areas we conduct separate logistic regression models for both types of areas and compare the results. On the basis of the discussion in the previous chapter we include the following person-related variables as dependent variables:

- gender;
- age (in years) and in squared form. The squared value of age (in years) is included as a separate variable in order to be able to identify non-linear relationships between age and start-up activity;
- educational attainment (in which three levels are distinguished: vocational training, grammar school, tertiary education) in contrast to people without such education;
- employment status, in terms of two binary variables (unemployed, homemaker) in contrast to people who are working;
- indicators of previous entrepreneurial activity, namely, former business ownership and business angel activity.

The following regional variables are included as dependent variables:

- self-employment rate: self-employed persons as percentage of all gainfully employed persons in the canton in 2000 (source: Swiss Federal statistical office);
- purchasing power in 1000 CHF per capita in the canton in 2005 (source: GfK-Group, Nuremberg).

The *third* research question is examined using a combination of the two databases. As a first step, we compare the outcomes of the entrepreneurial process in rural and urban Switzerland. In this regard, we analyse differences in start-up rates in urban and rural areas on the basis of the UDEMO and the GEM datasets. As a second step, we focus on the outcomes of the entrepreneurial process, by specifically looking at business sectors that can be assumed to have a high impact on regional development:

- Entrepreneurial activities *in sectors that apply new technologies*: entrepreneurship in business sectors that apply new technologies and procedures such as ICT services and in particular the high-technology sector positively influences regional development (Audretsch and Keilbach 2005). In order to identify sectors that apply new technologies within the UDEMO database we use the industry classification by Duemmler et al. (2004). The authors use the industry classification of the OECD (2001) in order to identify high-technology industries on the base of the NOGA classification. They further add some NOGA activities within financial services to the part of business activities that apply new technologies.
- Entrepreneurial activities in sectors with *high export orientation*: economic activities in sectors with high export orientation have been identified as an important driver for endogenous economic development especially in rural regions in Switzerland (Buser et al. 2005). Balmer et al. (2007) have identified industry sectors with high export orientation. The authors use a set of 24 indicators provided by official statistics combined with data internally generated by the Credit Suisse banking institute to identify the extent of export-orientation of 28 industry sectors.

As a last step, we compare results from the GEM project regarding the characteristics of new businesses in urban and rural business with the distribution of new business in sectors, which apply new technologies and have a high export orientation on the basis of the UDEMO dataset.

RESULTS

Conception Stage: Attitudes towards Entrepreneurship in Urban and Rural Areas

In order to analyse possible differences in the conception stage of the entrepreneurial process we analyse the attitudes of the general population

Table 14.2 Attitudes of the general population towards entrepreneurial activities in urban and rural areas in Switzerland

	Urban areas (n = 5338)	Rural areas (n = 2216)	Significance of difference (95% sign.)
In the next six months, there will be good opportunities for starting a business in the area where you live (% yes)	42.7%	35.8%	Yes
You know someone personally who started a business in the past 2 years (% yes)	44.2%	40.1%	No
In Switzerland, those successful at starting a new business have a high level of status and respect (% yes)	73.1%	72.6%	No

towards entrepreneurial activities in rural and urban areas. In this regard, we focus on the perception of opportunities, the acquaintance with other entrepreneurs and the perception of the social approval of entrepreneurial behaviour.

As the comparison in Table 14.2 shows, there are differences in the attitudes of the general population towards entrepreneurship between urban and rural areas. People in urban areas significantly more often see good opportunities for starting a business than people in rural areas. People in urban areas also more often know somebody personally who started a business in the past two years. However, this difference is not statistically significant. There is hardly any difference concerning the perception of the societal recognition of successful entrepreneurs. Overall, there are some attitude differences between urban and rural areas although these are smaller than one might have expected.

Realization Stage: Factors Influencing Entrepreneurship in Urban and Rural Areas

In this section, we look at the determinants of entrepreneurial activities in rural and urban areas. Table 14.3 summarizes the results for two logistic regression models calculated separately for urban and rural areas. The results for urban areas are generally in line with the findings from other studies, as discussed in the second section of this chapter. Considering

Table 14.3 Determinants of being an early-stage entrepreneur 2005/2007 (summarized results of logistic regressions)

	Model 1: urban area			Model 2: rural area		
	Coef. B	Wald stat.	Sign.	Coef. B	Wald stat.	Sign.
Person-related variables						
Gender (1 = male)	0.2954	5.36	*	0.6078	5.44	*
Age (in years)	0.1775	24.10	**	0.2113	10.04	**
Age squared	−0.0023	26.57	**	−0.0027	10.94	**
Combined signific. of two age variables[a]			**			**
Vocational training (1 = yes)	0.8978	8.67	**	0.5826	1.54	
Grammar school (1 = yes)	0.9839	7.89	**	1.6122	9.28	**
Tertiary education (1 = yes)	1.2715	17.41	**	0.9923	4.25	*
Unemployed (1 = yes)	0.4962	5.81	*	0.9867	5.51	*
Homemaker (1 = yes)	−0.3682	5.33	*	0.2154	0.55	
Former business owner (1 = yes)	1.3358	27.88	**	0.6160	1.14	
Business angel (1 = yes)	0.6720	12.28	**	0.3569	2.16	
Regional variables						
Self-employment rate 2000 (in %)	0.2044	7.71	**	−0.0414	0.14	
Purchasing power 2005 (in 1000 CHF)	0.0306	4.31	*	0.0269	0.46	
Year 2007 (1 = yes)	0.0968	0.52		−0.1191	0.23	
Constant	−10.5616	50.38	**	−8.4623	9.74	**
N		5338			2216	
Nagelkerke R-Square		0.076			0.063	

Notes:

** Significant on 99%-level.

* Significant on 95%-level.

[a] The variable age was introduced into the models in single form and as age-squared in order to control for non-linear relationships. In all the described models, the age variable has a positive impact on the probability of starting a new business whereas the age-squared variable has a negative influence. Therefore the combined influence of age on self-employment takes an inverse U-shaped form. The combined significance of the two age variables is tested by using an adjusted Wald-test.

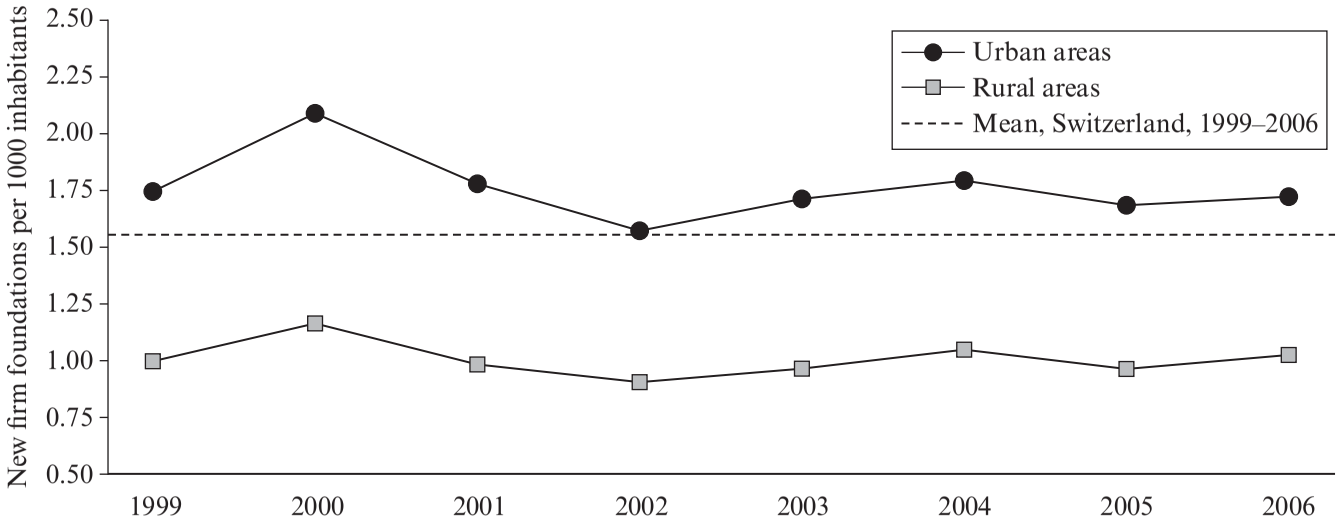
person-related variables, men have a higher start-up propensity than women. There is an inverse U-shaped relationship between age and entrepreneurial activity, education has a positive effect and being a homemaker has a negative effect. Former business owners and business angels are more likely to start a new business than others. Looking at the regional variables, there is a positive influence of the regional self-employment rate and of the regional purchasing power on individual entrepreneurial propensity.

Model 2 shows the results for rural areas, in which it is evident that some but not all relationships that can be found for urban areas are also prevalent in rural areas. We do not find an influence of being a homemaker, a former business owner or a business angel on entrepreneurial activity. Furthermore, none of the regional variables are significant. Thus, the influencing factors on start-ups in rural areas are more difficult to determine and the results for rural areas are often not in line with the theoretical predictions. However, it has to be acknowledged that in urban as well as in rural areas the explanatory power of the models is rather low, suggesting that in both cases a number of other factors such as chance and 'triggering events' are at work.

The main reason given for engaging in entrepreneurial activities differs only slightly between urban and rural areas. While in urban areas 60.4 per cent of all entrepreneurs start a business because they want to take advantage of a business opportunity, the respective share is only 56.3 per cent in rural areas. On the other hand, the percentage of so-called 'necessity entrepreneurs' is higher in rural areas, although the differences are not statistically significant.

Operation Stage: Results of the Entrepreneurial Process in Urban and Rural Areas

In order to examine differences in the third stage of the entrepreneurial process, the operation of a new business, we firstly compare the start-up rates in urban and rural areas on the basis of the UDEMO and the GEM databases. On average 11 442 new firms have been founded per year in Switzerland between 1999 and 2006 with the highest rate in the year 2000 (total 13 304). If the number of new firms is divided by the population in the respective area, considerable differences between firm foundation rates in rural and urban areas result (see Figure 14.2). We conduct a Kruskal-Wallis-Test on the means of the rural and urban foundation rates for each year and find the differences to be significant in all years. Firm foundation rates in urban were therefore significantly higher than in rural areas between 1999 and 2006.



Source: BFS and UDEMO.

Figure 14.2 New firm foundation rates in urban and rural areas in Switzerland, 1999–2006

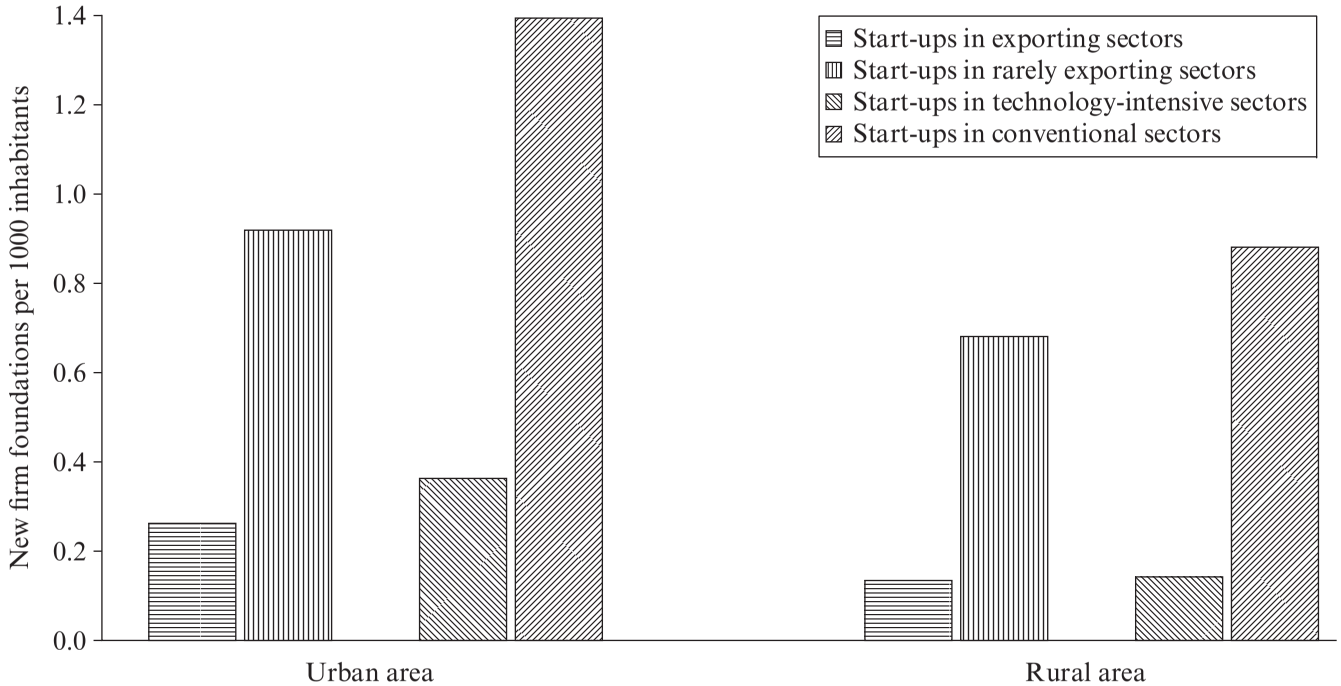
In contrast to the UDEMO data, GEM does not measure the number of companies in a given region but the number of people who are involved in entrepreneurial activities. The share of people currently trying to start a new business or who are owners and managers of a new business (TEA rate) is 6.0 per cent in urban areas compared to 5.0 per cent in rural areas, although the difference is not statistically different. Secondly, we focus our analysis of new firm foundation rates on business activities that are presumed to be of high value for regional economic development, namely, businesses that apply new technologies and procedures and business activities that show a high export orientation.

Figure 14.3 illustrates differences between rural and urban start-ups regarding the share of new firms in sectors with a high or low export orientation. We only consider the start-ups in sectors that have been classified by Balmer et al. (2007) as being either export oriented or oriented to the domestic market. To control for macroeconomic environment variances, we use the mean value of start-up rates from 2000 to 2005 and, again, normalize the start-up rates with population data in rural and urban areas. While only 0.12 business ventures per 1000 inhabitants have been founded in export-oriented sectors in rural areas, the share of export-oriented start-ups in urban areas is twice as high. The difference between the two rates is statistically significant (Kruskal-Wallis-Test).[3]

Figure 14.3 also shows the share of new firm formations in sectors that apply new technologies. Similar to the classification of export-oriented start-ups we use the classification of Duemmler et al. (2004). 'Innovative sectors' are those industry sectors that are most likely to apply new technologies. We normalize the sample by population distribution and use again the mean 2000–05 to control for macroeconomic and cyclical effects.

As Figure 14.3 demonstrates, the rate of new firm formation in sectors that are likely to apply new technologies in rural areas is less than half the rate in urban areas. The difference between the two rates is statistically significant (Kruskal-Wallis-Test). It should be noted, however, that so far we measure differences between urban and rural areas in terms of the number of new firms in certain sectors per 1000 inhabitants. Considering the fact that the new firm formation rate is considerably higher in urban areas compared to rural areas (Figure 14.2) the above discussed differences are somewhat mitigated. The higher share of start-ups in exporting and technology-intensive sectors can to a large extent be explained by the higher overall start-up rate in urban areas compared with rural areas.

This finding is also supported by the GEM data. In contrast to the UDEMO data, the GEM data allows the investigation of the export orientation and use of new technology of the individual firm and not only



Source: BFS and UDEMO.

Figure 14.3 *Start-up rates of business in sectors that apply new technologies in urban and rural areas by application of new technologies and export orientation*

Table 14.4 Characteristics of new businesses (TEA) in urban and rural areas (GEM survey 2005/2007)

	Entrepreneurs (TEA) in urban areas (n = 337)	Entrepreneurs (TEA) in rural areas (n = 98)
Exporting business (% yes)	39.4%	39.5%
Average share of exports	14.5%	15.8%
The technologies or procedures required for the product or service has been available for less than a year (% yes)	16.3%	9.2%

Note: It should be noted that due to the small sample size none of the observed differences is statistically significant.

the sector the firm is operating in. The share of new businesses that are exporting is almost the same in urban and rural areas (Table 14.4) and the average share of exports is even slightly higher in rural areas. However, the share of new businesses that use new technologies or procedures is higher in urban areas compared to rural areas. These findings are consistent with the findings of the UDEMO data where the difference regarding the use of new technologies is considerably larger between urban and rural areas than the difference in export activity.

To sum up, the analysis of new firm foundation rates in rural and urban areas of Switzerland shows differences in the third stage of the entrepreneurial process, namely, the operation of a business. The level of firm births and the level of firm births in industry sectors that apply new technologies or procedures are both significantly lower in rural than in urban areas.

DISCUSSION

Following the research framework of Stathopouluo et al. (2004), different entrepreneurial milieux lead to differences in entrepreneurial activities in urban and rural areas. In the case of Switzerland, we found such differences in all three stages of the entrepreneurial process. In the conception stage of the entrepreneurial process, our results suggest that the perception and creation of business opportunities is shaped by different attitudes towards entrepreneurial activities in rural and urban areas. People in rural

areas are less optimistic about business opportunities than are their urban counterparts. This result may reflect the fact that fewer business opportunities exist in rural areas but it might also be a sign of a generally lower entrepreneurial self-confidence of potential entrepreneurs or the lack of successful entrepreneurial role models in rural areas, as in the case of rural Catalonia (Vaillant and Lafuente 2007). We find differences for some but not all attitudes investigated. Furthermore, differences within Switzerland seem to be smaller than international differences in entrepreneurial attitudes (Bosma et al. 2008).

Concerning the realization stage, we find differences in the determinants of entrepreneurial activity. For the most part, the results for urban areas are in line with theoretical predictions and with the results of other studies on regional entrepreneurship differences. The factors influencing start-ups in rural areas, on the other hand, are far more difficult to determine. These start-ups are launched independently of the entrepreneurs' previous entrepreneurial experience and regional influences. This result corresponds to findings from other countries (Vaillant and Lafuente 2007). We do not find an influence of educational attainment and vocational training on the decision to become an entrepreneur in rural areas. Determinants that have not been tested in our study – such as the social and family embeddedness of the start-up process (see also Meccheri and Pelloni 2006) – may be more important in rural areas instead. Regional determinants of entrepreneurial activity, such as purchasing power and the regional self-employment rate which usually deliver significant results, fail to contribute to the explanation of the extent to which individuals engage in entrepreneurial activities in rural Switzerland.

Overall our results indicate that Swiss rural areas provide a milieu for entrepreneurial activities that is not yet fully understood. In rural areas, the explanatory power of our models is even lower than in urban areas, suggesting that other factors including chance, 'triggering events' and lack of alternative employment opportunities are more important than in urban areas. The explanatory power of our logistic regressions is rather low. However, this is consistent with other studies that investigate entrepreneurial activity at the individual level (for example, Bergmann and Sternberg 2007; Wagner 2003). Other studies that analyse regional start-up rates rather than individual start-up activities are able to explain more than two thirds of the variations in start-up rates (for example, Fritsch and Falck 2007). It is much more difficult to identify individual entrepreneurs rather than to predict the number of entrepreneurs in a region with known characteristics. There is always an element of chance or, as Bygrave (1997, p. 3) puts it, a 'triggering event' that makes somebody start a new business. Such triggering events are very hard to capture in large-scale population surveys.

We address the final stage of the entrepreneurial process – the operation of a new business venture – mainly by analysing start-up rates and characteristics of new businesses in urban and rural areas. The main finding from this analysis is that the share as well as the number of new businesses that use new technologies is considerably higher in urban compared to rural areas. It can be assumed that these firms have a greater impact on regional development than other firms. This finding is in line with Richard Florida's (2002) argument that urban areas are the nest of innovation and creativity.

However, it has to be acknowledged that, overall, differences between urban and rural areas are not as pronounced as one might have expected. Switzerland is only a small country with a well-developed infrastructure. In comparison to other countries, even peripheral regions are reasonably well accessible. There is not one single urban area that dominates the whole economy. It can be assumed that bigger countries with greater disparities between urban and rural regions show greater differences. Although certainly a special case, there are larger differences in attitudes and start-up rates between East and West Germany (Sternberg et al. 2006). Differences between urban and rural areas also seem to be larger in Germany than in Switzerland (Sternberg and Bergmann 2003).

CONCLUSIONS AND OUTLOOK FOR FUTURE RESEARCH

The results presented from two Swiss datasets are generally in line with recent empirical research which finds entrepreneurial activities to differ between urban and rural areas in Europe. Our results suggest that in rural areas the entrepreneurial process and its results are to some degree different from the urban area. In the case of Switzerland, these differences exist but are not as pronounced as they might be in larger countries with greater economic disparities. Still, researchers should consider treating urban and rural areas separately in future empirical studies on entrepreneurship. Such a separation might not be necessary for all research questions but should seriously be taken into account in studies of regional differences in entrepreneurial activities. Analysing urban and rural areas in the same model while only taking account of population density or an urban–rural dummy variable might not be sufficient because this approach assumes that the basic processes and influencing factors are the same in both types of regions.

Our evidence from the Swiss case further supports the conclusion by Toedtling and Trippl (2005) that there is no 'one-fits-all' regional policy

approach to foster innovation and entrepreneurship. If the new regional policy in Switzerland aims to support entrepreneurial activities in rural areas successfully, the differences identified in entrepreneurial activities in an urban milieu at all three stages of the entrepreneurial process should be taken into account. The generally lower level of new businesses in rural areas, particularly in innovative business sectors, for example, challenges traditional policy approaches that aim to stimulate entrepreneurship in high-technology and R&D oriented industries (see, for example, Audretsch and Feldman 2005). Policy instruments that focus on the sustainable development of businesses in the manufacturing or tourism sectors may better fit the rural entrepreneurial milieu. Rural areas at least provide 'resources that are highly valuable for a growing part of the society. [Such resources] can constitute a good business opportunity' (Dinis 2006, p. 14) waiting to be exploited by rural entrepreneurs. In order to develop policy measures that aid rural regions to develop a favourable entrepreneurial milieu, further research has been set up.[4] The ongoing project aims to identify determinants that more specifically describe a favourable entrepreneurial milieu in Swiss rural regions.

A limitation of our study is that we only use a binary distinction between urban and rural regions and do not take into account the fact that there are different types of rural regions even within Switzerland. The approach was made necessary by the sample size of the GEM survey with respect to rural regions. Wagner et al. (2009) provide an example of a classification of Swiss regions, based on a cluster analysis that could act as a starting point for further analyses. Furthermore, due to data limitations in our multivariate models we only include regional variables at the canton level. Since some cantons are rather large, this level might be too highly aggregated to find statistically significant influences on entrepreneurial activities, especially in rural areas which are sparsely populated. Local conditions might be more important than cantonal conditions for the individual decision to start a new business. Further studies should therefore conduct similar analyses on a lower level of spatial scale.

NOTES

1. NOGA stands for Nomenclature Générale des Activités économiques and is a classification of the economic activities in Swiss enterprises in coherent groups provided by the Swiss Federal Statistical Office. The classification is modelled after the latest version of the statistical classification of economic activities in the European Community (NACE, rev. 2). However, it takes into account the needs of various stakeholders in Switzerland, too.
2. In order to compare the findings from the GEM and the UDEMO data source, we

excluded firms that have been founded in the primary sector (agriculture and forestry) from the GEM data source. We do so mainly because the UDEMO statistics do not cover firms in the primary sector (Grossi 2005). Furthermore, agriculture and forestry just contribute 1.3 per cent to the Swiss gross national product and employ only 3.7 per cent of the total Swiss labour force.

3. In the analysis of the UDEMO dataset export activity of rural firms may be slightly underestimated since Balmer et al. (2007) do not classify economic activities in the hotel and restaurant industry as export oriented. Many non-agglomeration areas in Switzerland, though, depend strongly on foreign tourism and show high start-up rates in this sector.
4. The research project entitled 'Entrepreneurship in Swiss Rural Regions: A Spatial Analysis' is founded by the Swiss National Science Foundation (SNSF, Grant No. 100013-118012) and looks at entrepreneurial activities as an important engine for rural development. In this project, the characteristics of rural entrepreneurship and their spatial distribution are studied within the rural regions of Switzerland.

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