Introduction*

Jan Ulijn, Dominique Drillon and Frank Lasch

FIRST COMMENTS

This book, *Entrepreneurship, Cooperation and the Firm*, is the result of a network of European scholars, practitioners and members of public institutions interested in the critical issues of emergence and survival of technology and knowledge-based firms. The authors are drawn from eight European countries and one from the United States. They represent 14 universities, three research or public institutions, one global firm and one incubator for high-tech start-ups. At the start of the third millennium, the European Union (EU) faces a number of critical challenges linked to its capacity to master economic, social and environmental change. Against this background, some key figures inform the reality in which entrepreneurship takes place in Europe. The 25 member states have a combined population of some 460 million people (Eurostat, 2004), exceeded only by China and India in terms of population. However, despite the EU being the most important economic region in the world with a trade surplus of €74 billion (ibid.) there are significant challenges facing the Union.

The average unemployment rate, for example, is above 9 per cent (Eurostat, 2003) involving more than 15 million people. This average masks sharp spatial disparities: the range goes from 3.5 per cent in countries like the Netherlands or Luxembourg to nearly 20 per cent in Poland. This index (as defined by the International Labour Organization), has been increasing since February 2005, after a period of stabilization and amelioration (Eurostat, 2005). Not only is the overall unemployment situation critical,

* Throughout this book many different terms are used for the same concept. 'High-technology ventures' in the title corresponds to: 'high-technology start-ups' (Chapter 1), 'high-tech ventures' (Chapter 5), 'technology or techno-start-ups' (Chapter 7) and 'high-tech start-ups' (Chapter 9). This is not only because of a need for stylistic variation in the use of synonyms, but it also fits with the reality of the jargon used with regard to this concept. We have respected the use of those synonyms, because where a particular term has been adopted the different authors generally give clear definitions with regard to their own research data, however, the reader will find complete coverage of the different terms for further study in the index. Basically those terms are mutually inclusive semantically, except 'techno-start-ups', which might also refer to low-tech companies.

but the amount of insecure employment is also rising in the EU. Job flexibility has become a pressing reality for firms and companies.

Another paradox characterizes the EU: despite the growth of GDP (6 per cent in 2004), poverty continues to be present. Using the official definition of poverty of the European Commission, some 68 million inhabitants live in conditions close to the level of poverty. A high unequal distribution of produced wealth is one economic challenge that the EU has to face, and sharp spatial disparities concerning the issue of poverty between the member states emphasizes this situation. Depending on the average income in a member state, the level of poverty varies strongly in the EU, from more than €12 000 annual income for Luxembourg to €3000 in Portugal. But poverty is multidimensional – in addition to the economic and financial aspects, another dimension needs to be considered: the difficulty of living a decent life, and having access to basic services (nutrition, health, education, accommodation and so on). Moreover, a new phenomenon is appearing: people in employment, but whose salary is insufficient to enable them to afford decent accommodation or housing.

The EU displays continuing employment losses in different industries, especially ‘traditional’ ones like textiles. Those jobs are often relocated internationally into other, ‘periphery’, regions. The concerned governments and institutions can barely conceal the extent of the phenomenon. Even if in some rare cases government action moderates the tendency of relocation, this economic challenge will be part of the EU economic situation in the coming decades. The social consequences are important, sometimes dramatic. The responsibility of the companies (managers, shareholders) is directly concerned with crucial decisions in terms of investments or relocation. Compared to ‘traditional’ industries, which are under a constant threat of relocation, companies with a high added value, characteristic of innovation and knowledge-based industries (high-tech ventures, aerospace engineering, biotechnologies and so on) seem better able to resist the drift to low-cost regions and remain in core economic regions of the EU.

A positive point is the new firm formation rate of the EU, which remains on a high level and underlines continuing entrepreneurial dynamics despite an unfavourable economic situation. Nevertheless, scholars agree that nearly half of the new firms disappear after five years. For an economy and society that shifts more and more towards a liberal and entrepreneurial model, research can offer a better understanding of the conditions in which emerging and new ventures start up, fail, survive or grow. Scholars agree that entrepreneurship and emergence of new organizations is not only a necessary phenomenon for the renewal of existing firms and industries, but has become a major source of job generation, especially through

small and medium-sized enterprises (SMEs). Since the Birch study (1979) the shift from large company wealth and employment creation to SME job generation dynamics has been empirically demonstrated in the US context. Entrepreneurship in the EU is increasingly associated with the emergence of very small organizations, especially in the service sector or other emerging industries such as information and communication technology (ICT), biotechnology or other innovation and knowledge-based industries. In this context, recent studies stress a number of issues that foster entrepreneurship and especially those of small organizations. Issues such as geographical proximity and cooperation are examples of current and future directions of new research for a better understanding of the process of organizational emergence, survival and growth. Innovation and synergy play a crucial role in regional development and competitiveness (Ritsilä, 1999). In particular, new forms of cooperation, such as strategic alliances, are at the heart of the scientific discussion (Audretsch, 1998; Collinson and Gregson, 2003; Nguen and Vicente, 2003). Scholars argue that cooperation leads to further cooperation (Varamäki and Veslainen, 2003). Indeed, start-ups emerge in a context of coexistence of competition and cooperation (Astley and Fombrun, 1983; Nalebuff and Brandenburger, 1997). Examples of cooperation in the EU on a national level between existing companies are well known and commonly linked to large firms.

The European aeronautic industry, for example, demonstrated an innovation capacity and a willingness to cooperate, resulting in a relatively short time in a high level of international competitiveness. The Concorde project also illustrates a vast technical cooperation between France and the UK, even if the plane was a commercial failure and performed its last flight in 2004. A perfect illustration for a successful cooperation is the Airbus project, which demonstrates that firms with a different culture and size can cooperate successfully in order to become leaders of their industry. Some key points of the Airbus history illustrate this process. In 1969 Airbus started as a French–German initiative to build a ‘European’ aeroplane. The need to cooperate was the crucial point to compete with the American domination of the industry at this period. France and Germany were the two big ‘motors’ of the Airbus project that developed to become a European consortium with several companies from different countries (Belgium, Germany, France, the Netherlands, Spain, the UK and so on). The organization now comprises several subgroups, coordinated by only one authority, which is the ‘brain’ of this great project that guides the different teams.

Of course, it may not be applied generally in others sectors, but this spirit also sets an example for international research projects, like that leading to

the present book. Headquartered in Montpellier (France), aiming at cooperation on entrepreneurship issues across multilevel cultural borders, the research group, SURVIE (Start Up Research and Valorization/Valuation of Intra- and Entrepreneurship in Europe), was created in 2004. The first meeting was held in Montpellier (France) in March 2005, the second in Portoroz (Slovenia) in November 2005 and a third meeting took place in October, 2006. This network started with a 'core' group of scholars belonging to the former 15 EU members (France, Germany, the Netherlands, the UK, including later scholars from Belgium, Austria and Ireland), completed by researchers from countries that recently joined the EU (Estonia and Slovenia) and will enlarge the group with members from applicant countries (Bulgaria, Romania and Turkey) or from Norway and Switzerland as neighbours of the EU. The character of this research network is voluntarily interdisciplinary. All these researchers belong to several disciplines: economics, management, human sciences, education sciences and so on. They have in common an interest for corporate entrepreneurship and the emergence, development and survival of firms, in addition to the contribution of the diverse parts of Europe to a more entrepreneurial economy and society. This is the leading issue that motivated the SURVIE European network, which brings together different viewpoints, findings and research results. This book contributes to this overall aim through its focus as expressed in the title: *Entrepreneurship, Cooperation and the Firm: The Emergence and Survival of High-Technology Ventures in Europe*.

HOW DOES EUROPE COMPARE WITH THE US ON THE EMERGENCE AND SURVIVAL OF HIGH-TECH VENTURES?

Frank Lasch

The previous section presented selected key figures for the contemporary economic situation of the EU in order to point out future challenges and the overall context in which entrepreneurship takes place. The main contribution of this book is to give a deeper insight into a series of issues linked to the emergence, cooperation and survival of European start-ups, especially in the high-tech sector. Before we advance this perspective, we shall briefly outline differences between the conditions met by entrepreneurs in the US compared to those in Europe.

Since the end of the Fordian growth regime, dominated by economies of scale and large-firm value creation, the role of entrepreneurship has

changed markedly to become the major source of new firm and job generation in the US and in Europe. In this context of a shift from economies of scale towards a knowledge-based economy, competitive advantages for SMEs, especially in innovation and knowledge-intensive activities, offer huge opportunities for entrepreneurship for this type of organization. The reversal of the trend was first described by Birch (1979), and since then, SMEs, traditionally considered as being less productive, less efficient, less innovative and making a relatively modest contribution to employment, are at the heart of research and political debate. Several studies about the emergence of small-sized entrepreneurship in the US and Europe confirm the growth of the importance of SMEs on both sides of the Atlantic (Loveman and Sengenberger, 1991; Acs and Audretsch, 1993). Audretsch and Thurik (2002) explain this shift towards SME entrepreneurship with reference to increasing globalization, which requires knowledge-based economic activity. According to Audretsch (2002), like in the US, the decreasing competitiveness of large firms is also a reality in the EU and restructuration has resulted in waves of corporate downsizing in order to preserve the viability of large firms. He points out two possible strategies to maintain competitiveness in traditional industries: increase productivity by means of innovation and technology or delocalize economic activity and employment into lower production cost regions. As a consequence, both strategies would suffer significant employment losses in the domestic economy.

Against this background of decreasing employment in large firms, empirical findings for France, for example, demonstrate the growing importance of small-size entrepreneurship for employment in little more than 10 years. From 1987 to 2001, the percentage of jobs generated by start-ups with fewer than 20 employees rose from 77.6 to 83.6 per cent (Lasch, 2003: 36). The shift from the industry to the service sector is also visible: the part played by the industrial sector in entrepreneurship decreases in the same period of observation from 10.3 to 7.4 per cent, while the business and private customer related services grow from 32.9 to 40.0 per cent (*ibid.*: 60). One of the most dynamic activities is the ICT sector. In this knowledge-based sector the number of firms in 2001 was 31 200 more than in 1993, and employment rose from 220 000 to 710 000 (*ibid.*: 93). Nine firms out of 10 in the ICT sector are small-sized service firms.

But while it is generally admitted that most jobs are created in small firms, studies for the different EU member states indicate that the situation in Europe is far more complex than that in the US. Audretsch (2002) presents findings of a large literature review on this issue. In the United Kingdom, for example, similar to the US, small enterprises create most of the new jobs and the job loss rate is lowest for this category. By contrast, in

Sweden, Finland and the Netherlands the high job creation rate of small firms goes hand in hand with the highest rate of job destruction. In Germany, job creation rates linked to small-sized entrepreneurship seem not to be systematically related at all (*ibid.*: 14).

Closely linked to the question of entrepreneurship intensity is that of performance and survival. A sustainable contribution of entrepreneurship to the employment situation of the domestic economy can only be achieved if the new ventures survive and grow. Audretsch (*ibid.*: 18) finds relatively little difference between the US and Europe: growth rates are higher for smaller and also for younger enterprises and even lower for small and young enterprises in high-tech industries. In the same way, the likelihood of survival is lower for small and also for younger enterprises and the risk of failure is higher in small and young high-tech industries. Results from France confirm these findings. Lasch (2003) argues that high firm birth rates in the ICT go hand in hand with a high mortality. So, after five years, only 38.7 per cent of the firms in the ICT sector survived, compared to 51.0 per cent in the middle-high technology and 46.3 per cent in non-innovative sectors. Thus young ICT SME firms tend to be extremely fragile, but those that survive create more jobs than new firms in non-innovative industries. Nevertheless, most net job creation is done by a minority of firms that display an extremely high growth potential (*ibid.*: 137).

These findings indicate that the structural differences of entrepreneurship in Europe are relatively similar to the US, but the most important difference is a difference of levels compared. From our point of view, this major difference is twofold: first, a difference of interest in entrepreneurship as a research field, and, second, a cultural difference mirrored by the high level of entrepreneurship of the US economy compared to the EU.

In comparing Europe with the US, there is a significant time lag in the appearance of entrepreneurship research of more than 10 years. In the early 1980s, the first real entrepreneurship-focused conferences appeared in the US and Babson held its first conference in 1981. Entrepreneurship research starts significantly in Europe in the mid-1980s, but at the same time more than 50 departments and 52 full professors in universities already existed in this field in the US (Katz, 1991). In 2002, Aldrich (2005) counted nearly a hundred US research institutions devoted to entrepreneurship, and the number of endowed chairs in entrepreneurship grew so rapidly that in the 1990s many were vacant for several years.

When we take France as an example of the entrepreneurship research landscape in Europe, we begin to appreciate the huge time lag compared to the US. In France, the first dissertation in management science devoted

entirely to entrepreneurship was published in 1993 (Bruyat) and doctoral research is still a recent phenomenon, with only 22 PhD dissertations between 2000 and 2005 (Paturel, 2004). The first entrepreneurship discussion forums were held in 1993 with the creation of the 'Conférence Internationale Francophone en Entrepreneuriat et PME', mainly a conference for research on small business studies, PME (Petites et Moyennes Entreprises (Small and Medium-sized Enterprise)). In 1999 the first conference devoted entirely to entrepreneurship 'Académie de l'Entrepreneuriat' took place, and in 2001 the first entrepreneurship journal, *Revue de l'Entrepreneuriat*, was founded. Entrepreneurship articles in the field are mainly published in management journals such as *Revue Française de Gestion*, *Finance Contrôle Stratégie*, *Revue Sciences de Gestion*, *Gestion 2000*, *Management International* and so on, and from an international perspective, French scholars are relatively invisible: barely 10 publications in the three top-ranked entrepreneurship journals have been identified in the last 10 years (*Journal of Business Venturing*, *Entrepreneurship Theory and Practice* and *Entrepreneurship and Regional Development*; Lasch and Yami, 2005). The situation is somewhat similar in other countries, for example, Germany: although the Interdisciplinary European Conference on Entrepreneurship Research, founded in 2003 by German scholars, has become an annual conference with growing importance for European researchers, no journal devoted to the field has yet been set up in Germany.

The second major difference is linked to entrepreneurial culture and displayed by the results regularly achieved by the US each year in the Global Entrepreneurship Monitor (GEM). In the first year of this cross-national comparison of entrepreneurship activity, the US are top ranked with 8.5 per cent of the adult population starting a business (Reynolds et al., 1999: 32). This result underlines the strong entrepreneurial culture, in which the desire to be independent is associated with starting a new business. When we compare the countries that were involved in the GEM project every year during 2000–04, the average entrepreneurial activity index ranks the US in third place behind Argentina and Australia (Acs et al., 2005: 17). The entrepreneurial activity of the US is measured twice as high as the GEM country average (12.4 to 6.9). If we take into account the European countries that have participated each year during this observation period, their entrepreneurial activity is slightly below the GEM average (6.3). For Germany, an average of 6.1 is measured and France has the lowest of all European countries (4.8). These findings are clear indicators of cultural differences in terms of attitudes towards entrepreneurship and point to more or less favourable conditions for entrepreneurship across countries.

But one last point which makes it extremely difficult to compare research results on the critical issues of emergence and survival of high-tech ventures is common to entrepreneurship research in both the US and Europe: the lack of analysis of one sector at a time (Johnson, 2004). So future research should focus more on the analysis of one sector across regions or countries in order to validate or invalidate findings obtained without any industry criteria. Against this background, cooperation of a European research network focusing on the same sector of activity presents a huge potential of contributions to the field.

WHY SHOULD HIGH-TECH VENTURES COOPERATE IN ORDER TO EMERGE AND/OR SURVIVE?

Jan Ulijn

Despite the interesting cross-cultural differences in the emergence and survival of high-tech ventures which this book will describe, the study by Voss (2002) replicating Rokeach's and Schwartz's theory of values (see Vedina et al., ch. 11 in this book), shows that three human values appear to have a strong predictive power towards foundership and business ownership: risk propensity, innovativeness and proactivity. In this respect, the above comparison of the EU and the US, the entrepreneurial nation of the world (not to mention the present and future roles of China, India and Brazil) might indicate a different dealing with those three key factors. There is lot of innovativeness in Europe, perhaps as much as there is in the US, but it does not lead to new businesses to the same extent – for instance, in the different fields of science and engineering, such as biotechnology and aerospace. With a population of more than double that of the US, the EU appears to have fewer risk takers in business (see Groen et al., 2006). Both in the US and the EU, more than 50 per cent of new ventures might not survive their first five years, but the reason is different. The symbol of the Greek goddess of the hunt for the US-based DIANA project might illustrate this. It reflects a strong (female) proactiveness towards a new venture: 'If you have failed, just try it again, Sam'. Investors might even appreciate your persistence in trying your venture again and again, and learning throughout the survival process. What would be the average reaction of a European banker?

The EU defines its own way of attaining the objectives of the Lisbon agreement to become the most competitive and dynamic knowledge-based economy in the world by 2010. What is the rationale behind the SURVIE concept and the title of this book? Apart from the 'E', which

might stand for Emergence, Europe and Entrepreneurship and the 'I' of Intrapreneurship (to bring scientific and engineering results from the research and development (R&D) of multinational companies (MNCs) to the market, which is not the topic of this book (see Menzel, 2007 for a recent study), the 'S' of Survival and the 'V' of Value are essential – values not only as a given token (that is, money or culture), but also as something to develop in a process of Valuation or Valorization.

How can more (high-tech) start-ups bring more value of all kinds to the European and global economy? Is the answer survival through cooperation and beyond that, growth and more wealth for more people in all continents? It is the belief of the editors of this book that this valuation or valorization process needs another mindset, a mentality or culture containing not only the different layers of the concept of culture from the outside to the inside – artefacts, norms, values, attitudes, perceptions and assumptions about self and others – but also on the levels related to one's life cycle, that is, going from a strong national culture exposure through an educational and professional one to a corporate one, no longer in one firm or organization, as was the case before and after the Second World War. See below for further definitions, but this distinction between national, professional and corporate culture (NC, PC and, rather less, CC, because most start-ups still have to develop this; see Ulijn et al., 2001, for a substantiation of those levels in a comparison of 12 Dutch and 12 German firms) is key to the outline of this book, as well as the mutual perception: how are techno-starters, for instance, perceived by the market and the society as a whole and by their peer engineers looking for the job security of a big MNC (and vice versa)? Needless to say, the answer to this question also determines one's chance of emerging and surviving through cooperation with those parties as well (for a study on how different cultures perceive different things, for instance, in looking at the same intercultural business negotiation, see Ulijn and St. Amant, 2000).

Values can also be related to different capitals (see Bourdieu (1986); also referred to in Calay et al., Groen et al. and Kirwan et al., chs 6, 9 and 12, respectively, in this book) and the resource-based view theory outlined by Wernerfelt (1984). A resource can be anything that can be thought of as a strength or weakness of a given firm. Beyond this, Lerner and Almor (2002) perceive the firm as an aggregation of resources (for example, assets, capabilities, organizational processes, firm attributes, information and knowledge) to be controlled in order to conceive and implement strategies that improve its efficiency and effectiveness. Those, in turn, are then translated by management into strengths and weaknesses of that firm. Thus the underlying assumption for the elements of the title of this book is the valuation process through a culture of cooperation on the different layers and

group levels (nation, profession, firm). Survival gives the impression of a defensive attitude of reactiveness, rather than proactiveness, which might be the feeling of many European techno-starters in comparison with their US peers, but once put into the perspective of social innovation in response to technical innovation and related to sustainability, as is outlined in Part II, this might allow us to get away from a rescue syndrome: who is going to help us in our distress?

Therefore, if this book can prove, or at least illustrate, that cooperation alternating with the incentives of the competitive edge of the market might lead to a higher survival rate and ultimately the growth of techno-ventures, how then can we help them to survive and grow? Is help needed and by whom? It might give techno-starters and their stakeholders an insight and awareness into whether to cooperate or go it alone, and if the first is true, with which partner? How important is the role of the individual versus that of the institution of all levels: government, market parties and so on (Part I)? What about the ‘helicopter’ aspect of cooperation and survival through sustainable growth, viewed through some kind of econo-graphic lens (Part II)? Finally, does the success of the venture depend on his/her cultural background: NC or PC, as Ulijn et al. (ch.1 in this book) seem to indicate? In a broader perspective, how would a cultural level, such as that of nation, gender, profession, sector or region, affect the cooperation and survival of techno-starters (Part III)? Thirty-four contributors from different national cultural areas such as Anglo-Germanic (North America and Northwest Europe: US, UK, Ireland, Austria, Germany and the Netherlands), Latin (Midwest Europe: Belgium and France) and Balto-Slavic (Estonia and Slovenia) (Table 0.1) might provide the right intercultural mutual perception to avoid a biased view of the book’s topic. ‘Cooperate or become bankrupt’ seems to be the issue, that is, cooperate to survive. Can this book substantiate this thesis? First we need some more definitions and research methods to give us some more insight into this question of cooperation, and ways to prove or reject its importance.

Table 0.1 *The 34 contributors to the book by national cultural area*

National cultural area	Country (number of contributors)
North America (Anglo)	United States (1)
Northwest Europe (Anglo-Germanic)	Austria (1), Germany (4), Ireland (1), Netherlands (10), United Kingdom (2)
Midwest Europe (Latin)	Belgium (3), France (3)
Eastern Europe (Balto-Slavic)	Estonia (2), Slovenia (7)

THE QUESTION OF DEFINITIONS AND METHODOLOGY

Jan Ulijn and Dominique Drillon

This book's title will pretty much bring forward the concepts to define and furnish with some background detail: entrepreneurship (and the entrepreneur), cooperation (and the firm), high-tech ventures (and the relation with technology and innovation), their emergence and survival stages (including sustainability at the institutional level) supplemented by the role of the individual (his/her gender, engineer or scientist) and the context of Europe including its cultural levels, not only among member states, but also professionals, engineers versus marketers and so on). What kind of definitions do we need? One weakness of starting a study by asking for the right definition is to take a lexicographic approach – if you want to define a concept, look up the related term in a dictionary, a seemingly easy choice without too much explanatory force, and it will be split into formal descriptors: other words without necessarily a logic of operation or argumentation behind it. For example, a definition of a bicycle in a dictionary will generally use the bare minimum to coin that term, but never explain how such a machine could be designed, operated by a cyclist or lead to a construction drawing to manufacture it. Similarly in this domain of high-tech ventures and cooperation, operational, strategic or simple working definitions might be more helpful than a 'dictionary' approach. An operationalizable definition of cooperation in Ulijn et al. (ch. 1) might lead to testable hypotheses, a strategic definition of entrepreneurial culture in Vedina et al. (ch. 11) might imply a notion of how to develop entrepreneurship and how to change culture as part of a business strategy. Some key concepts reflected in the title of this book will be reviewed here, but for details the reader is referred to the 12 individual chapters. We deal briefly here with: entrepreneurship and the entrepreneur, cooperation, high-tech ventures in their relation with technology and innovation, their emergence and survival or sustainability. Who is the techno-starter: a man or a woman, a scientist or an engineer; and where is s/he starting in Europe, in which (national or professional) culture?

The field of entrepreneurship and the entrepreneur is a conceptual and terminological jungle of definitions and approaches. Is this because so many disciplines are interested in it? This is not the place for a complete paradigm discussion (see several chapters in Fayolle et al., 2005 and the studies they refer to). What is an entrepreneur? According to Casson (2003: 203) a quite simple working definition might be 'a self-employed owner of a firm', but see Verhoeven et al. (ch. 2 in this book) for other coinages of the term. In

an institutional perspective on entrepreneurship in international business Wai-chung Yeung (2002: ch. 1) lists as main disciplines: development economics studying the relation with economic development (starting with Joseph Schumpeter in 1934); management studies interested in the link with (international) business venturing with international entrepreneurship, as a focus; and history, sociology and anthropology connecting entrepreneurship with business history and ethnicity. It is astonishing how little attention that a discipline such as psychology has so far paid with regard to the (starting) entrepreneur and the phenomenon of entrepreneurship. Kyrö and Kansikas (2005) found in the 337 refereed articles of the 12 top journals of entrepreneurship research that 52 per cent related to business and the firm, while the individual, including his/her relationship with other levels of analyses such as business, society and the economy, was covered by 28 per cent of the studies. Perhaps a meagre 4 per cent was devoted purely to the individual. Possibly this is because of a so-called ‘failure’ of the relevance of the psychological traits theory as a predictor for successful entrepreneurship, for which the broader context might play a predominant role rather than the relation between the psychology and the culture of the entrepreneurs (Brown and Ulijn, 2004: ch. 1). Nevertheless, since the emergence and survival of high-tech ventures in Europe and elsewhere always starts with the individual, a definition is adopted as a working one for this book, building on the one by Schumpeter, which had already underlined the importance of the individual (Menzel, 2007): ‘Entrepreneurship is a process by which individuals – either on their own or inside organizations – pursue opportunities without regard to the alienable resources they currently control’. This book tries to stress the interplay between the individual, economic and social context and group culture with regard to the relevance of cooperation for high-tech ventures in Europe.

The second element of this book’s title is cooperation (and the firm). Whereas the firm is further defined as the high-tech venture below, cooperation can take in the institutionalized form of a network, such as that developed by Castells (2004) who makes a cross-cultural and technological analysis of the transformation of our society due to the ever-increasing role of ICT. Between firms it may also imply institutionalized forms of collaboration, such as through strategic alliances. The awareness of a collaborative advantage between firms has led to the necessity to manage collaboration, for which Huxham and Vangen (2005) combine theory and practice and which includes the use of power and the resolution of conflicts, not only by avoiding, fighting, problem solving and accommodation, but above all by collaboration in a win-win situation. This book focuses mainly on the individual/personal level of cooperation which is not stressed very much in the literature, but it does not go as far as teamwork

versatility, for which the Germans and Japanese are famous (see Ulijn et al., forthcoming). It is surprising that studies on entrepreneurship, such as those by Shane (2000 and 2003) and Shane and Venkataraman (2000) pay such little attention to this. Even for technology entrepreneurship, where the relation with R&D teams seems to be clear-cut, the strategic value of cooperation is still ignored, not only in the US (Dorf and Byers, 2005), but also in Europe, for example, in France (Fayolle, 1999 and 2004). There are, of course, exceptions: Rottner and Pickar (2004), draw lessons in interdisciplinary collaboration from the Caltech entrepreneurial fellowship programme in the Los Angeles area. Casson (2003) also sees the entrepreneur as an intermediary and coordinator. Within the dialectics of the proliferation of negotiated environmental agreements in Europe, control is seen as a traditional perspective and coordination as an innovative one (see De Clercq and Suck, 2002). Coordinating, yes, but cooperation goes beyond that. With respect to high-tech ventures or start-ups, the following definition might be a working one, as outlined in Ulijn et al. (ch. 1):

[A] functional system of activities between the HTSU [high-tech start-up] and one or more outside parties, with the purpose of improving its performance. Note that although the outside party may also benefit, key to this definition is the notion that cooperation, at minimum, benefits the HTSU.

High-tech ventures or high-tech start-ups are defined in this book as young companies whose aim is to produce technologically innovative products, processes and/or services. These firms typically generate a high turnover per employee. For further operationizable definitions, see Ulijn et al. (ch. 1) and Halman et al. (ch. 7). Both definitions complement each other, since Ulijn et al. stress more the firm level by origin, age, technology level, operating mode and digital access, while Halman et al. emphasize the age since foundation, the technology level specified as currently developing or distributing knowledge-intensive products, processes or services but also define the educational level of the founder and a high proportion of working time devoted to R&D (more than 10 per cent). Techno-ventures are strongly related to technology and open innovation, extensively described by Chesbrough (2005; see also Chesbrough et al., 2005) invites cooperation and mutual learning, as a new imperative for creating and profiting from a technology and research paradigm. Interesting examples are campuses where big and small firms together with universities share and jointly develop promising ideas and utilize R&D results in business application, such as at the University of Twente (Enschede) and the Philips R&D campus in Eindhoven (the Netherlands) and Nokia and the Helsinki University of Technology in Finland. In the traditional closed innovation

environment, for instance, at a university, it is considered smart to develop ideas in isolation, and protect the results by patents, which are immediately put on the market. In the open system it is acknowledged that there are also smart people outside, and internal and external ideas can be merged to create a joint business model that can be profitably marketed at a later date. The techno-venture on such an open innovation campus can act as a pressure cooker, where stakeholders are jointly responsible for interaction and partnering for the next 10 years. Beyond that, this rejuvenation stage might lead to a spin-out that is no longer labelled a 'high-tech venture'. As Part II of this book shows, this kind of campus can be enlarged into a national, regional or spatial innovation system and develop technologies in time and space, as Oinas and Malecki (2002), point out. MNCs have to manage technology and innovation for competitive advantage by making a strong collaborative mode part of their strategy, leading to alliances, joint ventures, mergers and acquisitions, as Narayanan (2001) succinctly describes.

It is precisely technology through ICT that brings people together from very distant disciplines and areas of the world, leading to innovation breakthroughs (see Hargadon, 2003): people who would never otherwise have met or influenced each other (see Gupta, 2004 for examples of managers' lives, work and careers in the twenty-first century). Innovation systems become virtual as is nicely exemplified by the present initiative of a virtual European Institute of Technology, where the best research groups in nano-technology, ICT and aerospace of both universities and industries can cooperate thanks to substantial EU funding, thus meeting the competition from American, Chinese and Indian key research centres but also inviting them to join: if you cannot beat us, join us. Needless to say, high-tech start-ups should be the natural entrepreneurial spin-offs of that cooperation and can play a major role in developing the required mindset or culture, as shown by Ulijn and Fayolle (2004), for instance, with regard to the position of French, Dutch and German entrepreneurial and innovative engineers. As recent issues of *RTD info* indicate (July and November 2005), scientific research still needs stronger international cooperation to bring about more global wealth: out of 13 statements on which to agree in a Eurobarometer survey, the top three linked up with cooperation between different European countries, and between science and industry including a plea for more coordination between the EU member states. This open innovation space of R&D may act as the cradle of techno-ventures not only for Europe but also in other parts of the world, as Wai-chung Yeung (2002) stated when he described the role of transnational entre- and intrapreneurs from different cultures, such as Americans, Germans and ethnic Chinese. However; one should not underestimate the costs of coordination of such

ventures purely on economic grounds. Casson (2003) argues that coordination can be partial as it concerns an individual's own field of competitive edge. So, within certain financial limits, cooperation and coordination should follow the principles of banking.

The last step in defining concepts and giving some background is to examine the emergence and survival stages (including sustainability at the institutional level) of techno-ventures, supplemented by the role of the individual (his/her gender, engineer or scientist) and the context of Europe including its cultural levels, not only among member states, but also professionals, engineers versus marketers and so on. In literature, various measures of performance exist. They range from survival as a basic *conditio sine qua non* criterion, to growth (employment or turnover), investments (total amount; foreign investments as a criterion of internationalization; R&D investments; and so on), innovation or productivity indicators. But each industry, each type of firm or each type of entrepreneur requires a specific selection of adapted performance indicators, and often individual criteria such as personal satisfaction of the entrepreneur are neglected (Lasch, 2003: 140). For this book, which mirrors the diversity of European entrepreneurship research and its huge creativity concerning research issues, methods and approaches, we did not consider it wise to fix upon one definition. The different chapters that deal directly or indirectly with performance use the most frequent ones: survival or employment growth. We choose to use 'sustainability' as a generic term for the performance of new emerging organizations as being the research object of the book, which does not deal with the pre-entry entrepreneurial process.

For the survival stage this book stresses the first five years after start-up in several chapters (Ulijn et al.; Halman et al.). Beyond this and after 10 years, such as in the Bradford case reported by Verhoeven et al., the techno-venture develops and reaches a maturity which marks the perspective of the firms that survived. The term of sustainability can also be used (see Part II). From the point of view of the entrepreneur, survival may also mean continuation, that is in another venture; see, for instance, the studies by La Pira and Gillin (2006), who relate their intuition to their performance, and by Rushworth and Gillin (2006), who describe their personal value systems and motivations in an Australian context. This is again a lesson for Europe where the feeling that one should not start a business if there is a risk that it might fail, is still very much in evidence (see Groen et al., 2006), in particular in Germany and the Netherlands. Interestingly, Inglehart's thesis (1997) about cultural change, tested in 43 societies all over the world and in 55 European regions, shows some parallels with this start-up syndrome in Northern Europe with a secular rational authority and high sense of well-being: why start a business, when you are rich already? North America and

English-speaking Europe believe strongly in the idea that someone who has failed in a start-up should be given a second chance: 'Try it, again, Sam', which corresponds with a high sense of well-being and is halfway between traditional (rooted in religion) and secular-rational authority: do religious values help in starting your own business? Inglehart sees this cultural change as a result of two characteristics of the postmodern society: secularization and individuation, where the continents lagging behind in wealth are trying to get away from traditional authority towards survival. China, South Korea and Japan (the Confucian area), together with the former communist Central and Eastern Europe, are the frontrunners in this process to become rich (see Drnovšek et al. (ch. 3) and Prašnikar et al. (ch. 10) on Slovenia or Vedina et al. (ch. 11) on Estonia). For Inglehart, survival is in opposition to self-expression, meaning that the survivor would give priority to economic and physical security over self-expression and quality of life, would not see him/herself as very happy, would not sign a petition of protest and would be very careful about trusting people. Thus traditional religious values would oppose rational ones. Catholic Europe (Belgium, France, Spain, Portugal, Austria and Italy) is at the crossroads of these two value systems, between survival and well-being and the traditional and secular-rational. To what extent this applies to the survival of the entrepreneur, is not yet clear, but might be the subject of a repeat study. The general cultural context plays an eminent role in the survival of high-tech start-ups and their founders. They might try to survive because they see in their well-being (and that of their employees) a self-expression or realization towards growth, maturity and wealth.

With regard to whether the founder of a techno-venture is a man or a woman, a scientist or an engineer, and what constitutes his/her personality, see Parts I and III. This has implications for the self-image of the techno-starter in a cultural level of assertiveness and affiliation (see Hofstede in several chapters of this book) and its relation with cooperation. Are women keener on this, because of their higher affiliation value and do engineers who are accustomed to working with project teams do a better job than selfish scientists, who all want the Nobel Prize? Is it also a matter of professional cultural difference?

Moreover, the book has 'Europe' in its title, an element that has already been introduced at the beginning of this chapter in its benchmark with the US (for a solid update on this, see also Audretsch et al., 2002). After two previous books in which one of us was also involved as an editor (Jan Ulijn), this picture is still incomplete with regard to Europe, innovation, entrepreneurship and new business development (Brown and Ulijn, 2004; and Fayolle et al., 2005). Europe is also a perfect example of an original national cultural diversity now more or less merging into one culture, but

preserving some of its original religious underpinnings, as demonstrated above by Inglehart's cultural/religious lens. In addition, it is an example of strong cooperation at the government level, with the EU and the single currency as a result; it also applies across Euroregions, the cooperation policy for which is described by Graute (ch. 8 in this book).

Although culture is a rather broad term, this chapter focuses primarily upon national culture (NC) and in particular, variables developed in earlier research by Hofstede (2001). According to Hofstede, culture can be treated as 'the collective programming of the mind that distinguishes the members of one group or category of people from another' (ibid.: 9); for more details, see Ulijn et al. (ch. 1). What is national culture other than other cultural levels, such as gender, age, profession, region and so on? The problem lies in the definition of a nation, which is mostly rooted in a political entity, and sometimes in ethnicity, such as the Arab nation in an Islamic world which does not make a distinction between state and religion. Hofstede's working definition of a mindset leading to observable behaviour has shown enough operationizable value to also be a yardstick for Europe. Weber (1958) has cited the Protestant ethic to explain the success of Northwestern Europe and North America, while Inglehart's picture depicts the borderland of Catholic Europe (of course), but also of Confucian values. Christian altruism, communion and so on, parallel sharing, empathetic values: '*Do unto others as you would have them do unto you*' (The Bible, Matthew 7:12). These values are at the forefront of Central and Eastern Europe thought in the emerging markets from the Balkans to the Baltic states, of which Dana (2005) gives a survey of surviving and renewed entrepreneurship. How deeply rooted in religious values entrepreneurship can be is well described for China by Young and Ciorzine (2004), who apply traditional Confucian practices of contemplation, self-scrutiny, discussion, reading and cognitive and affective development to contemporary entrepreneurship. Finally one of the principles of Islamic entrepreneurship as a work ethic in the Koran is cooperation (see Ali, 2005). Usury and interest as bank income are forbidden. The knowledge economy seems in line with old Islamic values: seek knowledge from the cradle to the grave. Muslim countries, such as Malaysia, Singapore and Indonesia, are doing well in this respect. Asians are keen to learn, and China and India will educate thousands of engineers with entrepreneurial talents and a cooperative spirit in the coming years. The female 'yin' means collectivism and cooperation, while the male 'yang' means individualism and competition which form a whole. Techno-starters will no longer be an exclusive phenomenon of the western part of the world and Japan, as has long been the case.

A similar holistic approach brings Dana (2006) to a proposal of a symbiotic entrepreneurship for the eurozone, and a reward for the introduction

of the European single currency. It seems to be an excellent substantiation of the ideal European business cooperation: let the Italians and the French design the product, let the Germans (or Swiss) manufacture it and let the Dutch (or the English) sell it. Europe might grow as a multicultural society not only by admission of non-Christian-based new member states, such as Turkey (Muslim) and (eventually) Israel (Jewish), but also through the migration flows from the 1960s that showed a large influx of cultures from countries such as (in order of decreasing numbers): India and Pakistan (mainly to the UK), former French West and North Africa (to France), Turkey (mainly to Germany and the Netherlands) and China (to all of Europe). This will increasingly be a source of Islamic, African and Chinese ethnic entrepreneurship – why not start your own techno-venture as part of the movement? This implies that the cultural/religious values as depicted by Inglehart might smoothly merge Confucian, Islamic and Christian (Protestant, Orthodox and Roman Catholic) values underlying a European entrepreneurial and innovative culture. Thus the survival, growth and maturity of techno-ventures might include not only the creativity of the individual, which is so much vaunted by the West, but also the commitment of a team, a family and so on, originating from eastern parts of the world. No longer just the US, but also Europe might serve as the playground for this. Is this view too optimistic? The EU and its individual member states might encourage techno-ventures, much more than it has done so far; protection by social security is largely unfair to start-ups which have to deal with too many rules and risks caused by government regulations at all levels: EU, state, province/department, EU region and so on. Social innovation in this sense might support technical innovation, which badly needs prosperous techno-ventures.

Finally, as indicated above, there is one cultural level out of the three generally distinguished (Ulijn et al., 2001) that has often been overlooked and might easily overrule the effect of corporate culture (not yet present in a techno-venture, unless as some heritage from the past of the founder) or even national culture as outlined above: that is, professional culture. What is it? Sirmon and Lane (2004: 311) define it as follows:

A professional culture exists when a group of people employed in a functionally similar occupation share a set of norms, values and beliefs related to that occupation. Professional cultures develop through the socialization that individuals receive during their occupational education and training.

It is an old concept which Berry (1994: 81) in his ecology of individualism and collectivism dates back to early humankind as a subsistence or survival phenomenon: gathering, hunting, with a collectivistic peak in

agriculture, followed by the industrial era with decreasing social conformity and increasing individualism. Those sectors of human activity also mark stages in professional culture development. Engineering in itself already conceals so many fields of specialization, as has been shown by Delinchant et al. (2002) and Legardeur et al. (2004) in some French cooperative design projects. In the design of both an electro-mechanical plunger and of sheet moulding compound composite material in the automotive sector, cross-disciplinary cooperation between different engineering disciplines appeared to be essential. A typical techno-venture struggles immediately with the question of the market, which is definitely the domain of a different professional culture from that of the average engineer: marketing (for a clear delineation, see Ulijn and Weggeman, 2001). Cooperation in a techno-venture between engineering and marketing cultures might be more important for survival than any European (national) cultural differences.

How should we answer the question posed in this introductory chapter: how can entrepreneurship and cooperation help more high-tech ventures in Europe to emerge and survive? In the next section we shall search for some underlying conceptual model or guiding principle for this book; once the definitions have been established, we can try to operationalize them using some available methods. It is remarkable that in a recent survey by Coviello and Jones (2004) of international entrepreneurship research reported in leading journals (55 in total in the 1989–2002 period), Europe is poorly represented or at least gives a disparate picture with six UK studies, plus Slovenia, Portugal and Finland (one each), 15 focus on the entrepreneur as the unit of analysis (32 on the firm), none on start-ups and five on potential entrepreneurs. The authors make a plea for a multidisciplinary approach combining positivist and interpretivist methods and reconciling static and longitudinal procedures and making more cross-national and replication studies. Similarly the Kyrö and Kansikas (2005: 141) overview of 337 articles in basically the same journals over the years 1999 and 2000 (cited above), estimates percentages for the whole field of entrepreneurship research (not only international): theoretical and model studies accounted for 11 per cent, qualitative ones for 11 per cent and quantitative in the wide sense for the rest. It is clear that to increase the ecological validity of such studies, more qualitative methods would be welcome, such as discursive description (68 per cent in the Kyrö and Kansikas sample) and case analyses for which Dana and Dana (2005) make a plea (21 per cent), but also narratives, ethnography and historical description.

This book covers a wide variety of methods, with the stress on qualitative ones, for instance through case studies which, according to Bhalla et al. (2005), allow for a multiparadigm perspective in entrepreneurship research. But, especially in Part II, two chapters use quantitative–empirical

approaches based upon secondary data, which illustrates that there are both (a) various methods for analysing one research issue at a time, and (b) specific methods that are more adapted to deal with certain themes.

The attempt to answer the question ‘can cooperation help techno-ventures to survive?’, has to be tentative because most of the methods and the theoretical framework are still to be developed. Case studies and narrative approaches, such as in Verhoeven et al., Wakkee et al. and Kirwan et al. (chs 2, 9 and 12, respectively) (most studies of Parts I and III have elements of this methodology) can hardly prove anything. Some empirical evidence from econometric/sociological/survey-based studies, such as in Ulijn et al., Drnovšek et al., Brennan and McGowan, Halman et al. and Vedina et al. (chs 1, 3, 4, 7 and 11, respectively) can give some indications. In all we have to be prudent about generalizations and the aspiration of this book can only be to illustrate that cooperation in the specified and described cases in our chapters helps techno-ventures to survive. It is probably the best bet after all, although the autonomous *Einzelgänger* (lone wolf) might be an attractive role model for some techno-starters. We could not find any evidence to suggest that this would be an easy way to arrive at sustainable results for a techno-venture.

AN UNDERLYING CONCEPTUAL MODEL OR GUIDING PRINCIPLE

Jan Ulijn

Most empirical studies have some underlying (applied) conceptual model and most of the individual chapters are no exception to this. Within the framework of cooperation between high-tech ventures in Europe this book might have one as such, but unfortunately again it cannot endorse this ambition of one conceptual model, since the subject matter covered in the title still has too many intangibles. We can only refer to some elements in the chapters which may serve as building stones for a future attempt. There are roughly three lines of thought in this matter:

1. Possible factors of the effect on cooperation between techno-ventures at a given stage, pre-foundation, emergence, survival, growth and maturity (specified in the particular chapters) should be considered.
2. Cooperation, support and skills of techno-starters are needed throughout the above life cycle from a longitudinal perspective, where the survival/growth limit has been defined as about six to ten years from the start-up.

3. The ‘model’ should include the effect of cooperation (or not) on the survival of the start-up at the above limit, as an independent variable for which to control.

First, the following factors of the effect on cooperation between techno-ventures are dealt with at a given stage of their life cycle: the role of the personality of the founder at the maturity stage in Verhoeven et al. (ch. 2). Some nations show more latent or potential entrepreneurship than others. As seen above, Americans show more willingness to take the risk of starting a business (see Groen et al., 2006). This might be due to an NC effect in Ulijn et al. (ch. 1) (until the survival stage), Lasch et al. (ch. 5) (within one country, France), Vedina et al. (ch. 11) (within the multicultural society of Estonia), Calay et al. (ch. 6) (within one region as part of an NC: Wallonia, part of Belgium) and Halman et al. (ch. 7) who present a comparison of European regions or countries: Eindhoven, the Netherlands and Darmstadt, Germany (to the survival level) and Chapter 12 which does so with Slovenia and Germany (but now at the growth and maturity level). Two chapters deal with the PC effect: Wakkee et al. (ch. 9) and Prašnikar et al. (ch. 10), where the common ICT sector seems to override the NC effect of Slovenia versus Germany. In Ulijn et al. there is a link, since in the larger study than that reported here, cross-functional experience was related to cooperative strategy and acceptance of a dissimilar partner, as a sort of PC dimension. Culture can also be seen as capital to be accumulated in the classic financial and technical types in the Bourdieu (1986) sense: economic and strategic, to be supplemented by social to establish and develop the venture. Chapter 10 highlights this effect at both the pre- and post-foundation stages. In Chapter 6, by ‘human capital’ Calay et al. probably imply something preliminary to social and cultural. Finally regional/support effects are assessed in more detail through the context of incubators (Slovenia in Drnovšek et al. (ch. 3), the university–industry interface in Northern Ireland in Brennan and McGowan (ch.4)) and the effect of the European regionalization policy on cooperation in Central and Eastern Europe (Graute, ch. 8).

Second, this book does not deal with the pre-founding stage leading to the emergence of the start-up for which Ulijn and Fayolle (2004) propose a model based upon Ajzen’s (1991) planned behaviour theory. A business start-up model would include a filter process fed by motivation, a raw idea, perhaps recycled up to six times, validation of the idea, scaling and looking and negotiating for resources before it comes to a launch. Possibly after family funding in its design phase, a ‘valley of death’ might appear with regard to the development and start-up phases: who is going to invest in the validated idea? Beyond this survival stage, venture capital is often available

to bring the firm to the growth phase, ultimately leading to the mature phase, where the firm may be sold or go public on the open market. The different stages require skills or personality traits of techno-starters throughout the above life cycle from a longitudinal perspective, such as creativity, drive, empathy and persistence at the start-up, courage and risk orientation, ability to reflect, strategic orientation and leadership and communication together with reliability and decisiveness, and personal values that subsist at the maturity level: reliability, decisiveness, persistence and determination (Dutch Ministry of Economic Affairs, 2001; see also page 1 of the introductory section). Both Verhoeven et al. (Chapter 2 of this volume) and Wakkee et al. describe Dutch cases in a longitudinal perspective, one from aerospace and two from electrical and physical engineering.

Finally an applied conceptual model should include the effect of cooperation (or not) on the survival of the start-up at the above age limit of six to ten years before the growth stage beyond the valley of death. All chapters deal with this key factor of success either explicitly or implicitly. The level of operationalization and empirical evidence is still in a stage that is too kaleidoscopic or exploratory to be conclusive, as has been inferred earlier. Ulijn et al. are probably the most specific on this one: how will the individualism and masculinity of the selected sample countries in 109 techno-starters affect their willingness to cooperate and accept a dissimilar partner? Interestingly six chapters (Ulijn et al., Verhoeven et al., Drnovšek et al., Calay et al., Halman et al. and Kirwan et al.) also report some findings on support as a form of a one-way cooperation which is generally not perceived as very positive in its effect on success. This might come as a surprise with all the government subsidies at all levels through incubators and academic help: the baby might be overincubated in its cradle!

What is the rationale behind the three parts of this book and how do they relate? If techno-starters are asked what their motivation is (Wissema, 2004), they say (in order of decreasing importance):

- I want to take responsibility for my own future (53 per cent);
- I relish the challenge of doing it alone (52 per cent);
- I want to be my own boss (48 per cent);
- I have a unique idea (43 per cent);
- I want to make more money (28 per cent);
- I am unhappy in my job (19 per cent), (Hofstede et al., 2004 mention dissatisfaction as a reason for self-employment: 25 per cent);
- I want flexible working hours (8 per cent); and
- I am unemployed (6 per cent).

This seems to be a rather selfish approach, not at all related to cooperation, but at the same time Wissema reports (personal communication), that most of the Delft University start-ups begin with two people at least, after a beer or so, as a team of friends who are likely to split up within four years, largely before the age of survival. Why is this? Is the role of the institutions from which those individuals come, the broader economic and market context and above all culture towards self-employment underestimated? To help more high-tech ventures in Europe to emerge and survive, a distinction between the individual and his/her context is very important (Parts I and II), but this is not easy, because there is overlap, as the distribution of our chapters over the book shows. Two comparisons of European regions therefore end up in different parts, Halman et al. in Part II and Prašnikar in Part III, because of difference in focus (geography in Part II versus culture in Part III). Part I focuses on the individual or person of the techno-starter, Part II presents a helicopter view and Part III brings in the other mindset, a set of values of different cultural levels needed to cooperate to survive, if we can prove or at least illustrate this point to an acceptable level. What is the role of the individual versus that of the institution (Part I)?

What different levels of intelligence are needed: cognitive/rational, social, emotional? What does the psycho-analytical approach teach us (Kets de Vries, 1980 and 1995)? What are the econo-geographic aspects of cooperation and survival (Part II). Cooperation, networks, local proximity effects and knowledge spillovers play an important role in national and regional innovation systems (geographical entities), as Fornahl and Brenner (2003) illustrate in a series of studies.

What are the cultural levels of nation, gender, profession, sector and region in emergence, cooperation and survival (Part III) in a cumulative effect? Techno-starters begin as an individual or with one or more partners, and face the broader econo-geographic context and the culture which surround them. They grew up in a country and hence have learned its NC value, undertaken their education, perhaps with some professional practice, and through this acquired a PC. If they worked with a company some years before the foundation of the venture, then they have also had some exposure to the CC values of that firm. Given the scope of this book it is impossible to cover all relevant cultural levels to the same depth. The effect of NC on cooperation between techno-starters is dealt with primarily, then comes the region in Drnovšek et al., Brennan and McGowan, Lasch et al., Calay et al., Halman et al., Graute and Kirwan et al., unfortunately not always testing an effect by comparison. Finally comes the professional culture and the sector, mostly ICT (in Lasch et al., Kirwan et al. and Prašnikar et al.), nano-, bio- and laser technology (in Kirwan et al.) and services versus others at some level in Ulijn et al. Some attention will be

given to the effect of gender, but none of our chapters focuses on this aspect exclusively. Theoretical underpinning of this part will be fed mostly by Bourdieu with culture as one of his and others' capitals; by Hofstede et al. (2004) who deal with the effect of NC on the above motivation of a start-up: self-employment out of dissatisfaction in roughly 19–25 per cent of the cases; for the overall distinction between NC/PC and CC by Ulijn and Weggeman (2001); and about relating culture back to personality as discussed in Part I, see Schwartz (1994; and important later work referred to in Vedina et al.). In sum, the rationale for the interlinkage between the three parts of the book is basically that one cannot start a techno-venture without the broader socio-economic context and the underlying culture of both oneself and others. This experience strongly suggests the option of cooperation, even if one prefers to be an *Einzelgänger*, given the need to survive. So the book brings the reader from the individual through his/her context to the culture and back again to the individual on the psychological level.

PART ONE: THE ROLE OF THE INDIVIDUAL VERSUS THAT OF THE INSTITUTION

Dominique Drillon

The previous section presented a wide variety of aspects that are to be considered when a framework or a conceptual model has to be discussed for a book dealing with the crucial aspects of emergence, cooperation and survival. So, when we approach these three main issues, individual, organizational and environmental or cultural factors have to be analysed. Consequently, Part I focuses on the individual and proposes chapters using a new psycho-analytic method to diagnose this with the emphasis on gender or profession (Ulijn et al. and Verhoeven et al.), embedded in the academic environment which may or may not act as a stimulant in the examples of Slovenia (Drnovšek et al.) and Northern Ireland (Brennan and McGowan). Chapter 1 focuses on the aspect of cooperation in the start-up context. Analysing a sample of 109 techno-starters located in five European countries (France, Germany, Sweden, Switzerland and the UK), this explanatory study uses quantitative methods to measure the impact of culture upon attitudes that may or may not predict cooperative behaviour. Chapter 2 explores new assessment methods in applying psycho-analytical and sociological approaches. In the example of a case study (Bradford), the authors are interested in the way cooperation between stakeholders affects the successful or unsuccessful start-up and sustainable performance of a

techno-venture. Chapter 3 gives a deeper insight of the institutional support environment for high-tech entrepreneurs in a transition economy (Slovenia). First, empirical data is mobilized to outline trends and evolution of technology entrepreneurship in Slovenia; second, the authors use survey data (questionnaires) to analyse the efficiency of incubator policy for high-tech venturing. In Chapter 4, the authors focus on the role that universities and academia can play to foster high-tech venturing, especially academic start-ups. From a theoretical perspective, this study explores the interaction between high-tech entrepreneurs and academic institutions and identifies different types of academic entrepreneurs.

In Chapter 1, 'The influence of national culture on cooperative attitudes in high-technology start-ups', by Jan Ulijn, Hans Frankort and Lorraine Uhlaner the main focus is the concept of cooperation by high-technology start-ups and in particular, the influence that culture may have upon attitudes that may predict cooperative behaviour. The research question is: what is the influence of national culture on cooperative attitudes within high-tech start-ups towards (potential) strategic partners, including partners from a different cultural background? The authors propose a definition and discuss past research on culture and economic behaviour. One interesting aspect in past research on national culture is the differing roles these characteristics may play in different phases in a firm's development. First, the authors stress the role of techno-ventures in the European economy and identify the challenges faced by high-tech start-ups. Then, to explore the relationship between culture and cooperation, the authors build a research model that tests a series of hypotheses for a better understanding of three cultural dimensions in high-tech start-ups: individualism, uncertainty avoidance and masculinity. This model is tested on a sample of 109 such start-ups representing 13 European countries and five different cultural clusters. The results point to a negative influence of individualism and masculinity on cooperative attitudes among the start-ups. No support was found for the effect of uncertainty avoidance. In addition, research results show a positive relationship between cross-functional experience and cooperative attitudes, as well as a sector effect. Manufacturers, for example, are not only more likely to report positive cooperative attitudes towards strategic partners but also more willing to acknowledge the value of strategic partners from a different cultural background. These latter findings emphasize the importance of professional and sector experience of individuals. Finally, the authors give some directions for future research. There is a need, for example, to link attitudes about cooperation to cooperative behaviours, to validate the importance of such attitudes more clearly. In the same spirit, other types of national cultural characteristics, such as

postmaterialism (Inglehart, 1997; Inglehart and Welzel, 2005) should also be further explored, and future research should not only focus on attitudes but also deepen the understanding of cooperative behaviours across firms and cultures. Finally, the authors present further implications for EU policy. Facilitating cooperation among firms, for example, is likely to become an increasingly important success factor for high-tech venturing in Europe. The authors also stress that the notion of cooperation, within and between cultural boundaries, is a more comfortable notion for high-tech entrepreneurship for certain countries (those with lower individualism and masculinity) than for others.

In Chapter 2, 'Entrepreneurship in a high-tech venture: psychological and social methods of survival assessment in the aerospace sector', Moniel Verhoeven, Dominique Drillon, Arjen Verhoeff and Jan Ulijn use a case study (Bradford) to analyse the survival and performance of high-tech ventures. New assessment methods based upon psycho-analytical and sociological approaches are used to understand the specificities of this company. The authors point out that it is not merely the technical figures in business development that are important, but also their ability to act as a community and use cooperation to develop their span of innovation. The research question focuses on the cooperation between stakeholders as a necessary condition for a successful start-up of a high-tech venture. In order to describe and analyse the Bradford community, the authors use the narrative approach. The analysis is executed by using two different approaches: the psycho-analytical method and the sociological approach to how communities work. For the psycho-analytical method, new insights are given into how brain functions can be related to cooperation. The sociological approach is based on Robert Nisbet's analysis of communities. The authors stress that in this way not only can the patterns of the individual entrepreneur or the orientations of the community as a whole be described, but also their interaction can be illustrated. The analysis of the Bradford case leads to insight into four basic relations. First, the relation between the (un)conscious motivation of the original founder/entrepreneur Ed Voeten and the current entrepreneurs, Raoul Voeten and Nico van Putten, and the expectations that the employees have developed from an intuitive way of working in a situation where differences in expectation over generations become visible. Second, for some 10 years the relation between those inside the company, who act as a community, has been based on trust within the family of insiders. Gradually this type of trust is changing into a kind of conditional trust over the various generations. Third, the relation between the working community towards the business environment is based on a sound mutual challenge. Fourth, the relation of the working community towards other sections of human society is of a

hybrid character. The management aims to combine profitability with societal spin-off, within a framework of small margins, while the personnel are struggling with the tensions caused by differences in belief systems at work and at home.

A tentative conclusion can be that cooperation between stakeholders is indeed a necessary condition for success in a high-tech venture. In the perspective of this conclusion, the authors have illustrated that the personal traits of the entrepreneur really are relevant to the development of a high-tech venture. A second and intuitive conclusion can be drawn regarding the method that is applied: both the Bradford directors have fully recognized the case description and have acknowledged the precision of the analysis of their personal leadership and the community of practice. Finally, the authors give a series of recommendations. First, cooperation can be seen as a powerful driver to enlarge the span of innovation of a company. A second guideline concerns the need in high-tech ventures to invest in the conditions that favour cooperation. Unlike high-tech 'gadgets' that can be bought immediately at a price, cooperation is a virtue that needs time to develop. Finally, not only can entrepreneurs themselves stimulate the abilities for survival, but also supervisors as well as individual employees play their own role and in this sense they are all part of the venture capital.

The aim of Chapter 3, 'Incubating technology entrepreneurship in Slovenia: do the nation's institutions foster cooperation?', by Mateja Drnovšek, Patricia Kotnik, Valentina Nahtigal, Janez Prašnikar and Aleš Vahčič, is to analyse the state of the art of technology entrepreneurship in Slovenia, which has been demonstrated as the key driver of the output effectiveness of innovation and knowledge clusters in developed Western economies. The authors present first results based upon the exploitation of empirical secondary data to illustrate the evolution and trends in technology entrepreneurship in Slovenia. First, they analyse the most important issues to outline the high-tech entrepreneurship landscape: technology transfer and spin-off firms; the role of high-tech venturing for knowledge transfer; the role of the support infrastructure; enterprise development in general and innovation and technology entrepreneurship in particular; firms' cooperation in the innovation process; cross-border cooperation in research and innovation. Second, the authors describe the development and the pillars of support infrastructure for technology entrepreneurship. Third, the case study of high-tech venturing in the Ljubljana Technology Park completes the empirical part with a qualitative description of the characteristics of the national innovation system, industrial policy measures for high-tech ventures and survey data based on interviews with high-tech spin-off entrepreneurs. The authors identify several obstacles

hampering the existence of an entrepreneurship support environment. First, in order to improve firms' absorptive capacity and their effectiveness in creating innovation output, the quality of human capital has to be enhanced and links with research institutions strengthened. Second, the government should rethink its financial support instruments for high-tech start-up companies. Third, public policies can only be effectively implemented if a social consensus attributing a greater value to entrepreneurship is achieved in the broader society. Finally, the authors argue that although Slovenia has created an extensive entrepreneurship-supportive environment in the last decade which at times even appears overinstitutionalized, its effectiveness will depend on the soft, culture-related determinants of the level of entrepreneurial activity.

Finally, in Chapter 4, 'The knowledge marketplace: understanding interaction at the academic–industry interface', Michael C. Brennan and Pauric McGowan focus on the role that universities and academia can play to promote high-tech venturing. The authors stress that understanding how high-tech entrepreneurs interact with academics and academic institutions is little understood. This is surprising given that such institutions are traditionally perceived as important generators of innovation through discipline-based, mode 1 knowledge production. In addition, such institutions are an important source of well-qualified employees for high-tech and knowledge-intensive firms. The focus of this chapter is at the level of an individual academic institution and the individuals who operate within that institution. The study is based on the premise that policy makers are changing how they view (and fund) such institutions. This change can be characterized as a movement away from perceiving academic institutions as linear suppliers of knowledge, to institutions as being part of a knowledge market. Such a view suggests that interaction between academics and high-tech firms is a complex and recursive phenomenon. The authors proceed in three stages: in-depth interviewing of university managers of innovation and academic entrepreneurs; development of a questionnaire, based on the key themes identified in stage 1; use of thematic characteristics as a practical tool in understanding the nature of academic entrepreneurs in three distinct groups. The key outcome of the study, from a theoretical perspective, is the identification of four types of academic entrepreneur: the hero, the maverick, the broker and the prospector. Each is distinguished on the basis of their relationship with the host university and the way in which they perceive discipline knowledge. For practitioners, both within universities and in high-tech firms, suggestions are made concerning how to interact and engage with academic entrepreneurs in practical ways.

PART TWO: THE ECONO-GEOGRAPHIC ASPECTS OF EMERGENCE, COOPERATION AND SURVIVAL

Frank Lasch

Entrepreneurship is a multidimensional phenomenon and needs to be explored from three main angles: individual, organizational and environmental (geography) factors. Part II focuses on the last point and deals with emergence, cooperation and sustainability from an econo-geographic viewpoint. It demonstrates the importance of considering different levels of analysis to provide a wide variety of findings. Consequently, the first chapter gives a holistic overview of one industry (the ICT sector) of a whole country (France at the aggregate level of labour market areas) and deals with the emergence of a whole industry. In particular, the issue of localization and environmental determinants affecting high-tech entrepreneurship is explored. A second theme of this chapter is sustainability, and it focuses on individual and organizational factors affecting successful organizational emergence. The second chapter uses similar methods (a quantitative, empirical-deductive approach based upon exhaustive secondary data), but deals with a particular type of entrepreneur (novice entrepreneurs) and explains why entrepreneurship activity varies within a region (Wallonia in Belgium). The third chapter differs in scope and method and uses qualitative methods to measure how cooperation and support for high-tech ventures affect successful entrepreneurship. The authors compare a Dutch agglomeration (Eindhoven) with the German Darmstadt region. The last chapter is a theoretical, descriptive contribution that gives a deeper insight into the European institutional context fostering competitiveness and cooperation from a transnational viewpoint, and explores how European economic policy can provide a useful framework for entrepreneurs. This chapter completes the previous academic insight into issues such as emergence, cooperation and sustainability from an institutional viewpoint given by a practitioner from the EU commission.

In Chapter 5, 'Emergence of high-tech ventures in France: how do regional, individual and organizational factors influence birth and sustainability of new firms?', Frank Lasch, Frédéric Le Roy and Saïd Yami present a holistic view of an emerging industry, the ICT sector, in France. Consequently this section is organized in a straightforward way. First, the authors note that the perception of this emerging industry is still incomplete for scholars and economic actors. In particular, the borders of the ICT sector are not clearly defined and the question 'what constitutes an ICT firm?' has to be answered. The definition-finding process has to be discussed in order to quantify the emergence of this young industry. Second,

the localization pattern of the industry reveals sharp regional disparities that raise the question ‘why are certain areas more attractive and entrepreneurial than others?’. Third, entrepreneurial opportunities in this emerging industry are linked to high risks and the authors analyse individual and organizational factors of survival.

This empirical chapter is based upon secondary data from the French Institute of Statistics and Economic Studies (INSEE). The dataset is exhaustive and encompasses all new firms founded over the observation period (85 500 firms). The authors use a quantitative approach and their period of observation covers nearly a decade, from 1993 to 2001, which corresponds to the emergence of the whole ICT industry. The aggregate level covers all 348 labour market areas of metropolitan France. In summary, this chapter can be characterized as an empirical multilevel approach, including spatial, individual and organizational variables that form a sort of a triangle framework in which entrepreneurship takes place.

In the first section, which deals with the definition of the industry, the authors give an overview of the definition-finding process over the last decade in France and, based upon what can be called a ‘consensual’ definition, analyse the quantitative growth and infra-sectoral structure of the ICT sector. The main finding for the first question is twofold. First, the ICT sector is dominated by small-sized organizations related to computer services; only one firm out of 10 belongs to the high-tech industry, which are mostly large firms. It is mainly the service branch that drives the growth of the ICT sector as a whole. Second, the structural analysis of the ICT sector reveals a strong heterogeneity with sharp differences between industry and service activities in terms of new-firm birth dynamics; additionally, the authors note that the sector is characterized by high firm birth rates, but the new firms are of a very small size at start-up.

The second section focuses on the relationship between the local socio-economic environment and entrepreneurship activity. The findings strongly support the thesis that geography matters even for so-called ‘footloose’ high-tech ventures. The major determinants are proximity effects and knowledge spillovers emanating from already existing ICT firms and the R&D infrastructure. Localization economies prime over agglomeration economies. Other determinants are population growth (increase of the potential of future entrepreneurs and growth of the local market) and the presence of large firms in the local context. These findings, obtained through an empirical deductive approach measured through multiple regression models, clearly show that knowledge transfer and formal or informal cooperation drives high-tech entrepreneurship.

The last section deals with the crucial question of sustainability. A high level of entrepreneurial activity in an area is worthless if the young firms

are not sustainable. Since sustainability is not only a matter of a favourable regional environment offering entrepreneurial opportunities, the authors analyse individual and organizational factors over a five-year period, using a cohort analysis on one firm out of five created in 1994 from the dataset. The main findings indicate that initial organizational factors such as firm size at start-up and financing prevail and affect survival more than the human capital of the entrepreneur. So the choices made for the initial organizational set-up are extremely crucial for high-tech ventures and may help to build predictive models of sustainability.

The contribution of this study for high-tech entrepreneurship research in Europe is manifold. First, the holistic approach to analyse one industry at a time offers a helpful insight into the structure and dynamics of an emerging sector. Second, from a practical viewpoint, the results represent findings on the critical issue of factors affecting entrepreneurship. Thus, the findings are useful for entrepreneurs themselves, practitioners, private or public support infrastructure (finance, government and so on) especially for crucial topics such as localization and sustainability of new firms. Finally, from a methodological viewpoint, the exhaustive dataset, the long time observation period and the fine-grained geographical aggregation level provide extremely robust results.

Chapter 6, 'Are human capital and culture the key factors in explaining intra-regional differences? Novice entrepreneurship and geo-cultural context in the Walloon region', by Vincent Calay, Jean-Luc Guyot and Gilles Van Hamme, focuses less on high-tech ventures but analyses a specific type of entrepreneur. The authors note that few studies in Europe deal with the transition from being a non-entrepreneur to being a novice entrepreneur. The authors explore the value of human capital and culture as explanatory key factors for entrepreneurship as a regionally differentiated process. These determinants are used to explain why certain areas in the Walloon region in Belgium are more entrepreneurial than others. The first section presents the theoretical framework and discusses the impact of different environmental features on entrepreneurship (institutional and economic context, facilities and infrastructure and cultural context). The main objective of this study is to identify infra-regional disparities in terms both of emergence (entrepreneurial activity) and of spatial determinants (human capital and culture). The second section discusses a specific analytical and methodological framework, the concept of principles of action. This concept provides a common interdisciplinary platform for scholars from sociology, geography and economics. This framework refers to the relationship between the agent in his/her strategic and historico-cultural constitution, on one hand, and the situation on the other. The main purpose of this concept is to transcend more 'classical' deterministic constructs.

The authors use exhaustive secondary data collected by the Wallonian governmental institutions. The data cover a three-year period and encompass all firms founded between June 1998 and May 2001 in the Wallonian region. From 12 748 firms, 3257 firms created by novice entrepreneurs were identified. A methodological specificity of this study is a double aggregate level approach on both the municipality and the labour market levels. The main reason for this choice is to enhance the robustness of the results, measured on two different aggregate levels. For the data processing, mainly principal components analysis is conducted.

The findings indicate that spatial diversity of novice entrepreneurship in Wallonia is strongly influenced by the socio-cultural and economic dimensions of the geographical context. The authors measure significant differences between an entrepreneurial Walloon Brabant and a southeast region with a less dynamic central belt. Within urban areas, core-periphery disparities are identified. Entrepreneurship is highest in areas with a high-qualified, high-income population. Areas with a lower-qualified population are less favourable for novice entrepreneurship. So, the emergence of novice entrepreneurship is strongly linked with the socio-economic level. Demographic variables such as age or matrimonial status seem not to affect novice entrepreneurship. In the same way, agglomeration effects (proxied by population density) seem not to have a determinant influence. Conforming to the results of the previous chapter, population growth characterizes entrepreneurial areas. Electoral behaviour, as a proxy for historical-cultural determinants, is found to affect novice entrepreneurship. Positive correlations are measured for centre-right voters and negative ones for socialist voters. In summary, novice entrepreneurship is strongly influenced by the socio-cultural and economic dimensions of the geographical context.

The contribution of this chapter to entrepreneurship research in Europe, in contrast to Chapter 5 (industry criteria analysing one sector), is to explore entrepreneurship based upon a type of entrepreneur criterion. The main finding is that local entrepreneurship as a crucial form of economic growth in a region is strongly influenced by the socio-cultural and economic dimensions of the geographical context. The study is an example of how entrepreneurship research can help regional governments to understand why certain territorial configurations are particularly favourable or unfavourable to novice entrepreneurship.

In Chapter 7, 'The importance of cooperation and support for technology start-ups: a comparison of the Eindhoven and Darmstadt areas', Johannes Halman, Jan Ulijn, Vareska van de Vrande and Frank Umbach show the results of a survey that was held among high-tech start-ups in the Eindhoven area in the south of the Netherlands and in the Darmstadt area in the west of Germany. The authors deal with the crucial topic of

cooperation between and support for high-tech ventures using the examples of a Dutch and a German agglomeration. Since the EU Lisbon agreement in 2000, technology-based start-ups in European regions can count on big support. Although cooperation and networks are needed, the question remains as to what extent this kind of support or cooperation really helps and whether or not it is appreciated by techno-starters.

First, the authors made a pre-selection of potential technology start-ups by using the European classification system (NACE; the same classification as that used in Chapter 5). Only companies that were founded during the last five years were considered in order to meet the overall focus of the book – ‘emergence’. Second, the authors proceed with a qualitative approach based upon a telephone enquiry among 86 companies in Eindhoven and 21 in Darmstadt. The enquiry followed a pre-structured protocol by means of a questionnaire which included topics such as characteristics of the company; support received or desired in the future; considerations for starting a business in the local geographical context; problems experienced; and characteristics of the entrepreneur.

The results show that about 50 per cent of the respondents are currently cooperating with other start-ups, whereas more than 90 per cent indicate that they can imagine cooperating with other start-ups in the future. Of the technology start-ups that currently cooperate with others, the majority do so in R&D. The results also indicate that many high-tech starters currently receive no or very limited support from governmental or other institutions. However, the results also indicate that the attitude towards support in the Darmstadt region is somewhat different from that in the Eindhoven region. The respondents in the Eindhoven study claimed that they did not desire any support in the future either, whereas the respondents in the Darmstadt study indicated that they would like to get more support in the future. In addition, the study shows a positive attitude among the majority of the technology start-ups towards cooperating with other start-ups, both nationally and internationally.

The contribution of this study to entrepreneurship research in Europe is to demonstrate how, for the same type of firm, high-tech companies selected on the same criteria and interviewed with the same questionnaire, attitudes towards support may be linked to national or cultural factors. In both the Dutch and the German context, the findings for cooperation, were similar and give strong support for the crucial importance of cooperation for successful high-tech venturing.

In Chapter 8, ‘European territorial cooperation to improve competitiveness in the Union: the case of EU-funded cooperation in Central and Southeastern Europe’, Ulrich Graute provides a snapshot of the institutional context the European Commission offers for entrepreneurs and is

focused on the macro level of European cooperation as a framework to improve EU competitiveness against a background of cohesion policy. The author provides a detailed insight into the EU funding programmes which are often perceived by entrepreneurs and local economic actors as a veritable 'jungle' offering strong and various support, but only for those economic actors who are able to explore its complexity in order to identify opportunities matching to their projects. The objective of this chapter is to give a brief overview of the history of European integration, which in the past focused on two main issues: fostering economic competitiveness and reducing spatial disparities. The chapter features particularly the new emerging field of European territorial cooperation, described as a mainly actor-centred institutionalism. The author argues that the specific role of private actors is a rarely analysed issue in a context where policies related to the development of the EU territory are dominated by the public sector. Consequently, this chapter deals with the following questions: how can small-sized entrepreneurship and SMEs contribute and benefit from transnational cooperation in the field of EU cohesion policy? How do public actors handle the challenge to promote competitiveness and at the same time support a balanced, sustainable development of the territory? The chapter ends with a synopsis on the achievements so far and the perspectives for the future.

The intention of the author is to provide a critical discussion of the current situation in order to provide descriptions, and to facilitate further research on the development of the cooperation of public and private actors. The first section of this chapter explains the European policy framework and deals with three topics: EU cohesion policy fostering competitiveness and sustainability, territorial cooperation to strengthen economic and social cohesion, and, finally participation in European territorial cooperation. The second section draws first lessons from territorial cooperation and points out the limited opportunities for enterprises interested in territorial development especially in the last decade. The author argues that since the late 1990s, awareness of the territorial dimension has emerged and demonstrates in the following section how cooperation takes place in the framework of the INTERREG programme for transnational cooperation. The importance of cooperation is displayed by the growth of partners involved in the approved projects: the number rises from 211 for the first period of 1997 to 1999 up to nearly 1600 in spring 2006!

This study points out that when actors talk about the Lisbon objective, in European territorial cooperation, they primarily mean competitiveness of the regions. Indeed, it is difficult to harmonize rapidly changing economic conditions in a globalizing world with an integrated and long-term coordination of territorial development, but this is precisely the challenge that has to be faced.

PART THREE: THE CULTURAL LEVELS OF NATION, GENDER, PROFESSION, SECTOR AND REGION IN EMERGENCE, COOPERATION AND SURVIVAL

Jan Ulijn

This part builds further on Parts I and II – through its four chapters it will also focus on NC, PC, sector and region. Gender is not dealt with specifically, but there is some reference to family culture, where the start-up often takes place, as a natural source of cooperation and teamwork with respect to future research. This part ends with a return to the issues in Part I, by describing some skills and values of the individual in his/her decision as to whether to look for cooperation or not. Two chapters from the University of Twente (NL) present case studies which build upon social network theory and the capitals/resources issue. Although no exhaustive attempt can be made here to cope with the extensive literature and to define all the different varieties, we shall try to come to some positioning of the three main ones for cooperation between start-ups as a means of survival: human as related to Part I, socio-economical in a broad sense as linked to Part II and cultural in Part III, mainly based on Bourdieu (1986; see also Coviello and Jones, 2004, CJ below; Koen, 2005; Subramaniam and Youndt, 2005, SY below). The classic iceberg analogy (Ulijn and St. Amant, 2000) allows us to range the different capitals which are distinguished in the literature in some order, from the ‘hard’, visible explicit factors at the top to the ‘soft’ invisible, implicit ones under the sea at the bottom. The soft ones at the bottom are as hard, but largely overlooked as a predominant layer – which also applies in the case of the emergence, survival, growth and maturity of techno-ventures. The order, then, is as follows with respective sources for definitions: technical, financial and economic (Wakkee et al.), strategic (Wakkee et al.), organizational (Kirwan et al.; Wakkee et al.; and SY), network capital (for a definition, see Kirwan et al.) and intellectual capital, being at sea level (the number of patents above, for instance, as a result of the cognitive skills of engineers and scientists), human (Calay et al.; and SY/CJ), social (Wakkee et al., its references and SY/CJ) and cultural. Cultural capital is defined as related to connections in cultural patterns such as value and norm systems, and also to knowledge necessary to maintain (or change) the patterns of behaviour (Bourdieu, 1986: 42). There is a good link with innovativeness and entrepreneurship under the sea, through human and social capitals. Human capital involves the entrepreneur’s innovativeness, tolerance for ambiguity/flexibility, commitment and need for achievement; also his/her general perception of risk (tolerance), entrepreneurial and management competence, international

experience, education and language proficiency (from Coviello and Jones, 2004). Social capital involves the entrepreneur's proprietary network relationships, such as communication/social networks and informal contacts (from Coviello and Jones, 2004; see also Kim and Aldrich, 2005). The other two chapters in Part III relate to Slovenia (Prašnikar et al.) with a professional culture comparison, which Wakkee et al. also provide, and Estonia (Vedina et al.), which is also included in Kirwan et al., and brings us back to value diversity on the individual level with respect to innovativeness, entrepreneurship and cooperation. As stated earlier, European region/country effects are discussed in Drnovšek et al., Graute and again here in all chapters. Finally the effect of sector cooperation is mostly felt in ICT (Lasch et al., Kirwan et al. and Prašnikar et al.), supplemented by nano-, bio- and laser technology (Kirwan et al.). Ulijn et al. also deal somewhat with the culture of the sector (services or not) – partner dissimilarity is more easily accepted in services.

In Chapter 9, 'High-tech start-ups and innovation journeys: strategic shifts, culture and networks', Ingrid Wakkee, Aard Groen and Reinier Heerink explore the link between innovation (journeys), entrepreneurship, opportunities and social networking. How do technology-based start-ups use social networking to create value by the pursuit of different opportunities for business derived from a single technological breakthrough? In particular, how do entrepreneurs manage tensions between conflicting demands of maintaining operational effectiveness and strategic flexibility? To that end the authors develop a framework for analysis that distinguishes between four managerial mechanisms (goal attainment, optimization, pattern maintenance and social networking) and shows what capitals are involved in these mechanisms in relation to the development of operational effectiveness and strategic flexibility. Two case studies are then presented in which the authors explore the relationships empirically. The cases provide evidence of how high-technology start-ups can use networks in different ways to pursue opportunities: either they enter different networks and let the dynamics lead them to the recognition of new opportunities or they build and develop their networks such that they can exploit the recognized opportunity optimally in a way that best fits their emerging culture. The authors discuss how the occupational background (scientific versus business) and orientation (science versus market) of the founder, that is, the professional culture, might have affected the process. From a managerial perspective, the framework developed in this chapter enables managers to justify claims on particular resources and their dedication to specific activities. The network strategies adopted by the entrepreneurs can be used by managers as an example of how they can reach their goals in a way that best fits their professional culture and the emerging culture of their business. Finally, this

study should make managers aware of the importance of taking into consideration other organizations, involved in the same or related innovation journeys, when engaging in social networking and developing social capital.

This study not only substantiates the network dealings of two technologies over a couple of years in a longitudinal sense, but also links survival to a given professional and emerging corporate culture. It is striking that one case (Sound Inc. on a flow sensor for liquids), build up their network, while evolving in their venture, whereas the Motion Inc. case (developing a runner's watch) uses upfront a network of different capitals in their innovation journey, including the alliance with a German multinational. Motion was looking for cooperation with a potential market immediately after combining two types out of the four identified by Jones-Evans (1995), the researcher and the opportunist or the technician, very close to the inventor profile and the manager close to the innovator in the typology by Fayolle et al. (2005). Sound was more technology driven, and the researcher remained in that capacity for a longer time. Ultimately both PCs of engineering merged with a marketing culture.

In Chapter 10, 'Making the transition from entrepreneurial to professional management in small and medium-sized ICT businesses in Slovenia and Germany', Janez Prašnikar, Karl-Heinz Rau, Marko Pahor and Monika Klinar present a study of the transition from entrepreneurial to professional management in high-tech organizations in three Slovenian and three German ICT firms. This transition is characterized by the functional specialization of top and middle managers, the increased formalization of decision making, the formalization of communication, originating delegation of decision making and trust that the agreed tasks will be performed at all levels. Companies are starting to develop their employees through further education and a formal system of planning and control is being established. Interestingly, there is less stress on performing tasks according to formal job descriptions and respect for the rules. Their analysis, performed on data from 121 interviews, found no substantial differences in the transition from entrepreneurial to professional management between six companies from different ICT subsectors from Germany and Slovenia and firms from other industries. They noticed, however, a greater rigidity of German engineers in performing tasks according to their formal job descriptions, probably a consequence of the cultural environment.

As discussed earlier, the findings seem to suggest that a possible ICT sector culture effect seems to override that of PC. Whereas at the stage of growth and maturity the study by Ulijn et al. (2001) indicates that German firms need to become more entrepreneurial instead of 'just' managing their business (compared with Dutch ones), this German–Slovenian comparison shows a remarkable similarity between the two samples: entrepreneurial

culture is well suited to the initiation stage of innovation, whereas professional management in a collective mood warrants an efficient implementation. Similar commonalities are found at the start-up stage between 627 Austrian and 778 Czech ventures, in addition to the Czech characteristics of a young economy (Mugler and Kessler, 2004). Since this study, both the start-up and the maturity phases of a firm by two five-year-old technostarters in the Slovenian sample and four firms older than 13 years (one in Slovenia and all three in Germany), indicate that cooperation continues to be an asset throughout the development of a firm.

In Chapter 11, 'Value diversity for innovativeness in the multicultural society of Estonia', Rebekka Vedina, Gerhard Fink and Maja Vadi offer a closer look at what values are important for entrepreneurs for providing the ground for innovation and suggest a way in which they can be combined to achieve better cooperation. The potential for entrepreneurship in Estonia stems from value diversity.

The values of the two major cultural groups, Estonians and Russian speakers, are studied. Their hypothetical impact on innovativeness and cooperativeness is discussed and implications are drawn for managers. The importance of values related to innovativeness was found to differ in these two groups, which suggests that their representatives could play different roles in the different stages of the innovation process. The presence of complementary group cultures is important for cooperation in entrepreneurship in order to combine advantages in the early stages of innovation with those in the later ones. It can be concluded that the cultural basis for innovation is provided by a large part of Estonian society, whereas the other part complements it with capabilities for implementing the innovative ideas. Shared values among Estonians and Russian speakers, such as being honest and logical and aiming at high self-respect and a sense of accomplishment, will provide sufficient ground for cohesion among the members from the different population groups. Values such as being courageous and imaginative may be brought into innovative groups from Russian speakers while the instrumental value of being capable may rather be supplemented by the members of the Estonian population group. This shows that cohesion and diversity between the cultures of the major population groups may enhance the repertoire of values for initiation of innovation. A successful cooperation between the people with diverse cultural values thus brings further advantages for entrepreneurship. Knowledge and awareness of one's own and one's partners' values can be an important asset for establishing successful partnerships in the new business development.

Are new EU member states, such as Slovenia and Estonia, better implementers of innovation than initiators of it? Whereas the previous chapter seems to illustrate that mature Slovenian firms developed a collective imple-

mentation culture as similar to the Germans, this chapter demonstrates (using Rokeach instrumental and terminal values) that Estonians may importantly add to values that are considered as a requirement for the implementation of innovation. Russians may strongly enhance the capabilities for initiation of innovation. Here we have an example of the ethnic entrepreneurship in which human capital has strong ties with the start-up phase which become weaker at the stage of growth (Stiles and Galbraith, 2004; also for links with social capital in the United States, Canada and New Zealand). As Inglehart shows on the basis of his data for Estonia, this country is moving rapidly from the traditional to the rational, still refraining from too much self-expression, which is a characteristic of the Northwest European regions. The method which is used in this chapter clearly goes beyond Hofstede's work, since it strongly draws from the psychology of the individual business starter having to opt for cooperativeness and innovativeness. It might even give an opportunity to update Schwartz's original work of 1994 for 38 cultures for related values.

In sum, what other relevant aspects can be addressed? In particular the studies of entrepreneurship in former socialist societies show that even before communist rule, the family was an important source of new business development in which the role of the woman was crucial (Gundry et al., 2002). Cooperation and teamwork developed naturally, but is this possible, for instance in techno-ventures, where technology demands a specific educational background which might be not available for each family member? If the founder of such a venture is a woman, then as a scientist or an engineer she might be more inclined towards cooperativeness. Are women keener on this, because of their higher affiliation value than men who are more competitive? Do engineers who are used to working with project teams do a better job than selfish scientists who seek the glory of a Nobel Prize? Is it also a matter of professional cultural difference? In addition, women often also display intuition, as part of their female emotional intelligence (see the exploratory study of perceptions and experiences by Kakkonen, 2005 on how this intuition translates into family entrepreneurship and Verheul et al., 2001 and 2002 on how women's self-image might be more entrepreneurial). There are not enough female start-ups in the EU and those that do exist are mostly in services, to be combined more easily with family and childcare. The positive image of the female entrepreneur is that she can be a good relationship builder, she controls costs better, hires fewer personnel, but also takes less risks. Family cultures in entrepreneurship provide a type of transformational leader, rooted in Confucianism in mainland and overseas Chinese that can be very effective (Wah, 2004); the Bradford company analysed in Chapter 2 is a Dutch example of this.

In Chapter 12, 'Early-stage networking: how entrepreneurs use their social capital to establish and develop high-technology start-ups', Paul

Kirwan, Peter van de Sijde and Aard Groen investigate the early-stage networking activities of high-technology start-ups. How do the entrepreneurs drive these firms to utilize their networks to accumulate the necessary resources from the initial period prior to the firms' foundation right through to their successful emergence and early growth? To answer this question an entrepreneurship in networks (EiN) model depicts the entrepreneur, acting in a social system, who needs to accumulate four types of 'capital' (economic, strategic, cultural and social) to establish and develop the venture. This follows an entrepreneurial process, from opportunity recognition, through opportunity preparation, leading to opportunity exploitation, all the while creating value for the firm. Using this model, the early-stage networking activities of 22 high-technology start-ups are examined, highlighting the differences pre- and post-foundation. A specific case illustration is given to further demonstrate how these early networking activities enable the entrepreneur to establish and develop the firm. Finally some European regions are compared with respect to the differences in regional support for these firms. The cases emphasize the importance of a key partner to the development of high-technology start-ups and the perceived inadequacies in the regions for supporting these firms.

The six UK (Warwick and Cardiff) start-ups enjoyed mainly economic capital support in pre- and post-foundation stages of the start-up, in the Netherlands (Twente) and Belgium (Leuven) the capital support became mainly economic, cultural and strategic in this order after the foundation, whereas in Estonia (four start-ups from the University of Tartu) the support remained strategic, both before and after the foundation stage. Hence, culture seemed to be not that important after all. This chapter contributes to the emergence process as an important element in using different capitals as a form of cooperation and support, so the study operates longitudinally, but social network theory has not yet been tested sufficiently to a controllable level throughout those cases to prove a relative unimportance of the effect of culture on cooperation modes of techno-ventures, let alone the cooperation between them.

CONCLUSIONS AND POSSIBLE FUTURE RESEARCH

Jan Ulijn

How can cooperation help more high-tech ventures in Europe to emerge and survive? This book has made a start to signal how techno-starters could cooperate across the borders of old and new member states, not only at the emergence and survival stages, but also at the growth and maturity levels.

Moreover, it has provided some ingredients for a comprehensive model or theory which is needed to see how a general European innovation and entrepreneurial culture could develop across the borders of nation, region, profession, sector and gender (compare the national, professional and sectoral cultures: NC, PC and SC). The social network and ‘capitals’ theories are promising elements. This then might ‘automatically’ lead to more cooperation at the emergence and survival phases of techno-ventures, in which the initiation and implementation stages have to be clearly distinguished: there is nothing more practical than a good theory! As part of this culture, the technopreneur has to develop skills and values not only at the collective level of a national, professional or sectoral culture, but also at the individual one to foster this cooperation. The theoretical contribution of the book here is to bring culture and psychology together in this particular context of the nascent technopreneur.

An important question for government policy makers at any level – EU, individual member state, province, region (Euroregion) or city – is to know how cooperation between techno-ventures should materialize and whether it happens often enough. EU integration could support cooperation across NC, PC and SC borders, as the SURVIE programme shows. In this sense a framework, such as that presented in Ulijn et al. (ch. 1) might be useful, at least for national culture. Is high cooperation propensity and acceptance of culturally dissimilar partners the ideal for the emergence and survival of techno-starters? It seems likely. Finland and Slovenia, then, are examples for the other member states to follow, at least according to the results of this pilot study. Apart from the above cultural EU member state benchmarking, the following lessons can be drawn from this book:

- Be careful with support; give only the one the techno-starter really asks for. Do not overincubate the baby in the cradle!
- Symbiotic and not competitive entrepreneurship might be the solution for Europe, but clearly embedded in a strong relation between (technological) innovation and entrepreneurship.
- The EU should learn from the US (and the UK) that risk taking should be encouraged.
- European innovative and entrepreneurial culture should not only use its (hidden) Christian values, but also the upcoming Confucian and Islamic ones as part of the above symbiosis and cooperation.

Which Research Methods?

How should future research back up this process of growing cooperation between techno-ventures in Europe? We shall review the following elements

with regard to research methods, a more institutionalized form of cooperation, strategic alliances and so on.

To sum up: the review has to be modest because only some case studies and narrative approaches could be presented together with some statistical reviews (mostly in Part II) and one hypothesis testing survey (Ulijn et al.). With regard to the question: ‘can cooperation between techno-ventures help them to survive?’, a theoretical framework still has to be developed to give an acceptable answer. This book may only illustrate and not prove that cooperation makes a difference in the survival of techno-starters and their ventures. Techno-starters may well prefer to start their own ventures, as discussed previously on pages 22 and 23 of this chapter, however we were unable to find any proof that this would lead to sustainable results in the long-run. As noted earlier, a conceptual model of cooperation between techno-ventures, should account for the following, in a longitudinal perspective:

- Possible factors of the effect on cooperation among high-tech start-ups at a given stage, pre-foundation, emergence, survival, growth and maturity, as is specified in the particular chapters of this book.
- Cooperation, support and skills of techno-starters are needed throughout the life cycle from a longitudinal perspective, where the survival/growth limit has been defined as approximately 6–10 years of age of the start-up.
- The ‘model’ should include the effect of cooperation (or not) on the survival of the start-up at the upper age limit, as an independent variable for which to control.

Teamwork and Strategic Alliances

The longitudinal research method proposed by Davidsson (2006) with 17 specific propositions on the basis of some 75 studies might also be a workable approach with regard to cooperation. A stage beyond the mere intention to cooperate is teamwork, for which Ancona and Caldwell (1998) rethink its composition from the outside in. This is an interesting perspective since most teams, also in new businesses, start with a family, or a group of friends or colleagues, and so on, whereas the technological knowledge and market economies need an outside perspective for techno-ventures to survive. A benchmark of 20 Italian start-ups with five British, five Dutch and 24 German ones by Ulijn et al. (forthcoming) concludes that cooperating in technology start-ups is not only a local, but also a European entrepreneurship challenge. Different NCs take different perspectives: Germans see the advantage of team versatility; Italians prefer the ‘family’ setting; the English and Dutch prefer individualistic

approaches, although they see the usefulness of the team approach. Perhaps they are less capable of teaming up naturally right from the start of the venture, given the finding of Chapter 1 that the Dutch sample of 37 start-ups disclosed a low acceptance of partner dissimilarity with a high cooperation level. At the growth and maturity levels, cooperation is often organized into institutionalized forms, such as strategic alliances (SAs), joint ventures, mergers and even acquisitions, particularly relevant for the above technological sectors mentioned hereafter. It is also important to research the dissolution procedures of such endeavours. How should cooperation be terminated in a businesslike way? We come here to the final step of the classic team development: forming, storming, norming, performing and adjourning. As far as we know, SAs are seldom seen in a historical way from the inception stage of a firm. Cooperation culture can also be studied in this way to predict possible hurdles of collaboration between businesses and individuals.

With Respect to Europe and Its Regions

Europe in general is the link between (technological) innovation and entrepreneurship as it is also embedded in the culture and skills needed of the (future) techno-starter or intrapreneur within a large R&D department of an MNC or government body, for instance. EU policy makers have problems with clearly linking up entrepreneurship and intrapreneurship with new business development. Initiatives are taken such as those described in the Pan-European Gazelles project through one single entrepreneurial and cross-cultural space (Wilson and Twaalfhoven, 2005), but do they lead to more cooperation across professional and sectoral borders? Oversupport and regulation should be avoided. What are the needs of techno-ventures themselves? If one looks at the recent Europe INNOVA initiative (European innovation, December 2005) as a clear stage in the implementation of the Lisbon agreement, the focus is very much on the assessment of innovation performance and exchange of good practice in networks by industrial sectors and clusters. Future studies about cooperation between and by European techno-ventures should also include more detailed professional and sector culture effect assessment, in particular in some specialized science and technology sectors, such as biotech, aerospace or environment care, to see how they constitute a major step in making Europe the most competitive knowledge market by 2010. Part of it is the cooperation between Euroregions, as described in Graute (ch. 8) and for regions, such as southeast Netherlands with nearby Belgium and Germany (Eindhoven–Leuven–Aachen) as the technological brainport of that EU region and the Baltic Sea region bringing other Nordic, Germanic and

Balto-Slavic countries and cultures together. Those European elements of cooperation should be part of a solid research agenda.

What Culture and Skills Research Is Required for Collaboration for Technopreneurs: Techno-starters or Intrapreneurs?

Following the groundbreaking work by Triandis (see Kim et al., 1994) collectivistic attitudes might be tested in techno-starters, as a logical step beyond the pilot study by Ulijn et al. (ch. 1), which itself needs a careful and comprehensive replication. Both Bierbrauer et al. (1994) and Chan (1994) propose psychometrically sound methods of measurement of cultural orientation scales of individualistic and collectivistic orientations which can be used in techno-ventures to diagnose a possible lack of cultural cooperation skills at the survival level. As mentioned before, a techno-starter also has a history of cooperation – perhaps in a previous R&D job, his/her firm might be a spin-off. Some 67 per cent of Europeans think that science and technology play an important role in industrial development and around 50 per cent think that Europe is lagging behind the US with respect to scientific discoveries, education of scientists and application of technological advances to industry (S&T Eurobarometer in *RTD info*, 2005). Hence technology entre- and intrapreneurs are badly needed. An open innovation space of public and private R&D in Europe, perhaps linked up with the new initiative of a virtual European Institute of Technology combining its main campuses, could act as a techno-venture cradle not only for Europe, but also for other parts of the world.

To create much more successful ventures, the intrapreneurship which is needed has to be studied in more detail, along with the relevant skills (see Wai-chung Yeung, 2002 for the skills of transnational entre- and intrapreneurs; and Menzel, 2007 for skills needed by technology intrapreneurs). The intrapreneur characteristics in those studies differ from Shell's HAIRL model: helicopter view, analytical skills, imagination, realistic bottom line, and leadership, in this order of priority (see Ulijn and Fayolle, 2004): vision and ambition come first in China. The list cited earlier (creativity, drive, empathy and persistence at the start-up, courage and risk orientation, ability to reflect, strategic orientation and leadership and communication) together with reliability and decisiveness, and personal values that subsist at the maturity level (reliability, decisiveness, persistence and determination) overlaps with 14 items of intrapreneur characteristics, for which we suggest a decreasing order of priority, still to be tested:

- vision and creativity;
- initiative;

- internal motivation (see Chinese innovative culture);
- autonomy;
- risk taking;
- internal control;
- commitment and persistence;
- market knowledge/customer orientation;
- knowledge of organizational structures and willingness to cross functional borders;
- hands-on attitude and ability to make rapid decisions under uncertainty;
- self-confidence and willingness to learn from failure;
- leadership;
- team play and motivation; and
- communication skills.

The above list is seen from the individual's level. The cultural perspective from the group/corporate perspective overlaps (seven items):

- vision and creativity;
- tolerance for risk;
- tolerance for failure;
- support by top-management, sponsors and mentors;
- recognition of small contributions;
- mutual trust and confidence, superordinate goals; and
- expectation of excellence, high standards of performance.

Amazingly, all these skills have in common that they are poor on items that relate to the other party/person or cooperation. A few exceptions are: leadership, communication, empathy, customer orientation, team play and motivation, support by top-management, sponsors and mentors and recognition of small contributions. So, engineering education and training, both academically and on the job, might have an important task in such skills development. Entrepreneurship is not the same as intrapreneurship. Schumpeter had already included individuals inside corporations in his concept of entrepreneurship (see Schumpeter's definition on page 12. Intrapreneurship indicates a serial or recurring as a source of innovation for corporations: 'Intrapreneurship denominates episodically recurring processes by which individuals inside organizations pursue opportunities without regard to the alienable resources they currently control'. In a longitudinal perspective, cooperation also needs to be studied before the techno-ventures emerge, that is in the R&D environment where intrapreneurship should be available. How does this kind of skill and culture

assessment lead to a change of behaviour, if this is necessary to make for the survival of techno-ventures? With regard to intrapreneurship, Menzel (2007) offers a scenario-based simulation process which might contribute to this, one of the possible options being to become a techno-starter after working for some time in a large R&D facility. The question is whether to stay in the company or leave it, and how? More studies in this vein might suggest how behaviour can become more cooperative. At the other end, the social and economic context of the techno-starter might also make or break his/her success. In the studies reported in this book it was not always easy to make the right distinction between the individual and his/her context (Parts I and II); there is a lot of overlap.

Repeatedly we have said that this book should not be overambitious: the picture of cooperation between techno-ventures and -starters in Europe is too kaleidoscopic in this respect with regard to distribution over countries, regions, professions, sections and gender. We could not prove anything, but merely illustrate, often using barely comparable case studies, but nevertheless there were some prudent attempts to obtain empirical evidence plus some econometric/sociological/survey-based studies, and the narrative approach proposed in Chapter 3 seems promising. The authors hope to have given at least some insight and awareness into the process of cooperation across the cultural levels of nation, gender, profession, sector and region in the emergence and survival of techno-ventures in Europe.

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