CROSSROADS OF ENTREPRENEURSHIP

Edited by
Guido Corbetta
Morten Huse
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CROSSROADS OF ENTREPRENEURSHIP

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CROSSROADS OF ENTREPRENEURSHIP RESEARCH: AN INTRODUCTION

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1. A CONVERSATION ACROSS DISCIPLINARY BOUNDARIES

On September 26th to 28th 2002, we organized a conference in Milan to celebrate the centennial of Bocconi University. The conference — *The New Frontiers of Entrepreneurship* — brought together people actively engaged in improving our knowledge of entrepreneurial activity, and in diffusing it through their corporations or institutions. Economists, business historians and management scholars from pre-eminent Italian and foreign institutions of higher learning presented and discussed issues at the forefront of research in entrepreneurship. Key issues addressed in presentations and discussions included: How do social and institutional contexts promote or hinder entrepreneurial activity? How is technology reshaping the conditions of entrepreneurial action? How do financial systems and institutions selectively and effectively support entrepreneurial ventures? How can entrepreneurial action be fostered in established firms or hostile environments? How does governance affect entrepreneurial action? In the end, a panel of members of the political, financial and business communities was asked to comment on the research findings in light of their practical experience, and to bring their views on changing patterns of entrepreneurship in firms and regions.

This book brings together a selection of the papers presented at the conference and a synthesis of the final roundtable discussion. The title of the book — *Crossroads of Entrepreneurship* — reflects the spirit of the conference: a gathering of scholars and practitioners of diverse background sharing an interest in the process of entrepreneurial wealth-creation; a meeting place where different perspectives, traditions and paradigms could engage in mutually enriching conversation. In this respect, Italy seemed to us a natural venue for such a conference. Geographically located in the middle of the Mediterranean Sea, throughout the centuries the Italian peninsula attracted settlements of Greeks, Gauls, Goths, Normans, Arabs, and other populations who left their trace in local architecture, languages and traditions. Venetian, Genoan and Florentine merchants established trade

relationships with distant lands, reaching the rest of Europe, Northern Africa and even China. When caravans returned from their journeys, they brought back not only spices and brocades, but also knowledge and awareness of different peoples and ways of living. Later, the temporary domination of the Spanish, French and Austrian empires in different parts of Italy further influenced the evolution of culture and institutions. More recently, Italy has transformed itself from a land of emigration, such as it was at the turn of the 19th century, to a land of immigration. Growing communities from African, Asian and Eastern European countries are gaining increasing influence in the social and cultural environment of large and small urban areas, turning Italy once again into a meeting place of cultures and traditions.

In line with the spirit of the conference, this book hosts contributions from scholars addressing different issues and belonging to different disciplines — including business history, economics, sociology, and management. Rather than focusing on issues or paradigms, however, we have chosen to arrange contributions in sections, with the aim of emphasizing dialogue across disciplines and paradigms, rather than boundaries between them. A second reading of the contributions revealed new and diverse themes, which will be briefly highlighted at the end of this introductory chapter. We took the convergence of issues and interests as a healthy symptom that, despite paradigmatic differences, there is space for discussion across disciplines. The high number of cross-citations between disciplines — sociologists citing economist, economists citing business historians, etc. — and common references to people such as Joseph Schumpeter, William Baumol, Alfred Chandler, Giacomo Becattini or Howard Aldrich, seems to be a further indication that a fruitful conversation is already taking place, perhaps more so than in other disciplines of the social sciences.

In the following paragraphs, we will first describe the historic and academic context of the entrepreneurship field, as well as the social, cultural and institutional environment in which the conference and this book developed. Next, we will discuss the content of each section. Finally, we will synthesize key themes and issues emerging across disciplinary boundaries, discussing their relevance for current research and practice in the field of entrepreneurship.

2. CROSSROADS OF ENTREPRENEURSHIP RESEARCH

2.1 The roads leading in: The intellectual traditions of entrepreneurship across the social sciences

What do we mean by entrepreneurship? Entrepreneurship today is defined and understood in various ways. Several roads lead to understanding entrepreneurship, and possibly to more roads or future paths of the concept.

The entrepreneurship concept comes from the French word *entreprendre,* which means to undertake something. Richard Cantillon (1680-1734) and Jean Baptiste Say (1767-1832) were among the first economists to give entrepreneurship its risk taking content (Landström 1999). The early understanding of entrepreneurship was followed by the traditions dominated by the Austrian school and the work of Joseph Schumpeter (1883-1950). Carl Menger (1840-1921) was a founder of the Austrian tradition of economic thought. He was a proponent of methodological individualism, seeing economic activity as a result of individuals' actions.

In a market economy no individual has full information on the market, and entrepreneurship in this tradition is a question of correctly anticipating the market, and identifying and dealing with opportunities (Hayek, 1945; Kirzner, 1973; Mises, 1951). Schumpeter's perspective was that of innovation rather than exploration as in the Austrian tradition. While the Austrian tradition considers entrepreneurial behavior as exploring market disequilibria, the Schumpeterian tradition emphasizes the creation of market disequilibria (Baumol, 1968; Schumpeter, 1934, 1942). The crossroads of these three classic traditions leads us to an understanding of entrepreneurship as risk-taking, proactiveness and innovativeness.

During the late part of last century entrepreneurship also received interest from scholars in disciplines other than economics, e.g. from behavioral science and management. David McClelland was a pioneer among behavioral scientists. He built on Max Weber's work on Protestant Ethics and the Spirit of Capitalism and asked why some societies become more dynamic than others (McClelland, 1961). He concluded that countries that are economically better developed are characterized by people who have a high need for achievement.

Entrepreneurs are people with a high need for achievement, strong self-confidence, and independent problem-solving skills. McClelland's contribution led to further research among behavioral scientists on how personal qualities and characteristics of the entrepreneur differed from those of other people. For behavioral scientists it also became interesting to identify different categories of entrepreneurs (Collins, Moore and Unwalla, 1964; Smith, 1967).

In 1979 David Birch presented his report *The Job Generation Process* (Birch, 1979).

The report was a spin off from his studies of big cities. Cities and their problems were the focus of attention in the USA in the post Vietnam period, and Birch was asked to study what created jobs in cities. His conclusions about the role of entrepreneurship and rapidly growing firms received enormous attention, and entrepreneurship was then placed on the agenda of governments and policymakers in major countries in America and Europe. William Gartner (Gartner, 1985, 1988) is another scholar in the management tradition who redirected the research focus on entrepreneurship from "who are entrepreneurs?" to "how are new organizations created?" Gartner used an organizational emergence approach stemming from a life cycle model in which entrepreneurship is the initial phase.

Entrepreneurship has also been studied from a strategic management perspective as firm behavior in existing organizations (Block and MacMillan, 1993; Covin and Slevin, 1991; Kanter, 1986). Main elements in this approach have been entrepreneurial posture and value creation through product, process and organizational innovations as well as market venturing.

2.2 The intersection: The academic context of entrepreneurship

Meeting places for entrepreneurship scholars are emerging. The number of journals publishing entrepreneurship research is growing quickly. The same is happening to the number of educational programs and chairs in entrepreneurship at colleges and universities.

Several authors have contributed to the emerging infrastructure for entrepreneurship research.

Katz (2003) showed the development in the USA, Landström, Frank and Veciana (1997) surveyed entrepreneurship research across Europe, and Huse and Landström (1997) compared European and USA entrepreneurship research.

The first entrepreneurship course in the United States was offered in 1947 at Harvard Business School. In 1999 there were 1600 schools offering more than 2,200 courses in entrepreneurship (Katz, 2003). Katz's definition of entrepreneurship, however, is very broad and eclectic and includes small businesses, private enterprises, family businesses, etc.

Nevertheless, it is similar to the way the general public views entrepreneurship. Landström, Frank and Veciana (1997) presented country reports across Europe about entrepreneurship research and education, including the emergence of entrepreneurship chairs. Their reports also showed very high growth among educational programs.

Shane (1997) also explored who is publishing entrepreneurship research in a selection of high quality journals. Huse and Landström (1997) showed that European entrepreneurship research was characterized by methodological openness and contextual differences compared to most entrepreneurship research in the United States. They also described the American entrepreneurship research community as large and homogeneous, with career building as a main driving force for research and publication. There is a focus on parsimony and generalizations. The research community in Europe is small and heterogeneous, but passion seems to be a greater driving force for research. There also seems to be a focus on realism and complexity.

Journals and conferences are the main meeting places and crossroads for entrepreneurship scholars. Katz (2003) reported the existence of 44 English-language refereed academic journals, and the fact that the number of journals has doubled every third year since 1987.

Non-English-language journals also exist, but the number is not growing at a similar rate. Many international and local entrepreneurship conferences and workshops play important roles in developing a research community for entrepreneurship scholars. Some of them have narrowly defined topics, while others use the broad and eclectic "prairie" definition, as indicated by Katz (2003). Some of the conferences and workshops are organized by formal membership organizations, while others rely on informal networks. The main conferences among entrepreneurship researchers in the 1990s were the Entrepreneurship Division at the Academy of Management Meetings and the Babson Conferences. These conferences are American-based, but with large international participation. Their importance is in the contribution to an emerging international convergence of research. Now, however, there is a tendency for the scientific development of the field to be supported through smaller, informal and specialized networks and workshops. These frontier networks may result in a fragmentation of the field with distinct streams of research and researchers.

2.3. Streams in entrepreneurship research – paths or roads leading out

Where are the frontier streams of entrepreneurship research leading to in the future? Studies by the pioneers of entrepreneurship research have showed uncertainty with regards to the domain of entrepreneurship research (e.g. Landström, ibid). Although entrepreneurship research is highly eclectic, it is possible to identify four streams that may receive considerable attention in the future: the synthesis stream, the separation stream, the strategy-integration stream, and the specialized stream.

The *synthesis stream* brings together researchers from several disciplines to explore entrepreneurship. Proponents of this stream include Zoltan Acs and David Audretsch (Acs

and Audretsch, 2003). This stream has evolved from roots in economics and its objectives are public policy oriented. The *separation stream* is spearheaded by scholars such as Scott Shane and S. Venkataraman (Shane, 2002; Shane and Venkataraman, 2000, 2001). Their efforts to develop the field of entrepreneurship and to produce rigorous research involve the development of a framework to separate or distinguish entrepreneurship from other research fields. The *strategy-integration stream* is advocated by strategy scholars such as Jay Barney, Mike Hitt, Duane Ireland and Shaker Zahra (Alvarez and Buzenitz, 2001; Hitt et al., 2001; Zahra and Daft, 2001). Their perspective is that entrepreneurship should be seen as a theme in strategy research, and entrepreneurial and strategic thinking should be integrated.

The fourth group (the *specialized stream*) is not one stream, but various initiatives to develop the field topically. This stream consists of meeting places, including the development of workshops, networks and journals, for scholars with various backgrounds, but with a joint interest in exploring themes related to entrepreneurship, SMEs and family firms. Examples include international entrepreneurship (McDougall and Oviatt, 2000), women in entrepreneurship (Brush, et al., 2002), technological entrepreneurship (Autio, 2000), venture capital and small business finance (Mason and Harrison, 2000), boards and governance in SMEs (Huse, 2000), and family business research (Astrachan, Klein and Smyrnios, 2002).

3. THE STRUCTURE AND CONTENT OF THE BOOK

This book is composed of four sections. Each section gathers contributions that reflect the heterogeneity of the field from different points of view: the discipline's background, the objects of inquiry and methodological approaches, the cultural and institutional context within which entrepreneurship behavior unfolds and is studied, and the relations between theory and practice.

In the first section, outstanding scholars from economics, sociology, management and business history address entrepreneurship from their privileged perspectives. In the first chapter, Hans Landström acknowledges the absence of a dominant paradigm in entrepreneurship research. His insightful review of research conducted in management and in the related fields of economics and psychology reveals how research seems to proceed by successive waves — or "swarms" — of studies that build on seminal work by what the author calls "pioneers" of entrepreneurship research. On the one hand, Landström's paper recognizes the important influence on management research of theories and concepts elaborated within the field of economics — albeit rarely in mainstream economics. On the other hand, his review documents the gradual detachment of management studies, following the growth of empirical work questioning old beliefs about wealth creation, economic growth and innovation in small businesses. Stan Metcalfe's critical essay on the treatment of entrepreneurship and entrepreneurs in economic theory complements Landström's discussion, showing how the plurality of approaches that has characterized entrepreneurship research is justified by the multi-dimensional, complex nature of entrepreneurship. According to Metcalfe, it is exactly for this reason that mainstream economic theory was not able to place entrepreneurship into neat, ordered models postulating market equilibrium, rational choice and minimization of risk. Entrepreneurship, Metcalfe observes, is exactly the opposite: it is about disruption, disorder and risk. This is why only an evolutionary framework, which emphasizes knowledge

flows and recombination of resources can properly account for what entrepreneurs do and how they endogenously affect economic growth. In the third chapter, Alberto Martinelli encourages us to reflect on the social, cultural, political and institutional context of entrepreneurship. His comprehensive review of sociological work in the field provides compelling evidence of how both the structure of market opportunities and entrepreneurial action are embedded in a web of values, beliefs, norms, traditions, and formal and informal relationships. The concept of "double embeddedness" highlights the two major dimensions of entrepreneurship — the politico-institutional environment, and the social and cultural background of the entrepreneur — and sheds light on various patterns of entrepreneurial behavior that will be discussed in the third section. The case of ethnic entrepreneurship discussed at the end of the chapter is a powerful illustration of these arguments. In the last chapter of the section, one of the most respected living historians, David Landes, tells his memories of a life of research spent investigating wealth creation across industries and nations. His vivid narration of how his own work and the field of economic history have evolved in the last few decades are intermingled with reflections emphasizing an aspect — business continuity — which reflects the longitudinal perspective of his discipline.

The second section gathers studies conducted by economists and management scholars. A common feature of these contributions is their exploratory nature. Some of them, such as Andrea Lanza's study of survival in hostile environments or Laura Bottazzi and Marco Da Rin's investigation of how European venture capitalists affect entrepreneurial growth, purposefully question the validity of commonly held beliefs in the field. By focusing their work on non-traditional settings, such as the historically depressed South of Italy, or the rising European market for venture capital, these studies have produced results that only partly conform to past research conducted in the United States. What these studies suggest, beyond their specific results, is the potential benefit to our understanding of entrepreneurship of extending research beyond the boundaries of North American tradition. Chapters by Guido Corbetta, Gaia Marchisio and Carlo Salvato, Morten Huse and Jonas Gabrielsson, and Davide Ravasi, Carlo Turati, Gaia Marchisio and Cataldo Dino Ruta report findings from broad research programs on hitherto under-explored phenomena. Corbetta and colleagues combine quantitative and qualitative research to investigate factors that contribute to preserving or renewing entrepreneurial spirit in family firms. Their findings highlight how entrepreneurial behavior in family firms is affected by the configuration of ownership, and by the traits and experience of family members. In a cross-country, survey-based study on international entrepreneurship, Huse and Gabrielsson explore how governance structures and entrepreneurial posture affect the degree of internationalization of a company in light of emerging globalization. While no significant relationships between governance and internationalization are found, entrepreneurial orientation significantly affects international activities, although its impact seems to be decreasing over time. Finally, Ravasi and colleagues explore learning while innovating in entrepreneurial firms. Building on a longitudinal study of innovation in six firms, the research team identifies conditions that improve the capacity of entrepreneurs to acquire, generate and retain valuable knowledge, embodied in new products or production processes. In the final chapter of the section, Zahra and Hayton's comprehensive review of technological entrepreneurship — i.e. the creation of new firms to exploit technological discoveries — highlights how, despite the number of past studies on the topic, numerous

promising avenues for research still exist in a critical field. Given the exploratory nature of these studies, they rarely offer conclusive results. Taken collectively, however, these studies provide some indications on promising avenues for research, and testify to the vitality and pluralism of the entrepreneurship field.

In section three, management scholar Bengt Johannisson, business historians Franco Amatori and Andrea Colli, and economists Alice Amsden and Takashi Hikino propose alternative interpretations to the prevailing myths of entrepreneurship as an attribute of individual innovators, bold risk-takers and founders of new businesses. Building on research on patterns of entrepreneurship in different geographical settings — Scandinavia, Italy and the Far East — these chapters illustrate how entrepreneurship can actually take different forms and be performed by players other than private individuals. The experience of Scandinavian cooperatives and Italian industrial districts, for instance, indicates how entrepreneurship is often more than mere individual action: it can be a truly collective accomplishment. The case of Italian private groups, Korean *chaebols* and other large Far Eastern concerns shows how entrepreneurship is not always an exclusive privilege of small businesses, but — given certain conditions — can flourish in big business as well. Finally, Amatori and Colli and Amsden and Hikino observe how State ownership or intervention does not necessarily clash with entrepreneurship, but may even play a major role in stimulating Schumpeterian-type innovation in products and processes in late developing countries, as Italy was early in the last century. Taken together, these studies recall Metcalfe's words, when he observes how "the entrepreneur comes in shades of many different kinds." Furthermore, they provide compelling evidence for Martinelli's argument that different social structures, beliefs about entrepreneurs and entrepreneurial action, and regulation systems and ways in which they are enforced profoundly shape where and how entrepreneurship arises in a social and economic system.

Finally, the fourth section synthesizes the final roundtable of the conference that inspired this book. Five panelists, all deeply involved in promoting entrepreneurial action, albeit in different ways, commented on key themes emerging from the academic presentations and shared their own personal experience on the evolution of entrepreneurship in firms and regions. In the first speech, Gianfilippo Cuneo, former partner in Bain and a leading consultant in Italy, points the attention of the audience towards the changing nature of entrepreneurship.

The intensifying international competition — Cuneo argues — is forcing companies to grow and expand their market share at a faster pace than before. Entrepreneurs, therefore, cannot afford to stick to old attitudes and behaviors: surviving, according to Cuneo, means learning to play the game of mergers and acquisitions, outsourcing on a global scale, going public, and raising capital through the market. In this new entrepreneurial game, managers and consultants may take on a leading role in embarking in risky ventures and persuading investors to back them. Federico Minoli is a manager who recently turned Ducati Motor Holding around on behalf of new owner Texas Pacific Group. Building on his experience, Minoli observes how turnarounds require more than good management: they require leadership and entrepreneurship. In his view, being entrepreneurial means having a vision and being able to see things from different angles and unconventional perspectives. Vision, however, is not enough: entrepreneurs, according to Minoli, need a passionate team to realize their ideas; they need the ability "to hoist a flag that people can follow". Passion, emotion —

together with a simple, but precise plan — are crucial components of entrepreneurial success.

Minoli's colorful description of his experience at Ducati provides engaging support to his remarks. The third panelist, Vittorio Giulini, is an entrepreneur and the president of Sistema Moda Italia, an association which gathers small- and medium-sized enterprises in the clothing industry. The Italian fashion apparel industry, according to Giulini, is a good example of how entrepreneurs may draw on the cultural heritage of their country — a concept akin to Pierre Bourdieu's cultural capital — to sustain their entrepreneurial efforts. According to Giulini, the success of Italian companies in the global clothing market can be traced back partly to the Italian cultural environment, with its distinguished taste and artistic traditions, but also to the availability of blueprints for competitive success, based on the integration of design, manufacturing, and retail. In the fourth speech, Gianfelice Rocca, leader of the Techint Group, a diversified international holding with businesses ranging from engineering to public utilities and hospitals, reminds the audience how entrepreneurship can — and indeed should — flourish even in large concerns. The growth of the Techint group has been marked by constant entrepreneurial efforts and by a rare alertness to new ventures and avenues for growth. In this respect, Rocca observes, entrepreneurship is not a privilege of the company's founders and successors, even though the latter may play an important role in preserving the continuity of identity and vision, and in actively developing and promoting managerial and entrepreneurial talent in the company. Raffaele Cattaneo, a civil servant at the Lombardy regional government, concludes by bringing in the perspective of public administrators and policy makers. Lombardy, in the North of Italy, is one of the wealthiest and most dynamic regions in Europe. Entrepreneurship in Lombardy is firmly rooted in industrial districts, diffused technical capabilities, and a distinguished entrepreneurial spirit.

Indeed, Raffaele Cattaneo perceives his job as "not hindering" entrepreneurial efforts. Rather than forcing initiatives or infrastructures, the regional administration has recently turned towards offering a variety of services — including education, financial support, support to internationalization, etc. — to local entrepreneurs.

4. EMERGING THEMES AND ISSUES FOR FUTURE RESEARCH

The conference brought together entrepreneurship scholars from different fields and countries and, through their contributions, we can identify the emerging themes in this field of research.

Various participants (Amatori and Colli; Landes; Corbetta, Marchisio and Salvato) stressed the fact that family businesses are one of the main players in the economy, even in the most developed countries. In North America many entrepreneurs grow their firms quickly and then sell them or hand them over to non-family managers. In other countries, within Europe, Latin America and Asia, firms remain smaller even for long periods of time and there is a culture that looks very positively on involving sons or daughters in managing firms. Therefore, transmitting entrepreneurial skills from parents to children is an extremely important theme in entrepreneurship research on family firms (at least in these parts of the world). The wealth represented by family firms can only be maintained and developed if entrepreneurial talent is nurtured. Therefore it is important to understand what factors affect the willingness of younger generations to get involved in family businesses and learn

entrepreneurial skills from their parents. We should also understand how it is possible to have two types of entrepreneurship in the same firm, from two generations, over long periods.

Often they differ both in their specific characteristics and in their lifecycle stage. Finally, we should also understand how it is possible to develop a collegial entrepreneurship at the top of a firm, seeing that often, from the second generation onwards, it is common for two or more family members to share top responsibilities in family firms.

A second stream of research is concerned with the collective dimension of entrepreneurship (see Johannisson's contribution). Researchers often study entrepreneurship as an individual phenomenon, but in some countries there also exists a collective dimension (for example cooperatives in Northern Europe and industrial districts in Italy). First, we should understand what factors allow for the development of collective entrepreneurship and favor its continuity and replicability. We should ask whether the diffusion of a more individualistic culture (especially following the failure of the Soviet system) can make the cooperative model more difficult to maintain. Second, we should understand the limits of this type of entrepreneurship and whether it is suitable for competitive contexts that are becoming increasingly global and complex in nature. An important theme in Italy is the ability of districts to relocate to lower labor cost areas (per unit produced) without damaging the geographical area in which they are today.

A third stream of research stems from the changes that are taking place today in many parts of the world where the role of the state is being redefined with respect to the economy (Amsden). This research is aimed at understanding how the state and other public institutions (for example local administrations) can favor the development of entrepreneurship. There is still a lot of work to be done on this theme (especially among historians and economists, but also among management scholars) because many public policies in the most developed countries have not obtained the results that were hoped for. What this research area might need is a change of perspective by placing the needs of firms and entrepreneurs at the centre of its studies, rather than placing the role of the state at the centre. A key issue to understand is the impact of interventions that aim to directly reduce factor costs used by firms or to improve the socio-cultural or politico-institutional conditions in which firms operate (Martinelli). Another issue to understand is how different public policies can be successfully applied to cultural and economic contexts that are very different from those of very developed countries. It is worth pointing out that, in this area of research, it is necessary to set aside the ideological dogma that has characterized many past studies.

A fourth stream of research is on the relationship between centers producing scientific knowledge, such as Universities, and entrepreneurs. Empirical evidence suggests the hypothesis that cooperation between Universities and firms is behind many success stories. Especially in Europe, however, Universities are still diffident towards firms because they fear firms may threaten the scientific autonomy of their researchers. Also, the contribution to the development of firms is often not considered in the evaluation of University activities. The question is not easily solved and the problem remains of understanding how the innovation potential of university research can favor economic development. Therefore, entrepreneurship scholars should continue to explore the mechanisms of knowledge diffusion produced by Universities (Zahra and Hayton). They should also focus on understanding how research results can flow to small and medium sized firms and not merely to large ones.

Other research streams seem to be relevant to entrepreneurship studies outside of North America. Two themes have received little attention, particularly in Europe: the contribution of financial intermediaries and ethnic entrepreneurship. Empirical evidence on the first theme suggests that venture capital has not contributed significantly to the development of small and medium sized enterprises in Europe (Bottazzi and Da Rin). The bursting of the internet economy bubble seems to have reinforced the conviction that financial intermediaries are not able, or not willing, to distinguish among different models of entrepreneurship and support the ones that can sustain long term development. Very little has been written on ethnic entrepreneurship even though in Europe migration is changing the social structure of many countries. North American literature can play a useful role in stimulating studies in this area, as long as researchers focus on replicability (Martinelli).

Finally, the theme of entrepreneurial success emerged during the conference and was strongly emphasized by some participants in the final roundtable discussion. The issue is whether entrepreneurs, policy makers and researchers should adopt the same measurements for entrepreneurial success. Various speakers asked questions such as: are economic indicators sufficient? Which economic indicators are appropriate? Should success be measured through the number and type of product or process innovations, even if firms then do not experience economic success? These are very important themes, especially in the context of public policies aimed at developing entrepreneurship.

NOTES

[1]While the ideas presented in the introduction arose from a discussion and reflect an agreement among the authors, Guido Corbetta wrote section 4, Morten Huse wrote section 2, and Davide Ravasi wrote sections 1 and 3.

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PIONEERS IN ENTREPRENEURSHIP RESEARCH

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1. INTRODUCTION

Over the last few decades, entrepreneurship has been a "hot topic" in society as well as in education and academic research. Today, extensive educational activities focusing on entrepreneurship are taking place in universities. Research within this field has grown exponentially, the number of positions and chairs in entrepreneurship has increased dramatically, and Ph.D. programmes specialising in entrepreneurship have been introduced at various universities. On the other hand, entrepreneurship research has been criticized and the progress of the research called into question. For example, concerns have been raised with regards to: uncertainty in the domain of entrepreneurship research (Shane & Venkataraman, 2000), the presence of too many "stakeholders" in the field with diverse interests and expectations in entrepreneurship research (Blackburn, 2001), the transience of the field with a number of researchers only temporarily staying in the field (Landström, 2001) and finally, the highly individualistic nature of the field with a low people-to-problem ratio (Becher, 1989), i.e. the number of questions that can be posed is more or less unlimited, while the number of researchers concerned with each question is rather small.

As a result, entrepreneurship research has become highly eclectic. The level of "convergence" within the field is low — old topics are discarded in favour of new ones — or, as Grégoire, Dery and Béchard (2001) expressed it, "entrepreneurship research appears less characterized by a dominant paradigm as by successive pockets of convergence".

Experience from the history of science shows that, in this emerging phase, individual researchers play an important role in the development of the research field. In 1997, Aldrich and Baker stated that "Those researchers who produce research that creates an interest among others to build on their work shape emerging fields of research." In this paper I will emphasize the importance of pioneer researchers in entrepreneurship research and their role in the development of the research field and in the accumulation of knowledge.

I will argue that the interest in entrepreneurs and entrepreneurship among researchers has a long history, that this interest seems to surface at different times — we can call these periods "swarms" of entrepreneurship research — and that these "swarms" are linked to economic development in society. In addition, during each "swarm" of entrepreneurship research, we can identify individual researchers — pioneers — who have produced path-breaking ideas about entrepreneurship. However, entrepreneurship research today seems

to be highly ahistorical. Theories about entrepreneurship seem to fade out rather quickly (Landström, 2001) and researchers producing interesting and important theories about entrepreneurship do not seem to be as influential as could be expected from the statement by Aldrich and Baker. In order to develop entrepreneurship research we need to focus more on the important and interesting questions — the questions that make a difference for wealth creation — and prompt a certain movement of the mind of the audience. However, entrepreneurship research should not only try to develop new theories. What is needed is a balance between the creation of new knowledge and the development of "robust" research refining and extending this knowledge.

This paper consists of eight sections. In the next section I will describe and explain "swarms" of entrepreneurship research, i.e. periods in history during which entrepreneurship research has been prominent. Thereafter, the pioneer researchers contributing to each swarm of entrepreneurship research will be discussed (Section 3 to 7). Finally, the contributions of these pioneers will be discussed in terms of their role in knowledge accumulation within the field.

2. "SWARMS" OF ENTREPRENEURSHIP RESEARCH

Looking back at the history of entrepreneurship research, it is interesting to observe that our knowledge about entrepreneurship seems to have been developed with a certain chronological regularity — "swarms" of entrepreneurship research seem to have appeared at different times in history. For example, we can identify such "swarms" at the following points in time:

1860-1880	Austrian and German economists Johann von Thünen, Hans Emil von Mangolt, Carl Menger, Friedrich von Wieser, and Eugen von Böhm-Bawerk based their research on a tradition rooted in political science and administration.
1890-1920	Many of Joseph Schumpeter's thoughts on entrepreneurship were developed during this period. US economists such as Fredrick Hawley, John Bates Clark and, at a slightly later stage, Frank Knight had a major influence.
1950-1970	Based on a strong behavioural science tradition, this period includes pioneers such as David McClelland, Everett Hagen, Seymour Martin Lipset, and Fredrik Barth.
1985-	There is an increased interest from researchers within small business economics and management studies, for example David Birch (the role of small firms in employment), Zoltan Acs and David Audretsch (small firms in innovation), Giacomo Becattini and Sebastiano Brusco (small firms and regional development), Arnold Cooper (technology-based firms), Howard Aldrich (ethnicity and networks), Jeffrey Timmons and William Wetzel (the role of venture capital), and Ian MacMillan, Peter Drucker, and Rosabeth Moss Kanter (entrepreneurship as a strategy). Why, then, do these "swarms" of entrepreneurship researchers appear at certain periods in time? A likely explanation is that there is a strong

link between societal development and interest in entrepreneurship research — periods of economic difficulties and crises give rise to demands for change and the creation of new ways of thinking. Entrepreneurship research thrives and peaks during periods that are characterized by powerful dynamics and development.

The Swedish economic historian Lennart Schön (2001) argues that the development of western economies follows long-term structural cycles of about 40 to 50 years, and each structural cycle is initiated and shaped by some form of international economic crisis. Each cycle can be divided into two periods, characterized by different behaviours:

a) A *transformation* period — i.e. a period dominated by the transformation of industrial structures, in which resources are reallocated between industries, and by the diffusion of basic innovations within industry, thus providing new bases for such reallocation. During these periods, investment is generally long term and directed towards increasing capacity in new areas of production.

b) A *rationalization* period — i.e. a period dominated by the concentration of resources in the most productive units within the industry and by measures to increase efficiency in different lines of production, i.e. aimed at increasing efficiency of existing structures and operations and decreasing resource utilisation. Investments, which are short-term in character, are directed towards reducing costs in existing structures and operations.

Although transformation and rationalization are processes that to a large extent take place simultaneously in an economy, historically there have been shifts in emphasis between periods of transformation and rationalization. These shifts occur with considerable regularity within a long structural cycle, for example 25 years of emphasis on transformation, followed by some 15 years of emphasis on rationalization. Thus, we can find a pattern of long cycles characterized by crisis-transformation-rationalization. Starting from the mid 19th century, the following long cycles can be identified in the world economy (see Table 1):

Table 1. Long-term structural cycles

CRISES →	TRANSFORMATION →	RATIONALIZATION	BASIS FOR THE STRUCTURAL CYCLE
1845/50		1875	Breakthrough of mechanized factories and development of railways.
1890/95		1920	Breakthrough of the modern industrial society.
1930/35		1960	Breakthrough of electrification and the spread of automobiles.
1975/80		2000/05	Breakthrough of electronics, especially the microprocessor and information technology.

It appears obvious that the "swarms" of entrepreneurship research are related to periods of transformation characterized by far-reaching societal renewal, the emergence of new structures giving rise to a new direction for economic growth, and the rapid spread of new technical solutions. On the other hand, interest in entrepreneurship appears to be less marked during periods of rationalization and more associated with stable societal relationships, increased production efficiency and short-term perspectives. Thus, one conclusion is that, throughout history, there has been a link between societal development and entrepreneurship research (see Table 2).

Table 2. Linkage between societal development and entrepreneurship research

	TRANSFORMATION	RESEARCH	FOCUS
1850-1870	Mechanized factories and railways	Economists Austrian/German researchers	Entrepreneurship as a function of the market – the ability of the entrepreneur to perceive opportunities for profit
1890-1920	Modern industrial society	Economists USA/Austrian researchers	Entrepreneurship as a function of the market – the entrepreneur a creator of instability and creative destruction
1950-1970	Electrification and automobiles	Behavioural scientists US researchers	The entrepreneur as an individual (traits)
1985-	Electronics	Management studies mainly US researchers	Entrepreneurship as a process

During each "swarm" of entrepreneurship research, there seems to have been some pioneer researchers who have produced path-breaking research that has opened up new questions. Who were these pioneers? And what are their contributions?

3. PIONEERS IN ENTREPRENEURSHIP RESEARCH

In entrepreneurship research, Richard Cantillon and Jean Baptiste Say are often given credit for introducing the concept of entrepreneurship into the literature of economic science. Richard Cantillon (circa 1680-1734) was an Irish-born banker who lived in Paris. His work *Essai sur la Nature du Commerce en Général,* published posthumously in 1755, not only gave meaning to the concept of entrepreneurship but also defined the role of the entrepreneur in economic development. Cantillon recognized that discrepancies between demand and supply in a market create opportunities for buying cheaply and selling at a higher price, and that this sort of arbitrage would bring the competitive market into equilibrium. The presumption was that the entrepreneur would buy products at a fixed price, have them packaged and transported to market, and sell them at an unpredictable, uncertain price. A basic characteristic of Cantillon's analysis was the emphasis on risk and the fact that entrepreneurship demands foresight and willingness to assume risk.

By the mid-18th century, changes in production conditions, social relations and ways of thinking began to emerge. These changes also had a bearing on the intellectual and academic environment. In the realm of economic science, "classical" economic theory was developed. It is generally regarded as having its origins in Adam Smith's (1723-1790) *Inquiry into the Nature and Causes of the Wealth of Nations* (1776). In many ways this work set the trend for economic theory and in it Smith laid the foundation for the analysis of the way in which the market economy functions. Smith's work influenced the view of the entrepreneur held by economic science: he did not distinguish between the capitalist as the provider of the "stock" for the enterprise and the entrepreneur as the ultimate decision-maker, neither did he deal with the entrepreneurial function in the economy. Instead, it was the capitalist who became the central actor in Smith's analysis. This failure to differentiate between entrepreneurship function and pure ownership of capital became standard practice among classical economists.

There were, however, a small number of economists, who maintained a certain amount of interest in entrepreneurship, such as Jeremy Bentham (1748-1832), John Stuart Mill (1806-1873), and Alfred Marshall (1842-1924). But it was the French economist Jean Baptiste Say (1767-1832) who broke the trend. In his works, *Traité d'économie politique* (1803) and *Cours complet d'économie politique practique* (1828), Say defined entrepreneurship as the combining of the means of production into an organism. He gave an empirical description of the role of the entrepreneur as well as an analysis of the entrepreneurial function in the economy. He saw the entrepreneur as a "broker", who organizes and combines means of production with the aim of producing goods. The efforts of these entrepreneurs are not random — they are directed at the creation of goods or services that have a value or utility.

In addition, Say did not take the view that the entrepreneur was merely a coordinator of the means of production — on the contrary, he was the one who carried out these activities on his own behalf (i.e. assumed the risk).

4. THE FIRST "SWARM" OF ENTREPRENEURSHIP RESEARCH

The first "swarm" of entrepreneurship research in the mid 19th century was based on the thoughts of Austrian and German economists, such as von Thünen (1783-1850), von Mangoldt (1824-1868), Menger (1840-1921), Böhm-Bawerk (1852-1914), and Weiser (1851-1926).

This "swarm" had its roots in administration and political science, but several of the authors also made major contributions to our understanding of the entrepreneur.

In particular, Carl Menger is often regarded as the ideological founder of the so-called Austrian tradition of economic thought. His contribution to classical economics is mainly found at the methodological level. In his seminal work *Grundsätze der Volkswirtschaftlehre,* (1871), he introduced a subjectivistic view of the economy. He was the proponent of methodological *subjectivism,* in which economic phenomena are not perceived as relations among objects but among people. In order to understand such relations, economic theory must proceed from the social, cultural and economic conceptions that govern human actions. Unlike the natural sciences, economics cannot disregard the perceptions, wishes and views of the people that are being studied. This view is also reflected in Menger's methodological *individualism.* Within society and economics, actors are individuals — not a group or social

class. This means that explanations of economic phenomena have to proceed from individual actions or at least it should be possible to refer back to them (Pålsson-Syll, 1998). Thus, economic changes do not take place in a vacuum but are created by individuals' awareness and understanding of a given situation. This means that the entrepreneur can be considered as an "agent of change", who transforms resources into useful products and services.

These ideas were later developed further by followers such as Ludwig von Mises (1881-1973) and Frederick von Hayek (1899-1992). According to Mises (1951), entrepreneurship is about correctly anticipating the market. If the entrepreneur is successful in anticipating the market, he or she will be able to produce more cheaply than competitors and earn profit by being useful to the customer — the more useful, the more profit will be made — and therefore it would be destructive to tax or confiscate the entrepreneur's profit in any way.

Furthermore, Mises (1963) observed that people are not only calculating creatures but also try to make the most of opportunities. He introduced the concept of "human action" to describe this behaviour. Hayek (1945) pointed out that, in a market economy, knowledge is often divided among different individuals, so that no one individual possesses the same knowledge or information as another. This means that there are only a few people who know about certain shortages or resources that are not used to maximum effect. This knowledge is unique since it is obtained through every individual's particular situation, occupation, social network, etc.

During the last decades, one of Mises' students at New York University, Israel Kirzner, has stood out as the leading exponent of the Austrian tradition. In his book *Competition and Entrepreneurship* (1973), Kirzner develops arguments raised by Mises and Hayek. According to Kirzner, it is fundamental for an entrepreneur to be alert in order to identify and deal with profit-making opportunities ("entrepreneurial alertness"), i.e. the entrepreneur tries to discover profit opportunities and helps to restore equilibrium in the market by acting on these opportunities. The entrepreneurial function, in this respect, involves coordinating information by identifying the gap between supply and demand, as well as acting as a broker between supply and demand, making it possible to earn money from the difference. Thus, the entrepreneur looks for imbalances in the system. In such situations, there is an asymmetry of information in the market, which means that resources are not coordinated in an effective way. By seeking out these imbalances and by constantly trying to coordinate resources in a more effective way, the entrepreneur steers the process towards equilibrium. Thus, Kirzner regards the entrepreneur as a person who is alert in identifying imperfections in the market through information about the needs and resources of different actors. With the help of this information, the entrepreneur coordinates resources in a more effective way, thereby creating equilibrium. Figure 1 shows the first "swarm" of entrepreneurship research, based on the contributions of Austrian and German economists and later developed by followers such as von Mises, Hayek, and Kirzner.

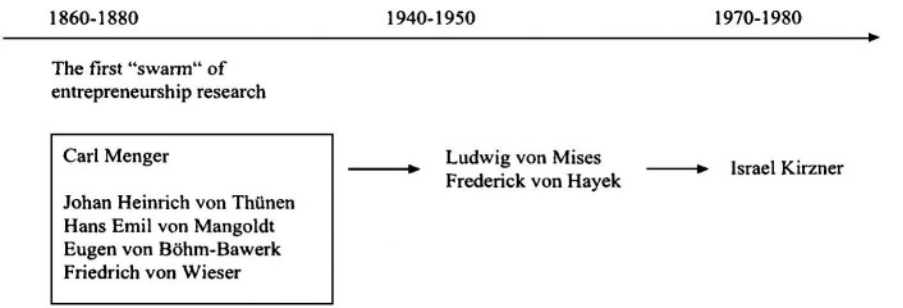

Figure 1. The first "swarm " of entrepreneurship research

5. THE SECOND "SWARM" OF ENTREPRENEURSHIP RESEARCH

In the late 19th century, the European discussion on entrepreneurship found an audience in the United States, which at that time was well on the way to becoming a major industrial power. American economists who continued to develop the discussion on entrepreneurship included for example Francis Walker, Fredrick Hawley, and John Bates Clark. Perhaps the best known economist in this context was Frank Knight (1885-1972). In his thesis *Risk, Uncertainty and Profit* (1916, revised 1921), Knight makes a distinction between risk and uncertainty. Knight argues that entrepreneurship is mainly characterized by uncertainty, i.e. a situation that is uncontrollable and that cannot be appraised in terms of probability. The profit that accrues to the entrepreneur is the reward for his/her risk-taking under conditions of uncertainty.

However, it was Joseph A. Schumpeter (1883-1950) who tried to make the entrepreneur a central figure in economic theory. Schumpeter is regarded as a social scientist, and his extensive scientific production encompasses a wide field within economic theory. In his scientific works, he attempts to construct a new economic theory in response to the ideals of equilibrium developed and advocated by, among others, Leon Walras (1834-1910). Schumpeter himself was a great admirer of Walras, although he considered that the prevailing equilibrium theory was incomplete — there was an "energy" within the economic system that gave rise to imbalances in the market. His work *Theorie der Wirtschaftlichen Entwicklung* (1912, second edition 1926) or *Theory of Economic Development* (1934), which is the English translation of the second edition, was Schumpeter's first attempt to communicate these lines of thought. However, the first and second editions are rather different. Of the two, the first edition is more original and bears all the hallmarks of youthful enthusiasm.

Nevertheless, the second edition, especially the English version, is most often referred to.

This edition is more streamlined and in it Schumpeter tries to relate his work to the mainstream economic thinking of the period.

In his book *The Theory of Economic Development* (1934), Schumpeter attempts to construct a new economic theory. Therefore it comprises a discussion about the significance of capital, the origin of profit, and economic cycles. The entrepreneur is only treated in one chapter (Chapter 2) of the book. This chapter has had a great impact, while his other lines of reasoning have failed to gain a foothold within economic theory.

Schumpeter's basic view is that economic growth results not from capital accumulation but from innovations or "new combinations". His point of departure is that equilibrium is predominant in the economic system. He regards the economic system as a closed circular flow *(der Kreislauf)* due to the fact that a seller of a certain commodity will subsequently be the buyer of other commodities. The system is in a state of equilibrium, resulting in a continuous reiteration of the flows. However, this does not mean that changes do not occur but rather that all actors involved adapt to the new situation as soon as the changes are detected. Sometimes, however, radical changes occur in the system, due to a tendency of the entrepreneur to break the equilibrium by introducing innovations in the form of new products, methods of production, markets, investment goods, or organization of industrial units and branches. Once Schumpeter recognized the crucial role of innovation for economic growth, he understood that innovation had to be implemented by someone. This ability to break with established practice was primarily related to individual entrepreneurs – entrepreneurs characterized by their desire to found private kingdoms, the will to conquer, and the joy of creating. Using a more modern language (Swedberg, 2000, p 16), this can be expressed as: (i) the desire for power and independence, (ii) the will to succeed, and (iii) the satisfaction of getting things done. According to Schumpeter, money *per se* is not a driving force for the entrepreneur. However, these innovations, which change the established pattern, do not tend to occur evenly in the course of time but in "swarms". The fact that entrepreneurs break down barriers stimulates other individuals to follow in their footsteps. The upturn in the economy brought about by these innovations has qualitative effects on the economic system in the form of what Schumpeter calls "creative destruction", implying that positive economic development leads to its own crisis.

However, it should be noted that Schumpeter's work and view on entrepreneurship underwent a change over time. Up to 1940 he was mainly interested in developing his mode of reasoning about entrepreneurship and integrating these lines of thought into his new economic theory. During this period, he took the stance that entrepreneurship was the work of the individual. However, during the interwar period in the USA, he encountered a different corporate world to that found in the Austria of his youth. In the USA the corporate scene was dominated not by small firms with distinguishable entrepreneurs but by large companies with advanced research departments engaged in planned research. This spurred Schumpeter's interest in innovative activities in already existing organizations. At the same time he developed a growing interest in economic history. This change in focus finds expression in, among other things, his book *Capitalism, Socialism and Democracy* (1942), in which he focuses on the institutional structure of society. In his book, he raised the question of whether capitalism as an economic system would be able to survive. He predicted that socialism would eventually displace capitalism in Western democracies. Schumpeter predicted a decline in the economic importance of the entrepreneur, which he considered would be one of the major forces in the transformation from capitalism to socialism In his book he argued

that increased rationality and routine in society weakens entrepreneurship, thus leading to the stagnation of capitalism. Innovations would no longer be related to the expertise of a single person, but become the fruits of organized efforts of large teams, most efficiently performed within the framework of large corporations — making large corporations increasingly predominant in the economy.

Schumpeter's reasoning has remained a basic point of reference for many researchers.

I will mention some economists who have been instrumental in further developing Schumpeter's lines of thought:

Erik Dahmén (1950; 1970) formulated the concept of "development blocks" to describe an integrated industrial system within a nation. In a development block, different kinds of complementarities are developed, i.e. different institutions and companies support each other because they work with the same basic material or have other production-related points of contact. New innovations such as railways, electrification and motorization give rise to new complementarities in society. These development blocks have had a fundamental impact on society, contributing to the establishment of old companies in new locations as well as allowing radically new companies to utilize these changes. Thus, these development blocks lead to the creation of swarms of innovations as described by Schumpeter.

William Baumol's (1968; 1990; 1993) basic thesis is that the supply of entrepreneurs in a society is constant but that the societal value of their self-interested ingenuity vanes according to the rewards they can receive. This indicates that, in order to encourage entrepreneurship, it is necessary to create conditions that allow the entrepreneurial pursuit of self-interest to go along with social wealth creation. In this respect, Baumol argues that entrepreneurship can be found in many societies throughout history but, while it is productive in some, it is unproductive and even destructive in others. In other words, entrepreneurial activities may have negative consequences in terms of decreased social income and welfare — the entrepreneur earns money at the expense of other citizens in society. For example, different types of company acquisitions can sometimes turn into unproductive entrepreneurship and, quite often, legislation and the legal system prevent or delay the exploitation of new ideas. Figure 2 shows the second "swarm" of entrepreneurship research, mainly focusing on the contributions of Schumpeter and some followers such as Dahmén and Baumol.

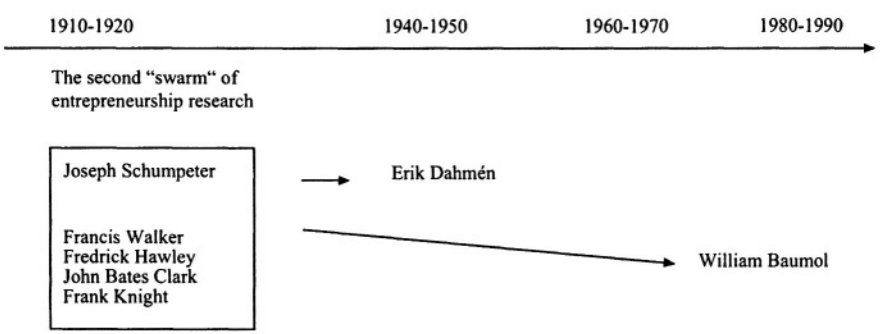

Figure 2. The second "swarm" of entrepreneurship research

6. THE THIRD "SWARM" OF ENTREPRENEURSHIP RESEARCH

In the course of the last half century, it seems that entrepreneurship has been more or less overlooked in economic models, with a few exceptions (e g. Dahmén and Baumol).

An intra-scientific explanation is that economic science has focused more and more strongly on equilibrium models — which constitute the dominant paradigm in the field and which do not seem to have any room for the entrepreneur (Barreto, 1989; Kirchhoff, 1994). Another, more extra-scientific, explanation may be that after Schumpeter the attention of society moved from trying to explain entrepreneurship towards developing entrepreneurship. However, economists were unable to play a useful role in identifying and developing this ability. Instead, behavioural science researchers, and especially psychologists, saw an open field and increasingly took over the responsibility for continuing the theoretical development.

When it comes to what motivates entrepreneurs to strive for success in the economic sphere, behaviourists tend to emphasize the psychological factors involved. One of the pioneers that should be mentioned in this respect is Everett Hagen who, in his substantial work *On the Theory of Social Change: How Economic Growth Begins* (1962), studied how a more traditional society is transformed into an economic growth society. Hagen explores how social exclusion and degradation produce individuals determined to accumulate wealth. He argues that people who have grown up in certain minorities develop a much stronger psychological propensity for entrepreneurship than those who have not.

The most well-known pioneer among behavioural scientists with an interest in entrepreneurship is David McClelland (1917-1998). He was one of the first to present empirical studies in the field of entrepreneurship that were based on behavioural science theory. In his pioneering work *The Achieving Society* (1961), McClelland discussed the following question: Why do certain societies develop more dynamically than others? For example, why did mediaeval Florence become the hub of the Renaissance? And why did the same development not appear in other places with seemingly similar preconditions? Here McClelland built further on Max Weber's reasoning in *The Protestant Ethic and the Spirit of Capitalism* (1904/1978), in which Weber made an analysis covering the interplay between culture and the economic development of a society. Weber's argument was that certain puritanical traits in the Protestant moral code resulted in a combination of thrift, a sense of duty, industriousness and self-denial, and that these characteristic traits made the development of capitalism possible. For McClelland, the premise was that the norms and values that prevail in a given society, particularly with regard to the need for achievement (nACH), are of vital importance for the development of that society.

By means of a large number of experimentally constructed studies, McClelland demonstrated the link between a nation's need for achievement and its economic development. For example, as an indicator of the degree of need for achievement in a society, he studied popular legends and fairy tales, both modern and historical, from different parts of the world in order to relate them to a nation's economic development. The results show that there appears to be a relation between a nation's degree of need for achievement and its economic development. He points out, however, that economic development is a complex phenomenon, which cannot be explained merely in terms of need for achievement. Consequently, other variables need to be considered, such as the individual's relationship motive and need for control.

He concludes that economically better developed nations are characterized by lower focus on institutional norms and greater focus on openness towards other people and their values, as well as communication among people. It is in this context that entrepreneurs become the major driving force in the development of a nation. In other words, a country's level of achievement is transformed into economic growth through the medium of the entrepreneur. If the need for achievement in a country is high, there will probably be individuals who will act as entrepreneurs. Entrepreneurs are, in this regard, individuals who have a high need for achievement, strong self-confidence, and independent problem-solving skills, and who prefer situations that are characterized by moderate risk, follow-ups of results and feedback, and the acceptance of individual responsibility.

McClelland's contribution meant that personal qualities of the entrepreneur occupied a prominent position in entrepreneurship research within the field of behavioural science during the 1960s and 1970s. There are a large number of studies that attempt to identify the particular qualities of the entrepreneur, some of which are (Delmar, 2000):

a) Need for achievement: one of the most common characteristics associated with entrepreneurs and based on McClelland's study.

b) A propensity for risk-taking: the role of the entrepreneur as the risk-taker or risk-bearer in the economic system can be traced back to early economic science writers, especially Knight (1921).

c) Locus of control: this concept, developed by Rotter (1966), is about whether a potential goal can be attained through one's own action or if it is merely the result of uncontrollable external factors.

d) Over-optimism: entrepreneurs often display a high degree of over-optimism, which was reported by Cooper, Woo and Dunkelberg (1988).

e) Desire for autonomy: entrepreneurs seem to have a great need for autonomy (Sexton and Bowman, 1985) and a fear of external control (Smith, 1967).

A review of psychological approaches to entrepreneurs would be incomplete without mentioning the contributions within the psychoanalytical-oriented tradition, which assume that the behaviour of the individual is best understood in terms of a number of intrinsic qualities. The basis for these qualities is formed early in life. The main exponent of this research tradition is perhaps Ketz de Vries. In his work *The Entrepreneurial Personality* (1977), he takes the view that entrepreneurial behaviour is the result of experiences in early youth, when this is characterized by an unhappy family background with various kinds of psycho-social problems. Because of this, the individual acquires a deviant personality, is unable to function in a structured social environment, and has difficulty accepting authority and working together with others.

Behavioural science researchers were not only interested in defining who the entrepreneur was but also in showing how the entrepreneurs differed from other groups of leaders.

Entrepreneurs constituted a fairly heterogeneous group of people, which meant that it was essential to classify them in relation to other groups of leaders as well as within their own group. Several researchers have discussed these differences. Among the pioneers in this field are Orvis Collins, David Moore and Darab Unwalla, who examined the differences between managers in large businesses and entrepreneurs, and Norman Smith, who identified different types of entrepreneurs.

Collins, Moore and Unwalla (1964) built on an earlier study by Warner and Martin *The Industrial Man* (1959), in which the authors attempted to characterize the successful business leader. Collins et al. found differences between managers and entrepreneurs in terms of their views on authority and their insight into the need for social skills. The manager fits into the system and considers it natural to make a career in the hierarchy, whereas the entrepreneur feels that he or she is a prisoner of the system and wants to break free. They also found that entrepreneurs constitute a heterogeneous group of individuals and that there is a need to classify different types of entrepreneurs. The best know classification is perhaps that of Smith who, in his work *The Entrepreneur and his Firm* (1967), distinguished between the "craftsman entrepreneur" and the "opportunistic entrepreneur". Each of these types is a reflection of the other. The craftsman is described as a person who is qualified in a limited field, not very flexible, and who focuses on the past and present. Smith was also interested in the connection between the type of entrepreneur and the type of company he created. He found that the company run by a craftsman is rigid in that the changes in customer groups and products are small, the production equipment is located in the same place and the market is local or regional. In contrast, opportunistic entrepreneurs often tend to start more 'adaptive' companies. The heterogeneity of entrepreneurs and the need to focus on the differences between the two types of entrepreneurs have resulted in Smith's typology being used and developed in a large number of studies over the years.

The number of traits identified in research has gradually increased and, with a few exceptions (e.g. "need for achievement"), it has been difficult to link any specific traits to entrepreneurial behaviour (Delmar, 2000). For this reason, research into individual traits has been extensively criticized, both on conceptual and on methodological grounds, but also due to the fact that an increasing number of companies are founded by teams and not by single individuals Despite this, the attempt to identify entrepreneurial traits in various individuals still persists, but current research is more rigorous in terms of concept development as well as more sophisticated in the use of methods. The models have also become more complex, taking into account the situation and the individual's perception of the situation.

The third "swarm" of entrepreneurship research, based on a strong behavioural science tradition, is summarized in Figure 3.

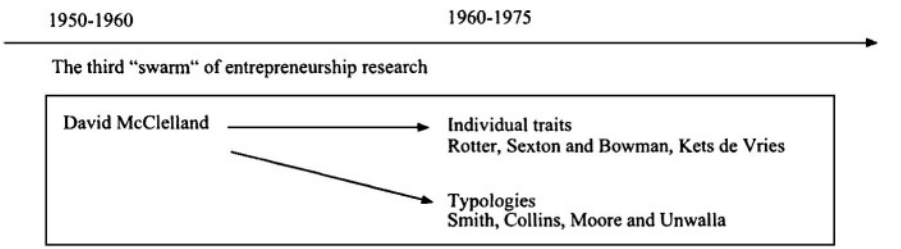

Figure 3. The third "swarm" of entrepreneurship research

7. THE FOURTH "SWARM" OF ENTREPRENEURSHIP RESEARCH

For many years industrialization and economic development were assumed to be based on mass production. Large companies were seen as having superior efficiency as well as being the most important driving force behind technological development. The notion that large-scale production and a social order with strong collectivistic elements were conducive to economic development was firmly established among social scientists at the time. One of the most influential thinkers was John Kenneth Galbraith who, in his books *American Capitalism* (1956) and especially in *The New Industrial State* (1967), provided an important rationale for an economic policy oriented towards the large corporations. Galbraith argued that innovative activities as well as improvements in products and processes were most efficiently carried out in the context of large corporations. Similarly, in *The Rise of the Western World* (1973), Nobel Laureate Douglass North gave the entrepreneur a very minor role in economic development — and hardly mentioned the topic at all.

As a result of turbulence in the world economy during the 1970s, the first signs began to emerge that large systems are not always preferable. Many large companies were hit by severe economic problems. Increasingly, large companies were seen as being inflexible and slow to adjust to new market conditions. As a consequence, economic activity moved away from large companies to smaller firms. Carlsson (1992) found two explanations for this shift: (i) a fundamental change in the world economy, related to the intensification of global competition, the increase in the degree of uncertainty, and the growth of market fragmentation; and (ii) changes in the characteristics of technological progress. The depression of the 1970s and 1980s initiated a series of technological waves — first the development of information technology and later the biotechnological wave. As a consequence, new areas of interest emerged, and topics such as entrepreneurship, innovation, industrial dynamics, and job creation (Acs, 1992) increasingly came to dominate the political debate. This development received additional support from politicians such as Ronald Reagan in the US and Margaret Thatcher in the UK, who pursued a policy strongly in favour of promoting small business and entrepreneurship. For example, President Reagan referred to the decade as the "Age of the Entrepreneur" in his 1985 address to the nation.

It was in this context that David Birch presented his seminal work *The Job Generation Process* (1979). Birch was interested in understanding how jobs were created. The main problem was to obtain adequate data — existing databases were not capable of coping with large longitudinal data. Birch used Dun & Bradstreet data, originally developed for credit ratings. The research group acquired the complete files for the US as of 31 December 1969, 1972, 1974 and 1976 —containing about 12 million records and over 100 reels of magnetic tape. Considerable efforts were made to reduce the files into a compact set, with all four years merged together, thus making it possible to analyze changes in each firm between the different years. Each establishment was assigned a unique identification number, and the files for the four years were matched on a case-by-case basis.

What did Birch and his research colleagues find? As mentioned, the study was focused on job creation and some interesting findings emerged. First migration of establishments from one state to another in the US played a virtually negligible role. Often much media attention was given to the migrations of firms from one region to another, but the symbolic effect seemed to be more important than the actual effect on the job base. Second, job losses seemed to be about the same everywhere — death and contraction rates varied little from one region to another, despite the rather large range of net change rates involved. The variation in net change was mainly due to variations in the rate of replacement, not the rate of loss. Thus, different rates of job replacement are the crucial determinant of the growth or decline of a region. But who are the major generators of these jobs? What kinds of firms play a critical role in job creation?

The results showed that independent firms had the highest rate of growth and played an important role in industries such as farming, but also in trade and service sectors, which were the growing sectors in the economy during the 1970s. On average, about 60 percent of all jobs in the US were created by firms with 20 or fewer employees, about 50 percent of all jobs were created by independent small entrepreneurs, whereas large firms (with over 500 employees) generated less than 15 percent of all net new jobs. But not all small firms are job providers. The smaller, younger firms generated jobs — once the firms had been in operation for over four years, their job generation powers declined substantially.

Only twelve copies of the report were sold, but its influence was enormous, not least on policy-makers. The report also had an enormous impact on the research community — although it has been a source of considerable controversy and criticism (see e.g. Storey and Johnson, 1987; Storey, 1994, Kirchhoff, 1994). It provided the intellectual foundation for researchers throughout the world to incorporate smaller firms into their analyses of economic development. Many of the findings have proved to be very robust and have been verified in many later studies (see for example studies by Storey, Kirchhoff, and Reynolds).

At the same time two Italian economists, Giacomo Becattini and Sebastiano Brusco, resurrected the concept of industrial district, originally formulated by Alfred Marshall. They developed the concept by moving the focus away from clusters of small firms towards a broader perspective of mergers between community and inter-related firms — strengthening the non-economic, socio-territorial dimension of the concept. The empirical work of Becattini was mainly based on the development of the Tuscan economy, whereas Brusco studied the industrial district of Emilia Romagna. They observed the importance of small firms for

regional development. In this respect, research on industrial districts has had an enormous impact on policies for regional development. It has also contributed to our understanding of innovations as a social process, learning regions and the importance of networks in the development of small firms. This research has influenced further research in a narrow as well as broad sense (see e.g. research by Michael Porter, AnnaLee Saxenian, etc.).

Following Birch's line of thought that small firms are important for the development of the economy, Zoltan Acs, in his work *The Changing Structure of the US Economy: Lessons from the US Steel Industry* (1984), argued that small firms should not be viewed as less efficient copies of larger enterprises. Small firms have an innovative role in the economy — as agents of change. Acs' empirical data were collected from the US steel industry, where he found that mini-mills seemed to produce different products, using different inputs and different production processes. Small firms seemed to have large innovative advantages — at least in the US steel industry. To elaborate on the findings from the US steel industry, Zoltan Acs, together with David Audretsch, began to investigate the determinants of innovative activity in different industries, focusing on the question: what role do small firms play in innovative and technological changes in the economy? By investigating this question in a very systematic way, they made a number of methodological contributions and increased our understanding of the role of small firms in innovative and technological changes in different industries.

In recent years, Roy Thurik has focused on the relation between entrepreneurship/small businesses and economic growth (see e.g. Wennekers and Thurik, 1999; 2001). Based on a historical analysis and extensive statistical data at national level, the results support the view that differences in the business ownership rate across countries have an effect on economic growth and that countries lagging behind in the restructuring process will pay the penalty in terms of lost macro-economic growth.

Figure 4 shows the fourth "swarm" of entrepreneurship research, based on researchers mainly from the field of management studies.

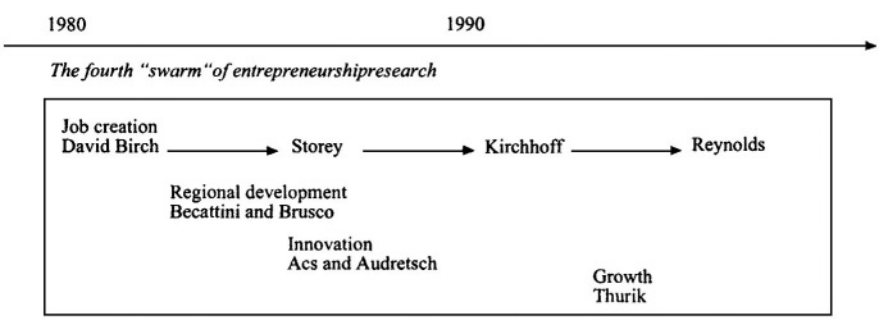

Figure 4. The fourth "swarm" of entrepreneurship research

8. THE CONTRIBUTION OF THE PIONEERS IN ENTREPRENEURSHIP RESEARCH

What are the contributions of these pioneers? Most entrepreneurship research today could be regarded as rather mediocre and dull — it tells us nothing interesting (we hear expressions such as "of course", "that's obvious", or "everybody knows that") or nobody thinks it is important (we can hear statements such as "so what", "who cares", or "why bother"). What the pioneers have done sets them apart from this relatively mediocre research — they have produced path-breaking knowledge, which has opened up new research questions.

Against this background, we need to reflect upon the following question: "What distinguishes a mediocre researcher from an ingenious one?" We tend to think of researchers as being great because their theories are true. But this is open to question: a researcher is considered great, not because his/her theories are true, but because his/her theories are interesting (Davis, 1971). What makes a theory interesting? In my opinion, interesting theories are those that contradict certain taken-for-granted assumptions and beliefs. For example: what seems to be a disorganized phenomenon is in reality an organized phenomenon; what seems to a single phenomenon is, in reality, composed of heterogeneous elements; what seems to be a phenomenon that functions ineffectively is, in reality, a phenomenon that functions effectively. Pioneers in entrepreneurship research have proposed interesting theories about the phenomenon that we call entrepreneurship.

Pioneers have not only proposed interesting theories about entrepreneurship. Their theories have also been important — their contributions have in many cases been highly relevant for the development of the society — for example, by showing the importance of young and small firms for job creation, enlarging our understanding of innovations and of the interlinks between large corporations and entrepreneurship for economic development, etc. In entrepreneurship research we need to ask the important questions, the questions that have an impact on wealth creation in society.

Thus, what the pioneers of entrepreneurship research have done is to focus their efforts on important questions — making a difference for wealth creation in society — but also to develop interesting theories about the phenomenon — theories that involve a certain movement of the mind of the audience.

However, I will not argue that entrepreneurship research should continually try to develop new — important and interesting — theories. What we need is a balance between the creation of new knowledge and the development of old certainties ("robust" research refining and extending these theories). To elaborate on this statement, March (1991) makes a distinction between "exploration" and "exploitation". The essence of exploration is experimentation with new alternatives and its outcomes are often less certain, more remote in time and more distant from the locus of the field. On the other hand, the essence of exploitation is the refinement and extension of existing competencies and paradigms and its outcomes are proximate, predictable and often more positive in the short term. Based on March's reasoning, we could say that entrepreneurship research needs to create a balance between exploration and exploitation. The path-breaking theories developed by the pioneers of the field could be a good starting point for refinement and extension.

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THE ENTREPRENEUR AND THE STYLE OF MODERN ECONOMICS

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1. INTRODUCTION

Economic heory and the entrepreneur have never made easy travelling companions and I want in this brief essay to enquire why this is so. This is an important problem for it raises the question of the extent that economic theory has really come to terms with the nature of capitalism as an engine of growth and development. At the same time, it is a difficult problem to solve satisfactorily, and any resolution requires that what managers do be distinguished from what entrepreneurs do. In itself, this would be the basis for a very long essay. Yet, the justification of even a brief treatment is that these are questions that can, and should, bind economists and management scholars in a common endeavour. At the outset, we must recognize that acceptable definitions of entrepreneurial activity and its image, the entrepreneur, the agent of entrepreneurial behaviour, are not readily achieved. Entrepreneurship is not one-dimensional and the entrepreneur comes in shades of many different kinds, such that it is presumptuous to conceive of a simple, unifying approach. Baumol (1993) in his extended discussion of the topic includes, 'the use of imagination, boldness, ingenuity, leadership, persistence and determination' as relevant characteristics of those who engage in novel activities: a list that adequately warns us of difficulties that lie ahead in finding an adequate frame of analysis for these troublesome individuals. None is offered here, although we will see how the ability of a theoretical frame to incorporate the entrepreneurial function provides a sharp demarcation test for different kinds of theory of an economy. Moreover, the matter of entrepreneurship has wider implications and here the central problem is not how we deal with economic change but how we deal with change generated within the economic system as distinct from change imposed upon it from outside. Why do we conceive of entrepreneurial economies as self-transforming economies? The modern characteristic of ceaseless change is not characteristic of earlier times. What is it about the process of modern capitalism which makes it so revolutionary, perhaps too revolutionary for its own long term good? Our suggested answer is that the dynamic of modern capitalism lies in the combinatorial growth of knowledge and investment opportunities combined with the instituted frameworks of the market economy that taken together simultaneously stimulate and enable entrepreneurial activity. Here there is a paradox, with which any observer of modern economics must contend. Entrepreneurial behaviour is pervasive yet economic theory, with one or two very

significant exceptions, has virtually nothing to say about either its significance or about its origins. This is a pity for the failure to treat the entrepreneur seriously cuts off research and advanced teaching in economics from the central dynamic of modern capitalism, its restless, searching, experimental nature; and renders it particularly difficult to teach students of business the significance of the economic institutions that define the modern world. In this brief essay, I will explore this conundrum and suggest that bringing in the entrepreneur means pushing out several of the cherished methodological stances of modern economics.

I will conclude with the claim that only an evolutionary stance on the economic process can give the entrepreneurial function its due place in our thinking. If that is contentious, so be it, the contest between ideas is itself an entrepreneunal, experimerital and evolutionary process.

2. THE ENTREPRENEUR

It will help to begin with a definition of what the activity of entrepreneurship consists. We may begin very broadly, defining it as the activity of creating and implementing a new business plan, in many cases but not all cases reducible to the creation of a new business entity, the prototypical small firm. Consider first Baumol's, (1990) definition of entrepreneurs as, 'Persons who are ingenious and creative in finding ways that add to their own wealth, power, and prestige'. From this follows the idea of the entrepreneur as the agent responsible for conceiving and implementing new business plans, plans to create wealth, power and prestige. Since plans require resources for their activation, we find an easy transition to definitions such as that provide by Mark Casson, who defines the entrepreneur as, 'someone who specializes in making judgmental decisions about the allocation of scarce resources' (Casson, p. 151). If it is the nature of the judgmental decisions that matters, then, as Ripsas (1998) suggests, they have three principal attributes: their innovative nature, and by implication their connection with new knowledge; the uncertain prospects attached to them, and thus their dependence on partial knowledge; and, finally, the extraordinary profit rewards that can follow from implementing these decisions and thus their connection with radical knowledge.

Such a broad perspective is useful as a starting point but it clearly needs some sharpening if it is to be useful, for any change in business activity falls within this remit; it is, at once, too broad and too narrow. It is too broad because we would want to exclude changes in business arrangements that are purely adaptive responses to changes in the economic environment, accommodations within an existing business framework. If when the price of copper increases, makers of electrical cables substitute aluminium as the material of choice, we would not normally consider this to be entrepreneurial, merely good stewardship of existing economic resources. Similarly, the founding of any new business stretches the notion of the entrepreneur too far. Many business ventures are copies of existing businesses whose function is to ensure the continuity of economic activities through time, they are based on knowledge of well established markets and practices, and in that sense bring nothing new to the economy. While they require resources to be marshalled appropriately, and while they inevitably carry the risks associated with the newness of the venture, they are entrepreneurial

to a negligible degree. On the other side of the account these definitions are to narrow, for they risk excluding entrepreneurial activity based on teams working within existing enterprises, and excluding entrepreneurship in non economic contexts, and in the context of public enterprise (Baumol, 1990; 1993). We also need to acknowledge that not only the business leader can be entrepreneurial. Indeed, to give one example, there is an enormous gap in our thinking about the entrepreneurial role of the consumer in the modern economy, in deciding for what particular goods are used. Thus, a working definition needs to go beyond the idea of passive adaptation in known knowledge frames, to focus on the positive element of novel conjectures that bring new knowledge or beliefs into economic application. The point about these conjectures is that while they may have a partial basis in knowledge, they rest in large part on beliefs that are yet to be tested, to be confirmed or falsified. This inevitably brings the definition closer to the Schumpeterian conception of new combinations of resources that include a basis in new technology but are not limited to that. The business conjectures that Schumpeter noted also extend to new markets, new forms of organization and the discovery of new natural materials and they explicitly, and unfortunately, de-emphasized the role of the entrepreneurial consumer. It is not useful to equate entrepreneurial activity only with technology based business opportunities even though these are important, and in the case of many famous technology-based entrepreneurs such as Edison (Millard, 1990) or Sperry (Hughes, 1971) central to their achievements. We shall say more about the Schumpeterian dimension in a moment but one or two other preliminary remarks are in order.

The first is that an understanding the entrepreneurial function cannot be separated from the nature of the economic system in which it is exercised. Its nature and consequences are embedded in the wider system of market and non-market economic institutions. The prevailing features of a market economy produce a particular spectrum of entrepreneurial activities in a different set of institutional arrangements, say of labour managed firms, or of stakeholder capitalism, the entrepreneurial spectrum will take on a different hue because those systems give different meanings and content to entrepreneurial activity and provide different incentive systems from shareholder capitalism (Adaman and Devine, 2002).

What, then, are the instituted features of modern capitalism that create such a strong symbiosis with entrepreneurship? They are four in number. The first of these is that of the open market in which every established business position is open to challenge, unless protected via a patent, copyright or other limitation. If we see competition not as a state of affairs graded by the structure of the market but as a dynamic process of rivalry and struggle for a share of the market then entrepreneurial activity is both necessary and sufficient to create competition. The general rule is that any market can be entered, provided the business idea is good enough and provided incumbents do not create sufficiently onerous, artificial barriers to entry. Indeed competition authorities in the advanced economies spend a good deal of time preventing incumbent firms artificially closing off their markets to entry. Indeed, it is rather obvious that since any entrant incurs costs there will usually be some compensating entrepreneurial advantage in product design and quality, method of production or scheme for distribution to customers that puts the incumbent at a disadvantage vis a vis the new source of competition and which helps circumvent entry barriers. In this sense, entrepreneurship is pervasive because the idea of an open competitive market process is pervasive. A firm never quite knows where the threats to its existence will come from; and frequently they come from such unanticipated directions that their significance is discounted until it is too

late. Secondly, markets play fundamental roles in relation to the incentives for and rewards to entrepreneurial behaviour. The prevailing market based valuations of products and productive services allow the prospective entrepreneur to gauge the potential profitability of a new venture by virtue of its having to fit into the current pattern of activity. Market signals matter not only in the sense of encouraging the efficient use of existing business knowledge, the traditional argument in favour of the competitive organization of industry, but also in the deeper sense of guiding the competitive process of entrepreneurial change.

Without prices no entrepreneur could judge that a business conjecture is potentially viable: he would be doubly blind, not knowing whether either the quantity conjectures or the value conjectures on which the plan depends are plausible. Markets generate this information and thus connect new beliefs with existing patterns of resource allocation. All entrepreneurial conjectures compete with some existing activity even if the true margins of competition are initially misconceived and revealed in surprising ways ex post Notice that this remains true even for those radical entrepreneurial conjectures that, for example, introduce products previously unheard of. Even these products must be conjectured to displace existing products in consumers expenditure and to utilise resources employable elsewhere in the economy. Even if the radical reconfigurations of demand and reallocations of resources that flow from truly radical innovations cannot be foreseen, the starting point for the entrepreneurial process surely can by virtue of existing market relations. Of course, this is to claim nothing more than the significance indeed necessity of an element of continuity in the economic process, new activity always builds on an existing base, in this sense, all change is cumulative as Marshall's famous epigram, 'natura non facit saltum' reminds us. Thirdly, markets are instituted devices for generating low cost access to consumers and productive services.

Markets are structures for indicating the terms on which resources are available and open markets for skilled workers and for free capital are essential to an entrepreneurial economy and, without them the possibility of entrepreneurial behaviour will be greatly circumscribed.

Thus, there is a close correspondence between the institutions of the market place and the spectrum of entrepreneurial behaviour it engenders and supports. Consider, for example, the institution of the patent right. Patents provide important incentives to entrepreneurs in that they protect a market opportunity for a circumscribed period. They protect against the narrow imitator who merely seeks to copy a novel idea but this protection is not absolute. Any patent can in principle be invented around, indeed the requirement that a patent be published indicates to potential inventors exactly what inventing around would mean. The entrepreneur who bases a rival business on a different novel idea may thus destroy the economic basis of an established patent. Patents are an extremely clever institution, their protection is important but it is not unlimited, and deliberately so, and it is helpless in the face of other genuinely novel entrepreneurial actions. This takes us to the fourth and final aspect of the institutions of a market economy, the incentives they provides for entrepreneurship.

Whether or not profits are the primum mobile of the entrepreneur, there can be no doubt those profits are a necessary feature of such activity and that their prospect is essential in the process of attracting risk capital to support conjectures for which there cannot be any basis in fact. Novelty may be its own reward but novelty is also the signal that what the entrepreneur does is economically superior to already established competing activities.

Abnormal profits, far from being an index of the absence of competition, are the very proof that competition is actively pursued, that resources are being reallocated. This is the

crucial role that profits and losses play in the mobilization of changes in economic structure by focusing on competitive equilibrium we hide this from view.

The second point we must address briefly relates to the wider significance of entrepreneurial activity, in pointing to the particular mechanisms of economic change in modern capitalism.

The fundamental issue here is that economic growth is never steady advance with all activities expanding at the same rate, as the prominent, aggregative theories of economic growth would have us accept. For then, scale apart, one year is identical to the next, whether growth is positive or negative makes no difference. By contrast, we know that growth always follows on from development, from changing the economic structure quantitatively and qualitatively. Not only do activities change in relative importance, their absolute scale changes unevenly, while many grow absolutely others decline absolutely. The other side of the creative entrepreneurial coin is that activities disappear from the economic scene, that we cannot put resources to new uses without scaling down the old uses. In short, a theory of decline in economic activities is an integral part of any useful theory of economic growth.

Intuitively, or at least with a reasonable knowledge of the history of the last two centuries, structural and qualitative change seem to be inseparable from the economic process. The economic world of today bears little resemblance to that of 1960 even more that of 1903 or 1803 in that the entire pattern of production has changed as new products and methods of making them using new kinds of material and energy appeared, and old ones disappeared.

Thus, patterns of resource allocation become radically different over time, the activities and economic ways of life of consecutive generations bear little resemblance to each other, and patterns of consumption include practices and purchases that would be undreamt of by earlier generations. Even in 1960, would many have imagined let alone believed that the desk-top computer would be almost as ubiquitous as the television in the households of a modern economy? Who in the 1930s would have foreseen the role of the television in destroying the cinema industry or would have imagined the effect of the refrigerator on patterns of household living? Few modern homes are lit by coal gas, not so in 1910, a virtually negligible proportion of the population today works directly on the land, not so in 1870, and very few make the trip from Europe to New York by ocean liner, not so in 1920.

Indeed, industrial museums proliferate and are an established part of the cultural framework in many advanced economies; and one should reflect on this as a marker of the nature of capitalism. Less happily, whole regions and cities exist with their economic raison d'etre eliminated by the entrepreneurial process; the negative side of restless capitalism is that it is an uncomfortable system in which to live. The record, in this long-term perspective, appears to be one of radical discontinuity such that any comparison of a single economy over extended time is fraught with difficulty. Growth never happens without development and the ongoing radical redevelopment of the economic structure so that economic change is always uneven within and between countries. As Simon Kuznets has argued (1977), these economic features partly reflect the role of the scientific revolution as an entirely new engine of economic change. However, we should not lose sight of the fact that scientific work and entrepreneurship are entirely different though complementary and that it is the latter, which gives to science its modern economic significance, not the converse.

However, entrepreneurial activity is not simply about change even in the general sense referred to here. The more important point is that entrepreneurial change refers only to change that arises from within the economic process, change that it is stimulated by and

made possible by the institutions of the modern market economy. Change of this kind is a non-equilibrium phenomenon and it cannot be understood by the methods of comparative statics or dynamics, for these always refer to the consequences of changes that arise from without the economic system. This we recognize as Schumpeter's great insight, that entrepreneurial led change is based on a process of the internal, self-transformation of the economic system. This process may have no attractors of any kind, it may be truly open ended, historical and entirely unpredictable in its effects. To understand the basis for this argument is indeed an enormous challenge but, unless we make the effort, the role of the entrepreneur will remain elusive and worse, marginal to economic thinking. Moreover, we will never come to understand the process of economic development or why it is so unevenly distributed around the globe and thus comprehend the reasons behind several of the major moral issues of our times.

To explore this further we first provide a brief account of the two contrasting theories of economic entrepreneurship associated with Schumpeter and Kirzner respectively. We then turn to the characteristics of modern economic theory, which preclude the inclusion of the entrepreneur, leading to the claim that the root cause of the difficulty is their underlying approach to the nature of knowledge. We conclude, first, with a brief assessment of how the entrepreneur and the manager can jointly contribute to an understanding of restless capitalism, and secondly, with the claim that the entrepreneurial process is an evolutionary process.

3. CONTRASTING THEORIES OF THE ENTREPRENEUR: DESTRUCTION AND CREATION

Even among economists who recognize the prime importance of the entrepreneur there are contrasting perspectives to be contended with. The best way to illustrate this is to outline the positions of two of the acknowledged dominant figures, Joseph Schumpeter and Israel Kirzner, Austrian economists of very different persuasions. Let us begin with a brief account of Schumpeter's theory of the entrepreneurial features of capitalism, features that cannot be separated from his theory of innovation and the role he gives to innovation as the primary internal element in the evolution of capitalism. This summary is drawn from his 1939 Business Cycles rather than the more frequently quoted Theory of Economic Development although with exceptions noted below the two accounts are very close. The starting point is his claim that innovation is logically separate from invention and that it is entirely immaterial whether innovations involve any element of scientific novelty. Innovation is a purely economic process in terms of cause and effect and involves nothing less than putting available resources to new uses. The important aspect of Schumpeter's analysis is that it brings together stability in the capitalist order with instability in the capitalist system. The continuous transformations in economic form are associated with the creation and application of new combinations that arise from within the otherwise relatively more stable order of overarching institutions (Schumpeter, 1928). As he expressed the point, Schumpeter's

> … what we unscientifically call economic progress means essentially putting productive resources to uses hitherto untried in practice, and withdrawing them from the uses they have served so far (p. 378, emphasis in original)

concept of innovation is supply oriented, consumers are claimed to be passive elements in the innovation process merely adapting to the offers provided by firms. Innovation occurs in the sphere of production and the new combinations that define innovations express themselves in changes in input output relations or in production functions and so redefine cost and productivity relationships. Generally, he argues, this involves the construction of a new plant embodied in a new firm founded for the purpose and the rise to leadership of new 'men'. Innovations do not typically come from old businesses and when they are associated with established businesses, they involve new forms of internal organization.

This process is a competitive process in which old firms either adapt to the new competitive circumstances or decline and die.

The phenomena produced by innovation are quite different from those associated with the growth of population of capital accumulation around existing lines of business activity and cannot be treated as an extension of the accepted theories economic organization, such as those associated with Walras or Marshall. In response to innovation, the most complete command of routine counts for nothing for the effects of innovation are kaleidoscopic, they render existing views of the world redundant. However, the path to entrepreneurship is never easy and three reasons for this are adumbrated, resistance to new phenomena on the part of the threatened parties, difficulty in acquiring resources or changing consumer behaviour, and the human barriers to committing to a new path of behavior. However, once an entrepreneur has shown the way, other less entrepreneurial followers imitate the pioneer and establish a competitive process in which the innovation discovers a niche in the economic framework.

The effects of this process are distributed unevenly across the system and over time, in many cases, railroads, electrification are favorite examples, imposing major adaptive responses on the economy so that it becomes a different economy. Disharmony is inherent in the very modus operandi of innovation-based evolution, and this cannot be described, let alone understood, in terms of sequences of comparative static adjustments to exogenous changes in economic data.

In Schumpeter's scheme, enterprise is the activity of carrying out innovations and the individuals who do so are the entrepreneurs. The latter are distinguished from the mere head or manager of a firm and their function is not to be confused with a type of individual. The same individual is typically entrepreneur and non-entrepreneur at different points in her business activity and all he permits himself to add is that entrepreneurs are usually found among the heads or owners of firms, and are often the original founders. Not only is the entrepreneurial function different from the inventive function, neither is it equated with the supply of free capital or the bearing of risk. These may be complementary parts of the innovation process but they are logically separate.

The deeper economic significance of the entrepreneurial process is that it transforms an economy from within, creating a new pattern of relative prices and thus altering the incentive structure facing subsequent entrepreneurs. It is a process that is irreversible, open and path dependent in its effects. Innovations are introduced in the context of a prevailing price structure that validates the innovation in terms of profitability. Of those that pass this test and earn economic profits proper, a process of competitive entry follows which expands supply and destroys the profits as the economy adapts to a new price system. As Schumpeter so graphically expressed the matter, profit 'Is at the same time the child and the victim of

development' (1934, p. 154). Not only are profits uniquely connected to innovation, they also form the principal source of saving and the basis for private family fortunes and the growth of new business dynasties. Entrepreneurial capitalism is clearly an uncomfortable place and it is not surprising that entrepreneurs should seek to protect their profits from the effects of competition and be willing to sabotage the innovative effects of others.

One of the most important and least explored aspects of Schumpeter's theory is its precise location within the institutions of a monetary economy with its panoply of banks and credit instruments. The entrepreneurial 'new men' do not normally own the means of production, the fixed and working capital to establish the enterprise, and so they must turn to the banks to extend credit, often when no collateral exists. The banks must be independent agents without stake in the gains of the enterprise other than those contracted for in the loans granted and it is the existence of the need to finance innovation that makes the interest rate positive.

At a minimum innovation is the pillar of interest, it is index of the rate of development after correcting for changes in the general purchasing power of money That Schumpeter should locate his analysis within the institutions of a monetised, credit economy is of immense importance for it underpins the radical, transformative nature of the entrepreneurial process.

Via access to credit, entrepreneurs sidestep the hold on resources of established businesses and are able to prise away those resources and deploy them in the new combinations. It is indeed difficult to see this happening with such ease in a barter economy.

In this sketch of the mature Schumpeter's view, we find many of the themes that have absorbed the time of subsequent scholars of innovation and the entrepreneur. Entrepreneurial activity is the introduction of novel change into the economy, novel meaning not previously known in that context. More than that, it is intrinsic to the idea of novelty that it cannot be foreseen or reduced to an expression of calculable risk; hence the view that the entrepreneur deals in radical uncertainty. Since the consequences of novel ideas cannot be predicted in advance, it follows that all entrepreneurial plans are blind variations in Campbell's sense.

To what extent are entrepreneurs different from artists more generally, only in that their conjectures are about business plans. However, there is much more to the entrepreneurial function than having novel thoughts. The entrepreneur must bring the conjecture to fruition in a working business organization for it to be tested by the market, and thoughts must be turned to profitable action if the conjecture is to be of consequence. The entrepreneurial function necessarily extends to the ability to assemble the requisite productive resources, engage with the potential consumers and organize the business. Thus, the idea that what is unique to the entrepreneurial function is business leadership. Here we find the modern emphasis on the new small firm as the prototypical vehicle for entrepreneurial action, and more precisely the new technology based firm. For, if entrepreneurship is equated only with business leadership, all business-founding events fall into the net, yet only a few of them will be transformative in the novel sense that Schumpeter meant. Most will be the continuation or minor imitation of established business ideas necessary to preserve the replication of the existing structure of the economy rather than transform it. From a Schumpeterian perspective, these should be excluded from the ambit of entrepreneurship and leadership. We should conclude not that leadership is irrelevant but rather that it s only one component in the Schumpeterian view of the entrepreneur. For Schumpeter's aim was to explain the radical self transformation in the activities and structure of modern capitalist economies as a whole,

the entrepreneur as mere business leader does not capture this view at all adequately. There is a further aspect to Schumpeter's framework, which resonates in the modern world, that of the supply of capital to the prospective entrepreneur; not through the banking system but through capital markets more generally and venture capital markets in particular. The ideas of business angels, of specialized stock markets in which investors can realise their investment exit through an initial public offering, and of corporate venturing by large businesses are newly instituted variations on the Schumpeterian theme that credit markets matter in an experimental economy.

The Schumpeterian perspective on the entrepreneur has provided a compelling framework for many scholars whose central interest is the economics of innovation (Andersen, 1994; Dosi, 2000; Metcalfe, 1998; Nelson and Winter, 1984). However, it is not without its rivals, indeed, an entire School of Austrian inspired thought, associated in particular with Israel Kirzner (1978), stands as a formidable challenge to the innovation based perspective.

Whereas Schumpeter gave the entrepreneur a narrow focus, for the Austrians more generally, the entrepreneur is pervasive and fundamental in economic terms, indeed markets cannot work without entrepreneurs. As with Schumpeter there is an emphasis on radical ignorance, a complete unawareness of information that is relevant to choice and action, but the conclusion draw is rather different. What defines entrepreneurship is alertness to situations where resources are under or overvalued. Pace Schumpeter, the entrepreneur does not create economic uncertainty; rather she overcomes the effects of radical ignorance by eliminating market errors. For Kirzner this is the core of the market process. The limited understanding of individuals, arising from the uneven distribution of economic information creates multiple arbitrage opportunities where products and resources are incorrectly valued in their current uses. The alert entrepreneur spots these opportunities and carries out the steps to eliminate the inconsistencies they imply. Thus whereas Schumpeter's emphasis is upon the disruption to established economic practices implied by innovation, for Kirzner, entrepreneurship is a non-innovating, cohesive, equilibrating force in whose absence the market economy could not work. Profits accrue to the entrepreneur but these cannot be related to the value of any resources, instead they are the reward for alertness, for making the correct conjectures. It follows that economic equilibrium is the end state in which no discoveries remain to be made and this is a highly implausible state of affairs. For perfect knowledge is an unattainable situation precisely because learning processes are individual and idiosyncratic, they have no collective limit and the context of learning is the market process itself. Thus, the entrepreneur as innovator is contrasted with entrepreneur as market arbitrager, two quite different takes on what entrepreneurship means; if one is destructive, the other is constructive, yet in construction the conditions for further destruction are created.

It is easy to overemphasize the differences between these different perspectives, perhaps instead we should recognize that any workable notion of entrepreneurship will have to cover a spectrum of possibilities. Eliminating unexploited gains from trade in the context of existing activities may lack the glamour of the hero entrepreneur, but is equally contingent on the exercise of imagination, equally contingent on the ability to form conjectures about different possible future economic worlds, equally dependent upon a faith in and commitment to non- scientific statements that may turn out to be false. Both entail a view of competition as a discovery process that changes the discoverer. For neither Schumpeter nor Kirzner is

entrepreneurship a factor that can be supplied in measurable units. It is an attribute of individuals, an attribute of discovering which is not amenable to rational optimizing calculus (Ripsas, 1998). Finally, they share a common perspective of fundamental importance, the experimenting nature of the economic process. More than anything else, entrepreneurs are the creators of new economic experiments and it is this aspect that enables us to identify the two dimensions of entrepreneurship which make it fit so uncomfortably with modern economic theory, namely its relation to the growth of knowledge, and, the impossibility of fitting it within a equilibrium framework of economic action.

4. DISCOVERY AND KNOWLEDGE

What is unique about each entrepreneur is that she has perceived a different view of the world, a view that is the basis for differential economic action. Entrepreneurs believe something that nobody else believes, and do so with sufficient strength of mind to act upon the belief and commit economic resources to a business plan. This belief must be grounded in the understanding of the individual concerned and this understanding must be grounded in that individuals' knowledge of the existing economic world. To say that the entrepreneur is blind to the consequences of action is not at all the same as saying that the entrepreneur acts randomly. Quite the contrary, for the reasons adumbrated above, entrepreneurs are guided by the market system in respect of the innovations they propose. All knowledge is, of course, entirely private, it only exists in the form of electro-chemical states in individual minds and brains. Knowledge never appears in the public domain it is always in this sense entirely tacit and private. What is in the public domain is the representation of that knowledge, almost certainly imperfect, in the form of information whether verbal, sensual or codified in storable written form. That information can be codified and that we, as a civilization, have developed sophisticated languages, including mathematics, to code and decode information is, of course, a central fact in the development of modern entrepreneurial society. A growing body of public information has been made available that is storable across time and transferable across space and thus available for the use of future generations and generations in different locations. The growth in this stock of information opens up enormous opportunities for the combination of different pieces of information and thus for the growth of new knowledge in individual minds. Indeed, the significance of this distinction between information and knowledge is fundamental to the growth of the latter. Knowledge always grows through thought experiment in individual minds but this process is greatly influenced by the information to which those minds have access too. The growth in the availability of stored information greatly enriches this process of knowledge growth but is itself insufficient to comprehend the dynamic of the process. What social and economic life in general depends upon is the emergence of correlated knowledge, more safely correlated understanding, across individual minds. Only when individuals understand in common can they act in common. Thus the emergence of social rules, of theories of public action, of theories of nature, of theones of technology, has been central to modern economic growth, as explained above. Every economy depends on high if localized levels of correlation of understanding, exactly as Adam Smith described in his account of the division of labour. Modern societies devote significant

resources to the process of correlating understanding through education and of reinforcing these correlations through ideas of law and acceptable rules of behaviour. However, a world in which every individual new the same as any other individual would be a world of stationary knowledge. Indeed, it would not be a world in which individuality could be given any substantive meaning. Knowledge grows because it is individually grounded, because individuals react differently to the same information and transmit the new thoughts to others in a continuous process of communication and challenge. Out of this process comes understanding in common, correlated knowledge, of which the processes that generate science are typical examples. Now the chief characteristic of the Schumpeterian entrepreneur, in science as in economic life, is to de-correlate private knowledge, to sow doubt where previously there was understanding in common. Hence, the emphasis on novelty, on challenging existing practices and understandings that is typical of the Schumpeterian model and typical of the Kuhnian notion of the paradigm- breaking scientist. The role of the swarm of imitators, and of the Kirznerian entrepreneur, is to reestablish a sufficient degree of correlated understanding around the new activity to ensure its spread into the economic system as the appropriate niche is discovered. Thus, entrepreneurs have a dual role. They claim to know differently from others and they challenge the correlated understanding that others possess. The successful among them generate new patterns of understanding in the use of resources, pattern changes that underpin economic growth. In this regard, there can be no more unfortunate idea in economics than that of knowledge as a public good.

Information is a public good but knowledge is always private. It is on this distinction that an understanding of the entrepreneur rests, as the individual who dares to have thoughts not held by others, who challenges the basis of their economic and social co-operation. No wonder they are rarely thanked for their pains.

That the entrepreneur is the locus of experimentation in the generation of new knowledge also helps explain the restless nature of modern capitalism. Economies can never be at rest because knowledge is never at rest and the prevailing pattern of understanding is always being subjected to challenge. By acting entrepreneurially, an individual generates new information that may lead others to see the world differently in a distributed process of knowledge growth. What is distinctive about modern society is its institutionalization of this process of repeated challenge to existing patterns of knowledge correlation (Gibbons et al, 1994). Of course, all economies are knowledge and information economies and could not be otherwise. What is distinctive about modern times is not only the development of social technologies to correlate understanding but the substantial investment in physical technologies to store and communicate information, greatly widening the number of individuals who can fish in the common pool. In such conditions, contemporary views of the world are challenged on a widespread basis and one would expect the number of entrepreneurs to be increased substantially as a result. The disruption of existing economic arrangements is thus built into modem capitalism in a fundamental way. In part through the growth of science but more fundamentally, through the operation of the market process itself. An explanation of this point requires some further elaboration of current trends in economics.

5. THE MARKET PROCESS

The famous definition of economic theory provided by Lionel Robbins (1932), that it is a set of principles to govern the disposition of scarce resources to the satisfaction of unlimited ends, turns out to leave no room for the entrepreneur. In part, this is a result of the associated emphasis on rational calculation in known circumstances but much more fundamentally, it is because of the role that the idea of equilibrium plays in this scheme of thought.

When resources, the preferences of final consumers, and the available productive and organizational knowledge are given, a set of prices are identified that permit all individuals and co-operating teams to fulfill their plans to buy and sell inputs and outputs to the letter.

Such an outcome is defined as, a market equilibrium relative to the determining data.

Now as Baumol (1968) made clear, such a framework has no room for the entrepreneurial function; what it needs is management, the husbanding of the scarce resources in the most economically efficient way as determined by market price signals. Management makes routine decisions within known constraints to meet established objectives, it involves the stewardship of the resources owned or contractually controlled by the firm by the firm, and the managers are rewarded according to the value of the productive services they provide, just like any other form of labour. The managerial function is primarily one of rational calculation of the course of action that meets the objectives of the owners of the firm, usually assumed to be the maximization of profits or residual income and to implement policies to achieve this. Clearly, the constraints and objectives considered by managers must be known with sufficient precision to permit these Olympian calculations. Management is quite consistent with the search for incremental improvements in economic efficiency, in response to changes in the economic environment but these responses are passive as distinct from initiatory, they involve mechanical application of established rules to already established activity. A very considerable portion of modern economic theory replicates this view, however sophisticated the argument may be, the fundamental frame is one of rational optimization in the presence of given constraints or given constraints generating constraints, and adaptation to impose a new optimum when these constraints change In this scheme, there can be no problem of knowledge per se. From this perspective, the managerial function is everything that entrepreneurship is not It takes the frame of action as given, and its task is to reduce uncertainty to calculable risk (Schon, 1965). In fact, we can go further, the structure of this kind of economic theory rules out any consideration of the entrepreneur as a matter of its logical structure.

The root cause of the difficulty is the notion that markets are in equilibrium in the sense that there is no internally generated scope for change, from which follows the necessity of explaining all economic change by exogenous changes in preferences or resources or technology. If equilibrium means a state of rest relative to the given data, then all change is without an economic explanation, for if decisions are correct and mutually consistent there can be no internal reason to change them. If this is the core of the theory of market equilibrium, we must immediately recognize it as fundamentally different from the theory of the market process. In the Schumpeterian and Austrian perspectives, markets do not generate equilibrium they generate order, they solve a problem that of allocating resources to meet needs but that order necessarily generates its own internal reasons to change. All

patterns of order in a modern, entrepreneurial economy are necessarily transient, they are continually destroyed from within, they are naturally restless. This change in view is not a matter of semantics but a fundamental difference in perspective and understanding of the underpinnings of economic activity; an understanding of the role that the entrepreneur plays in bringing new knowledge into the economic process. Order, a coherent economic structure that 'solves' the resource allocation problem more or less satisfactorily, is not equilibrium because every economic order necessarily generates the means to change that order and does so from within by the creation of new knowledge and the stimuli this gives to new business conjectures. Order is the solution to a problem that in its emergence changes the problem.

The day today flow of economic activity necessarily generates flows of new information, which influences the minds of countless individuals, some of whom are then stimulated to conjecture new economic arrangements. Those who are able to act on these conjectures are acting entrepreneurially and their actions change yet again the flow of information generated within the economic process. This is why economic change is fundamentally endogenous.

To claim that a market or an economy is in equilibrium, would be to claim that no new conjectures where forthcoming, that new thoughts had ceased to flow everywhere in the economy, that from the epistemological viewpoint the system was perfectly correlated and dead. Thus the fundamental problem; economic order is economic equilibrium only when it is assumed that knowledge is stationary, or when we abstract the economic process for its epistemological underpinnings. To do so is to disassociate the economic process from the nature of human kind and if we do this, we should not be surprised if the entrepreneur and the associated problems of profits, losses, hopes and disappointments, growth and decline disappear from view. This is the force of the claim above that all economies are knowledge-based economies and could not be otherwise and that knowledge is never, nor ever could be, stationary. This is the essential point about entrepreneurial activity, it reflects the fundamental nature of human knowledge and the consequence that economic knowledge does not exist separately from an economy. From our evolutionary perspective knowledge and the economy are mutually constituted and they co-evolve.

This confusion between order and equilibrium is undoubtedly grounded in the belief that allocation has a rational, constrained means unlimited ends explanation. Brian Loasby (1998) has captured this point with his usual perspicacity, when he points out that discretionary behavior is essential to innovation. We cannot allow for the entrepreneur if we seek to pre-programme choice in its entirety. Then there is only the rational, mechanical response, no role for imagining different economic worlds and no escape from the tyranny of optimization.

This does not mean that calculation is irrelevant only that the choices and the constraints are not always obvious or perceived in the same way by different individuals. From an evolutionary perspective, what matters is not optimization per se but differential optimizations in similar circumstances. In short we can find a place for the entrepreneur only if we see economic order as a lived experience in which flows of information are generated to confirm or challenge existing beliefs and thus to change knowledge and its distribution.

The tendency of modern economics to ignore this perspective is reflected in another of its methodological dimensions the resort to the representative agent as the embodiment of all that is necessary to define an economic equilibrium. It goes without saying that this device eliminates the possibility of the entrepreneur at a stroke, since to act entrepreneurially is to

engage in novel economic action, action that is necessarily non-representative. Quite obviously, innovation of any kind is impossible to imagine in such a scheme. To incorporate the entrepreneur is to recognize the immense diversity that characterizes economic action.

Such diversity can be captured, as Alchian (1950) suggested, in a statistic such as the mean, median of mode of the relevant distributions of behaviour but, the point is, such representative statistics cannot be defined ex ante, they are the emergent outcomes of the economic process. Thus, equilibrium and the representative agent are two of a kind they are used because the theories in which they are embedded have no role for internally driven change, no role for the entrepreneur, no role for the embedded growth of knowledge.

These difficulties are amplified in a third area, that of an analysis of the path to equilibrium following some exogenous changes in data, the material of many an undergraduate exercise.

Here it is essential to know whether the system in view is stable or not, if disturbed will it follow a path to a new state of rest. Two problems immediately arise. The lesser of the two is that the theory of rational behaviour that defines an equilibrium does not carry over to explain how the agents in the economy respond to being out of equilibrium. The speed of response to out of equilibrium circumstances is in this sense arbitrary, it has no rationalization in the underlying theory. Nor can it, this is the nature of an equilibrium theory. Kirzner understood this well and we have seen that his class of entrepreneurial theory is designed to explain how out of equilibrium situations are acted on entrepreneunally. However, limited this explanation might be it does deal with the latent schizophrenia that results from otherwise rational individuals following non-rational adjustment processes. Kirzner's entrepreneurs are rational, not in that they maximize in a narrow sense but that they are alert to profit opportunities. The second difficulty is more fundamental, and it concerns the assumption that the position of equilibrium is invariant to any non-equilibrium motion around it. How can this be? Surely, only if the experience of non equilibrium situations conveys no new information to the market participants, that is to say, only if we again and quite unjustifiably, separate the generation of knowledge from the economic process. As soon as this assumption is dropped, we must recognize that all market orders are path dependent and indeed the possibility that the evolution of the market order is entirely open ended. There may be no economic attractors for the very process of approaching them will destroy them. Only history and motion remain but always in the context of market order.

6. MANAGERS AND ENTREPRENEURS

This is a useful point to dwell a little further on the distinction drawn above between entrepreneurs and managers, particularly in view of the possibility that the manager can live quite comfortably in an equilibrium world whereas the entrepreneur cannot. While it is essential to separate the two categories of entrepreneur and manager as functions, in reality it is difficult to do and risks obscuring the importance of different kinds of entrepreneurship and of disconnecting the firm from the knowledge through which it is constituted. Thus when Baird (1994) defines the entrepreneur as 'a person who assembles all the resources physically necessary for the production of a good which he then resells to consumers' (p. 144), this risks equating entrepreneurship with management tout court. Not surprisingly, the demarcation of the two activities has been contested terrain.

Hartmann (1959), for example, argued that entrepreneurship is a type of management that it is pervasive and, pace Schumpeter, it cannot be equated solely with the introduction of innovations in the economy. As a species of management within organizations, its distinguishing characteristic is leadership, the making of decisions of strategic importance. What distinguishes the manager with entrepreneurial attributes is its possession of formal, non- functional, ultimate authority associated with the performance of non-routine activities. Here there is a close connection with the Weberian idea of bureaucratic leadership in which authority is linked to charisma, a particular skill at leadership and the motivation of others. In turn, authority is linked to broader cultural traditions including the acceptance of rights in private property. From this perspective, entrepreneurship is distributed through the higher echelons of an organization and is effectively equated with discretionary behaviour to instigate processes of change and set new goals in the organization rather than organize established activity. In this view, there is considerable overlap with Eliasson's idea (1990) of the top management team as the locus of entrepreneurial activity.It is the top team that enjoys discretionary behaviour to create the templates of rules that others in the firm must work too. Ulrich Witt (1998) has also argued that the entrepreneur's role is to generate a different model of business and to have the leadership skills to ensure that the other members of the firm internalize the model as their correlated framework for understanding. An entrepreneurial theory of the firm presupposes organization but also a sense of purpose and motivation, leadership and charisma for short, not only routines but a conceptual framework in which the business opportunity can be developed further. As Witt rightly suggests, entrepreneurship must be understood in the context of bounded rationality to reflect the judgmental nature of entrepreneurial beliefs and the limiting effect of cognitive frames and their filter effects on information (Fransman 1994). Members of the firm have to coordinate their actions and this requires a correlated degree of understanding. Not everybody need understand everything that happens in the firm, indeed such a requirement would prevent a division of labour, but these happenings must be connected, again through the role of the top management team.

As in the economy more widely, so in the firm, knowledge is not the preserve of anyone individual but of the group that defines as the firm. How to use widely dispersed knowledge reflects the organization as a distributed knowledge system (Tsoukas, 1996). Now the correlation of knowledge and beliefs is a social process, by interacting and observing others by sharing experiences together coordinated, ordered action is made possible. Thus, we may see the organization of the firm as the operator that simultaneously ensures managerial correlation of understanding across its activities while leaving open the possibility of entrepreneurial action to de-correlate those understandings. Not surprisingly, this is exactly the function of the market system as a whole, to permit evolution within order. The higher order correlation required for management requires a shared cognitive frame, the top cognitive frame that must encompass the business plan in all its dimensions. Yet any frame is a set of blinkers too that limits the scope for new thoughts and beliefs. Hence, one of the central problems faced by any firm how to frame its activities efficiently and effectively while permitting flexibility to external pressures and simultaneously being open to entrepreneurial conjectures. Thus, just as entrepreneurship and the market process are complements so are entrepreneurs and managers. From this follows the difficulty of seeing the entrepreneur as an ideal type embodying unique traits, the importance of placing the entrepreneur in social

and organisational context, and the need to understand the trade offs and incentives that result in managerial or entrepreneurial action from the same individuals (Thornton, 1999).

If we take this view of entrepreneurship, what view of the firm follows to parallel the view of the market? As a starting point, it is surely clear that firm and market are not substitutes but complements, and that firms can achieve outcomes that are entirely beyond the scope of markets. Markets are about processes of exchange but firms are about the combination of resources for specific productive purposes. The firm is more than an allocating device, it is the locus of decision about what to do and has the unique role of defining and combining the multiple kinds of knowledge required to fulfill the productive function. Thus, firms have to combine knowledge and resources having first made a decision as to what it is that is to be produced. It is simply an error to imagine that markets can do the same.

What is specifically important about the entrepreneur is the vision of new resource combinations and the capacity to articulate such visions in practice through the creation of a productive organization, drawing on markets as necessary. Thus, as Schumpeter argued, and resource based theorists have subsequently elaborated (Alvarez and Busenitz, 2001), innovations require new combinations of resources, the creation of additional heterogeneity in the economy. Edith Penrose (1961) still provides the best line of advance for this way of thinking about the firm with the view that the managerial team in solving its current problems gains new knowledge and insight from which it may define new opportunities to occupy its attention. Thus, the services of the team are simultaneously managerial and entrepreneurial, both concepts are needed to understand the development of the firm and the productive services that are derived from the bundles of resources under the control of the firm.

7. THE EVOLUTIONARY CONNECTION

We have given several hints already that the entrepreneur is essential to the process of economic evolution. In concluding, I want to amplify this theme as a way of drawing some of the threads together. Schumpeter has the distinction not only of placing the entrepreneur at the center of the process of economic development but of providing a clear articulation of the link between innovation and economic evolution. Innovations are new ways of using and defining resources, they add to the economic variety in the system and the response of the system is the competitive process of growth, decline and structural change. If innovation is variation then competition is selection and both are essential to economic change (Nelson and Winter, 1984; Cohen and Malerba, 2000; Metcalfe, 1998). An entrepreneur does not compete by replicating what rivals do but by being different and having the market assign positive profit to those differences. This is the essential dynamic of economic evolution, it is the economic variety in the system that governs the pace and direction of change. Since the process generates further changes in economic opportunity; we find a place for the Kirznerian idea of the entrepreneur as the agent of the market process, ever alert to new opportunities created by the wider evolution of the system. However, left to itself competition destroys economic variety both absolutely, some activities disappear, and relatively, as some come to dominate their rivals in economic importance. Without some process to regenerate

this variety, economic progress would come to an abrupt end. Here we find the importance of the idea of capitalism as an experimental system, a system that has established instituted frameworks of open market and scientific and technological search to regenerate economic variety (Nelson and Winter, 1984). These instituted frameworks define the nature of modern capitalism as a naturally competitive, knowledge-based system and give substance to the idea that economic change is endogenous, that market economies are strongly ordered but never in equilibrium. From this follows our conclusion about the nature of the entrepreneur, as the agent ultimately responsible for changing economic knowledge. In this capacity, the entrepreneur is both destructive, decorrelating existing knowledge, and constructive, bringing new patterns of resource use into existence through the market process and so correlating new knowledge. Knowledge of science and technology is important for the modern entrepreneur but not in itself sufficient, it must be combined with knowledge of market and organization, and it is this, which makes entrepreneurial insight so valuable.

Undoubtedly the wider conditions which influence the extension of entrepreneurship are of great importance, whether in terms of taxation, access to risk capital, regulations to permit the creation of new businesses and so forth and they define an agenda for entrepreneurial policy. This is the focus of Baumol (1993) when he suggests that policy can influence the payoffs to different kinds of entrepreneurship. However, this may not take us far enough if the question of entrepreneurial opportunity is not addressed. We have suggested that the core of the problem is necessarily defined in relation to the conditions surrounding the creation of new economic knowledge and, while one cannot legislate for creativity, let alone teach it, one can encourage open communication of ideas and the formation of distributed networks of collaborators in the innovation process. This is the great insight contained in the innovation systems literature that innovation and entrepreneurship are subject to the division of labour, and that this division of labour does not occur naturally but must be created to solve entrepreneurial problems (Edquist et al., 2003).

What is our conclusion? Any approach to the study of the economy which is framed in terms of equilibrium will miss the essential point about modern capitalism that it is strongly ordered but restless. As a system it can never be in equilibrium because knowledge can never be in equilibrium. It is because capitalism is intrinsically restless that the standard of living and the very nature of economic and social life now change so rapidly and so unevenly across the globe with consequences that are good and bad. Restless capitalism is necessarily uncomfortable capitalism. To understand its restless nature we need to place the notion of entrepreneurship at the heart of the analysis for the entrepreneur is the crucial agent whose role it is to generate new economic knowledge and thus transform the structure of economic activity. In so doing, new opportunities for entrepreneurial action are created from within the economy. Consequently, the most important aspect of modern capitalism is that just as knowledge creates further knowledge so entrepreneurship creates further entrepreneurship through the institutions of the market economy. That is why economic evolution is necessarily endogenous and could not be otherwise, and why market, firm, competitive process and entrepreneur are indissolubly linked.

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THE SOCIAL AND INSTITUTIONAL CONTEXT OF ENTREPRENEURSHIP

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1. INTRODUCTION

Entrepreneurship cannot be fully understood without making reference to the socio-cultural and politico-institutional context in which it arises and develops. The entrepreneur is an innovator who combines and transforms the factors of production (labor, land and capital, but also knowledge and social capital) in order to produce value-added goods and services to be sold in a more or less competitive market, within a given context. The degree of competitiveness of the *market depends on the number* of actual and potential competitors, on the relations with consumers and suppliers and on the availability of substitutable products. The degree of competitiveness of the entrepreneur depends on the quality-price ratio, which in turn depends on the way in which factors of production are employed. Both the structure of market opportunities and entrepreneurs' strategies are socially embedded. The socio-cultural and politico-institutional environment influences entrepreneurial attitudes and motives, the resources that can be mobilized, the constraints and opportunities related to starting and expanding a business, and the cultural climate that can either legitimize or hinder the entrepreneurial role. To put it differently, based on the theory of corporate social responsibility and stakeholder relations, (Freeman, 1984; Clarkson,1995; Chiesi, Martinelli, and Pellegatta, 2000), the context of entrepreneurship can be analyzed in terms of a plurality of stakeholders, i.e. all those groups and individuals whose cooperation is needed for a successful business performance and who have claims, rights and interests at stake with the firm's activities: shareholders and investors, employees, consumers/clients, suppliers, and the various political communities which provide the infrastructures, laws, non violent conflict regulation, and social legitimation.

In discussing the context of entrepreneurship I will start from Schumpeter's classical conceptualization in order to analyze the way in which the topic has been examined in economics and other social sciences. I will then review major contributions to the analysis in terms of social deviance and ethnic marginality, structural and cultural contextual variables, of situational constraints and opportunities, in the light of such concepts as double embeddedness, stakeholder and institutional mix. Finally, I will discuss ethnic entrepreneurship as a paradigmatic case.

2. SCHUMPETER AS A STARTING POINT

Schumpeter is the theorist of entrepreneurship 'par excellence'. We are indebted to him not only for the most cogent argument in favor of the key role of entrepreneurship in economic development, but also for paving the way for the analysis of the context of entrepreneurship.

Schumpeter (1926) defined the entrepreneurial function as innovation - the introduction of a new combination of factors of production that changes the conditions of supply, combines existing resources in new ways, and thereby sets up a new production function. He argued that entrepreneurship calls for a specific type of personality and conduct, which differs from the simple rational conduct of economic man. Entrepreneurial conduct is influenced by the cultural context of capitalism, but at the same time transcends it, insofar as it involves a mix of rational-utilitarian and emotional-non rational elements. On the one hand, it is rational in that it calls for a great measure of forecasting and planning. On the other hand, it is not utilitarian because it rests on an autonomous drive to conquer and struggle, to achieve and create for its own sake, and also rests on a dream to establish a family dynasty. The capitalist entrepreneur takes advantage of rationally based components of his social and cultural environment, such as money, science and individual freedom, and orients his conduct to rational values, but he is not the average product of capitalist culture. Entrepreneurial innovation is basically a creative act, deviating from the bourgeois culture which defines rationality from the narrower viewpoint of calculating to one's short-term advantage. The 'rationality' of the entrepreneur has an element of profit and gain, but is also based on the desire and capacity to fulfill a project, to think in a new and original way, and to act on those thoughts. In this respect the entrepreneur is different both from the routine manager and from the owner of financial capital. In his analysis of the cultural background, which fosters entrepreneurial conduct and motivations, Schumpeter deviates from the assumptions of both classical and neo-classical economists and the thought of scholars like Weber, Pareto, Sombart and Tonnies, all of whom, in different ways, tended to equate utilitarian rationality with capitalism.

Schumpeter (1927, 1942) contributed to the study of the context of entrepreneurship not only through the analysis of the cultural roots of entrepreneurial conduct, but also through the investigation of the relationship between the entrepreneurial function and the bourgeois class, which is closely related to the question of whether entrepreneurship is a universal or a historically contingent phenomenon. Schumpeter argues that entrepreneurship, as a specific historical phenomenon, is an expression of the general phenomenon of leadership and rests on the premise differentiating a distinct economic sphere from other spheres - a premise which is at the core of classical sociological studies of modern society. In previous epochs, the entrepreneurial function was fused with others in the actions of religious, political and social leaders. In any historical society there is leadership, defined as the capacity to conceive and lead the making of innovations. What changes in the different historical contexts is the privileged sphere where leadership is applied, which is related to the core function for the survival and development of that given society. Entrepreneurship is the specific historical form that leadership assumes in capitalism. Given the importance of innovation and competition in that kind of economy, the entrepreneur is a particularly distinctive (and even an essential) feature of capitalist development.

Schumpeter's conceptualization of the context of entrepreneurship is better understood

in the light of his analysis of social classes. He developed a unique view of social stratification and of the relationship between entrepreneurship and social classes. For him, the class structure is the hierarchical order of families. Individuals belong to classes independently of their own will. The basic factor explaining the mobility of families within classes is the same one that explains mobility from one class to another: the capacity to adapt to the needs set by the social environment of a historical epoch and to demonstrate those socially recognized abilities necessary for a leadership role. Social classes change slowly over time, like hotels or buses, as they are occupied by different populations. The performance of socially important functions is the core element of classes, because it generates social prestige and consolidates society into ranks. Once established, the social prestige system tends to acquire a life of its own - the life of social rewards, gratifications, influence, and deference - and often survives long after the functional base has eroded. The status of the upper classes in society, and of the leading families in those classes, is consolidated through solidarity ties among their members and the transmission of social privileges from one generation to another. In capitalist society, the bourgeoisie is the leading class, because bourgeois families have performed the innovating and leadership role in the economy and because they acquire, consolidate and transfer prestige, power and wealth to future generations.

3. THE STUDY OF THE CONTEXT OF ENTREPRENEURSHIP IN ECONOMICS AND IN OTHER SOCIAL SCIENCES

Schumpeter - together with a few other scholars like Kirzner - was a notable exception in the economics of entrepreneurship. For most economists the question of entrepreneurship is not problematic. Entrepreneurship is just a variable dependent upon economic factors, such as availability of capital, labor, and raw materials, advanced technology, factor mobility, and access to markets. Most economists seem to think that entrepreneurial activities will emerge more or less spontaneously, whenever economic conditions are favorable, as an instance of rational profit maximization. In spite of its assumptions of methodological individualism, mainstream economics stresses external, systemic variables much more unilaterally. Economic actors are assumed to behave in a fixed, rational maximizing way, to respond systematically and without friction to external market conditions, leaving no room for true novelty.

Context is either ignored or taken into account disregarding its social and cultural complexity and the variety of different historical settings. Besides, there is no appreciation of the interaction between actor and context, since there is no theory of the actor, either individual or collective, of his motives, values, attitudes, cognitive processes, or perceived interests.

An instance of this approach to entrepreneurship is provided by development economists of the post-World War II period who share the idea that pure entrepreneurial profit is the easily achievable reward made possible by market conditions. This approach is based upon a set of implicit assumptions about the changes that occur in underdeveloped economies, once appropriate incentives are introduced: that factors of production are relatively mobile; that producers, consumers, and resource owners have knowledge of all the opportunities open to them; that risk and uncertainty are minimal; and, most important for our topic, that the influence of social institutions is neutral. The policy implications of this approach for

a development strategy are as follows: if you let the market work and remove the barriers of traditional society, entrepreneurs will appear from everywhere. When the above assumptions are relaxed, and market segmentation, ignorance, impeded factor mobility, and pervasive administrative controls appear, the 'extraordinary' role of the entrepreneur becomes apparent, as does the need to analyze more carefully the factors that can favor his formation. Economic development requires much more than appropriate market conditions and entrepreneurship cannot be seen as an inevitable, spontaneous response to those conditions; rather, the interplay between entrepreneurship and its context is a key factor in understanding the development process.

This view, common in other social sciences, is shared only by a few economists, such as Kirzner who, under the influence of Schumpeter, Von Mises and Hayek, criticizes mainstream economics for its fundamental notion of individual choice as a matter of 'maximizing behavior' (1973, 1989). Human action is partly guided by maximizing criteria, but alertness, creativity and judgment, i.e. the characteristic features of the entrepreneur, also influence what we do. Entrepreneurship is favored by an appropriate system of not only economic but also social incentives, i.e. not only profit, but also fame, prestige, and power. Entrepreneurial competition is a discovery procedure of profit opportunities, and the competitive system is dependent on the free interplay of individuals, i.e. a fundamentally social one.

This view of entrepreneurship — which is exceptional in economic theory — is the rule in other social sciences. Most sociologists, social-psychologists, business historians and anthropologists tend to see entrepreneurship as a much more problematic phenomenon, deeply embedded in societies and cultures; they focus on the influence of, and the mutual interplay among, non-economic factors - such as cultural norms and beliefs, class relations and collective action, state intervention and control, organizational structures, bounded solidarity and trust, deviant behavior and marginality status, and motivations for achievement.

They also look at the interplay between actor and context. Metaphorically, we can say that, for entrepreneurship to emerge, it is necessary for the 'seed' to find the appropriate 'ground'. Certain scholars focus on the seed, i.e. either on specific psychological traits of entrepreneurial personalities or on their social characteristics. Other scholars focus on the breeding ground, which is analyzed either in its structural factors (e.g. types of markets, factors of production, class and ethnic relations, state planning, etc.) or cultural factors (business ethics, social approval of economic activity, etc.). On the one hand, there are studies that focus on action rather than on context, emphasize personal traits and motivations for achievement and consider macro-sociological variables, such as status withdrawal of marginal groups - only insofar as they influence family socialization to specific personality traits. On the other hand, there are approaches that focus on systemic variables, both structural and cultural, and situationist models, which emphasize context rather than action.

There are significant differences between oversimplified models which neglect the autonomy of human agency and more sophisticated models which see a more dialectical relation between actor and context and/or between actor and situation. In this paper I will discuss the latter type of approach, focusing on the context of entrepreneurship through the notion of double (or mixed) embeddedness (Kloosterman et al., 1999, Martinelli, 2002b).

4. DOUBLE EMBEDDEDNESS

The concept of double embeddedness highlights the two major ways in which the context of entrepreneurship can be analyzed: first, as the politico-institutional environment of market capitalism, including types of markets (of factors of production and of goods and services), and types of laws (fiscal, labor, anti-trust, etc.) and institutions of governance; second, as the social and cultural background of entrepreneurs, including cultural attitudes favoring technological innovation and risk taking (e.g. the deviant entrepreneur) or networks of social relations and social capital. I will discuss the first type of questions with reference to the contributions of Fligstein, Hollingsworth, and Boyer, and to my own work on institutional coordinating mixes and on the firm's stakeholders. I will also examine the structural and cultural factors favoring or hindering entrepreneurial action with reference to a variety of authors, from Hoselitz and Young to Waldinger and Rath, from Berger to Portes, from Glade to Gibb and Ritchie.

The study of the institutional context of entrepreneurship is a long standing tradition of research, ranging from the Harvard Center for Entrepreneurial History to recent studies on the varieties of capitalism and the embeddedness of institutions.

Successful entrepreneurs — those who exploit a technological breakthrough or enter a new market for raw material, goods or services and in so doing gain a competitive advantage — do not operate in a social vacuum. They have to persuade investors, obtain raw materials, build an organization, and motivate workers. They also have to devise ways to stabilize relations with their competitors and abide to the rules and laws set by governments. The dynamism of entrepreneurial capitalism is made possible by a complex set of social relations among firms, with their stakeholders and with governments. The intrinsic drive of entrepreneurial capitalism must be tamed by stable societal institutions, laws and state policies.

Entrepreneurship is defined by technological innovation in a competitive market. But both technology and competition require an extensive social organization. Innovation is entirely different from invention: the introduction of a new technology is often led by the perception that the solution to a specific problem would yield profit, but also by the intuition that the necessary supporting structures for the creation of a new market will be available.

Similarly, competition produces social-organizational responses. Much of the history of the largest corporations can be interpreted as attempts to stabilize markets and to find non-predatory ways to compete (Fligstein, 2001). Successful entrepreneurs are those who succeed in establishing stable relationships with their internal and external contexts, their workers, suppliers, customers, and main competitors. The ability to establish these relationships is itself dependent on the production of stable societal institutions such as governments and laws.

Contrary to the view that firms are efficient wealth producers, while governments are intrusive and inefficient, we argue that, in order to last and develop, entrepreneurial activities require the establishment of a stable and reliable legal and political environment. Government legislation and policies are necessary in the form of patents, antimonopolistic laws, consumer protection laws, public spending to sustain aggregate demand, support for exporting firms, etc. Entrepreneurship flourishes in a regulated context, where the confidence of customers, investors and employees is not shaken by predatory behavior and illegal action.

Business misbehavior, like that exemplified in the Enron and Worldcom cases, has a greater damaging effect than terrorist attacks, because it shakes investors' confidence and citizens' trust in the fairness of the market mechanism.

5. INSTITUTIONAL MIX AND STAKEHOLDERS

There is not one single appropriate institutional environment for entrepreneurial development.

Different varieties of capitalism exist and evolve through time, as well as different modes of corporate control. Fligstein (1990) has shown different forms of corporate control in American business history in the XX century — from vertical integration to financial control — and how governments and laws, alongside competitive strategies, impinge on them. But the institutional context of entrepreneurship is not limited to the interplay between markets, firms and governments. Studies on the institutional variety of capitalisms have shown how more complex institutional mixes of markets, states, hierarchical organizations, communities, clans, networks, and associations coordinate and regulate business activities (Williamson, 1975, Streeck and Schmitter 1985, Chiesi and Martinelli, 1989, Hollinsgworth and Boyer, 1997). Each of these coordinating mechanisms has its own logic - its own organizational structure, rules of exchange, procedures for enforcing compliance both individually and collectively – and can be evaluated in terms of efficiency, effectiveness in delivering private and collective goods, and capability to meet the claims and expectations of various stakeholders of the firm.

The approach focusing on the various forms of capitalism and the institutional mix of coordinating mechanisms can be usefully integrated with the stakeholders' approach. In both approaches what really matters is the emphasis on the complex environment of entrepreneurial action which has to consider interests, claims and values of a variety of individuals, groups and institutions. Stakeholders are persons or groups that have, or claim, ownership, rights, or interests in a corporation and its activities — past, present, or future. In a narrow sense, stakeholders are all those identifiable groups or individuals on whom the organization depends for its survival: stockholders, employees, customers, suppliers, and key government agencies. In a broader sense, a stakeholder is any identifiable group or individual who can affect and/or is affected by organizational performance in terms of products, policies and work processes. In this case, public interests groups, protest groups, local communities, government agencies, trade associations, competitors, unions, and the press are organizational stakeholders. We can also distinguish between primary and secondary stakeholder groups.

Primary stakeholders are those without whose continuing participation the corporation cannot survive as a going concern - typically shareholders, investors, employees, customers and suppliers as well as what is defined as the public stakeholder group, i.e. governments and communities that provide infrastructure, markets, laws and regulations. Secondary stakeholder groups influence or affect the corporation but are not engaged in transactions with the corporation and are not essential for its survival (Clarkson, 1995). A key component of the entrepreneurial role is stakeholder management, i.e. the capability to deal with the web of interrelations of entrepreneurial action. The identification of relevant stakeholders and of their relative importance is in turn influenced by the general institutional context.

The priority given to different types of stakeholders in business life helps distinguish between two major models of contemporary capitalism: the continental European and the

Anglo-Saxon models (Martinelli, 2002a). The former can also be defined as the social market economy model. According to it, the goal of market competitiveness is pursued together with social cohesion through different types of welfare policies and various forms of concertation and codetermination (Mit-Bestimmung). Unions are key actors in the political system and workers, together with stockholders, are the most important stakeholders of the firm. In the political culture of these countries several basic rights — first of all the social rights to employment, work safety, health care and pensions — have been recognized to citizens qua workers. In the Anglo-Saxon model, which can be also defined as the market-driven model of capitalism, the primary concern is for the rules of the competitive game. Anti-trust laws, Security Exchange Commission regulations of insider trading, consumer protection laws are all instances of an institutional context in which citizens are perceived first of all as entrepreneurs, investors, consumers, rather than as workers.

As Boyer, W. Coleman, Hollingsworth, and Sabel convincingly argue (Hollingsworth and Boyer, 1997), there is no single best mix of institutional coordinating mechanisms.

No single institutional arrangement can claim universal validity, since a more complex mix of context-specific and continuously evolving institutional arrangements coordinate economic activity, combining individual self-interest with social obligation, and power with cooperation.

This richness of institutional context has not diminished because of globalization.

Contrary to a widespread belief, globalization does not induce homogenization towards a single model but stimulates a variety of institutional responses, which are rooted in the specific cultural codes and social relations of different countries and regions. In order to give account of the importance of the context, Hollingsworth and Boyer (1997) have introduced the concept of nestedness. Nestedness refers to the complex intertwining of institutions at all levels of the world. It derives from globalization and imposes a different combination of economic institutions at various spatial levels, since the embeddedness of economic institutions at the level of the nation-state has been progressively eroded both from above (supranationalization) and from below (regionalization). Nestedness implies that the evolution of capitalist institutions will produce a series of governance modes at various levels of society and that economic policy and institutional change will be more difficult, since no supranational central authority is able to monitor effectively a series of innovations. I have addressed the same type of problem in a broader perspective, discussing how global governance, which cannot be limited to the governance of the global market, can best be conceived as multilayered governance, to be achieved through complex patterns of institutional interdependence (Martinelli, 2003).

To conclude, these types of studies focusing on the institutional context of entrepreneurship challenge two central assumptions in neo-classical economics: the assumption of a general theory about how people allocate scarce resources to different ends, which is applicable to all societies at all times, and the assumption of perfectly competitive markets which are based on profit maximization and perfect information. These studies maintain, on the contrary, that social relations and societal institutions are not exogenous to market capitalism, but endogenous elements as much as innovation and competition; and that, since they have evolved through time as solutions to specific market crises, economic depressions and social and political conflicts, they change over time and from place to place.

6. SOCIAL DEVIANCE AND ETHNIC MARGINALITY

Let's discuss now the other side of the double embeddedness of entrepreneurship, that is the social and cultural background of entrepreneurs. The question of what contextual conditions produce entrepreneurs has been traditionally addressed by some sociologists in terms of deviance and marginality. As I argued above, Schumpeter's entrepreneur is, at least to some extent, a deviant, one who develops non-rational attitudes in a rational environment. In Der Moderne Kapitalismus (1916-27), Sombart remarks that creativity and the ability to break from traditional values and patterns, which characterize the capitalist entrepreneur, can be found in all peoples, social groups and religions, but that they are more frequent among members of certain minorities, such as heretics, foreigners, and mainly Jews. These groups are not completely accepted in the societies they live in; and therefore they can avoid more easily than others the traditional values and norms that regulated economic behavior in pre-modern Europe. Because of their minority status they are both tolerated and oppressed; they tend to develop specific skills in commercial and financial activities which they are allowed to practice; and, because of their acute sense of diversity, they maintain a high degree of group solidarity which favors trust and therefore credit among the members of the group.

The insights of both Sombart and Schumpeter were developed a few decades later by modernization theorists such as Hoselitz and Young. Hoselitz (1963) argued that entrepreneurs are deviant because of their marginal status. Acting in a hostile social milieu, where prevailing attitudes are against innovation, and being excluded from political power, they concentrate on business; but, being outside the dominant value system, they are subjected to lesser sanctions for their deviant behavior. Thus, because of their ambiguous position from a cultural or social standpoint, marginal groups - such as Jews and Greeks in medieval Europe, Lebanese in West Africa, Chinese in Southeast Asia, and Indians in East Africa — are particularly able to make creative adjustments in situations of change and, in the course of this adjustment process, develop genuine innovations in social behavior.

In a similar vein, Young (1971) identified as the key variable the degree of organic solidarity (in Durkheim's sense) which characterizes the interactions within the group. What is relevant, according to Young, is not being deviant with regards to the larger society, but having institutional resources as a source of competitive advantage. Thus members of the group can overcome lack of social recognition and denied access to important social networks.

More recent works on ethnic communities (Ward and Jenkins 1984; Waldinger, Aldrich, Ward, et al., 1990; Light and Rosenstein, 1995; Rath, 2000), which I will discuss later, and women (Goffee and Scase, 1985) follow a similar 'positional' approach. Structural factors within the larger society, such as racism, sexism and credentialism, turn people into 'outsiders' through processes of exclusionary closure. Such 'outsiders' often form 'feeder groups' from which new entrepreneurs emerge.

7. THE STRUCTURAL CONTEXT OF ENTREPRENEURSHIP

The social marginality approach has been challenged on two grounds: on a structural ground, by those who argue that dominant classes in society can produce entrepreneurs more than marginal groups, because of their access to economic, political and social resources; and on

a cultural ground, by those who argue for the importance of core (hegemonic) societal values and see social approval as a requisite of entrepreneurship. Among the former, I will focus on the class analysis interpretation of entrepreneurial formation; among the latter, I will discuss the so-called 'neo-Weberian' approach and 'social legitimacy or social attitudes' models.

Empirical evidence for the social marginality approach mostly comes from two sources. First, from European countries before the industrial revolution, where hegemonic culture did not favor economic activity and marginal groups, such as Jews, heretics and foreigners, could more easily be accepted into such roles. Second, from advanced industrial or newly industrialized societies with large immigration groups and high rates of social mobility (such as the United States and the Pacific Rim countries). However, in developed countries (both early industrialized countries such as Great Britain and France, and 'latecomers' such as Germany, Italy and Japan), where more consolidated class structures existed, a high percentage of new entrepreneurs came from the already 'privileged' and mainstream pre-industrial status groups, such as merchants, land-owners and wealthy artisans, who possessed material and intellectual resources for economic achievement.

Classical studies of capitalist development, both in the Marxist and in the non Marxist traditions, stressing social relations of production, state policies, and political and social conflict, show the importance of mainstream rather than marginal classes and status groups.

Marx's account of primitive capital accumulation (1867), Pirenne's analysis of the role of merchants in the formation of urban bourgeoisie (1914), Brentano's view of the acquisitive aristocracy as a proto-capitalist class (1916), Dobb's thesis of the revolutionary role played by yeomen and independent artisans (1946) are all instances of the importance of social groups which occupied well established positions in the 'traditional' societies and played a central modernizing role. Although in different ways, studies of modernization and world capitalist development by Barrington Moore (1966), Bendy (1978), Wallerstein (1979) and others show the importance of well-entrenched social classes in entrepreneurial formation and consolidation.

Even in a much more open society as the United States, the contribution of immigrants and lower classes to the formation of entrepreneurship has been greatly exaggerated and can be seen as an instance of the myth of the self-made man. Business historians at the Harvard Center for Entrepreneurial History, such as Miller and Neu and Gregory (1952) and sociologists, such as Mills (1956), found a rather stable recruitment pattern: most of the business elite in the period of the great American industrialization (1870-1910) came from land-owners or entrepreneurial families, whereas lower classes contributed between 10% and 20%. A similar critique of the popular origins of entrepreneurs in industrialized countries comes from major studies in social mobility (Lipset and Bendix, 1959).

The social marginality approach is better understood if applied to historical situations where the dominant culture does not encourage entrepreneurial activity, whereas marginal groups can more easily be accepted in such roles. In modern capitalist societies, on the contrary, where rational-utilitarian and individual achievement values are widely accepted, it is much more likely for entrepreneurs to come from central or even dominant groups in society.

Research on many contemporary Western societies (Bottomore and Brym, 1989; Martinelli et al., 1981) also shows the importance of middle and upper classes in the formation of

entrepreneurship. Key variables are the mechanisms and institutions of social reproduction of the business class, such as schools, marriage patterns and social networks. Significant differences exist among economic sectors: the percentage of new entrepreneurs who were former managers or professionals is generally higher in technologically advanced sectors such as computers, Pharmaceuticals and fine chemicals and in several branches of the service economy. Here professional skills and educational credentials constitute a fundamental resource for entrepreneurial success and we witness many instances of management buy-outs of firms.

8. THE CULTURAL CONTEXT OF ENTREPRENEURSHIP

Weber's comparative analysis of religious ethics and economic action in the origin of capitalism provides the basis for studies stressing cultural context variables (1922). Neo-Weberian research focuses on the degree to which the forces of rationalization - responsible for dislodging individuals from their embeddedness in nature, religion, and tradition - continue to shape economic growth and social modernization. Following Weber and Parsons (and in a similar vein to Berman's perceptive study of modernity, 1982), scholars such as Kellner (1973), Brigitte Berger (1991), and others have focused on the typical cognitive style that distinguishes modern consciousness: for example, instrumental rationality and a pronounced propensity to combine and recombine various elements of activities for the achievement of rationally calculated ends. This cultural approach to entrepreneurship argues that economic growth develops 'from the bottom up', rather than 'from the top down'. Ordinary individuals compete with each other in order to achieve a variety of goals, including economic profit and self advancement, in their everyday activities, practices, habits and ideas, thus creating the basis for other distinctly modern institutions to emerge. These may mediate between the individuals and distant, large-scale structures of society.

Evidence for this approach is found in empirical research, including: Redding's analysis of the relation between basic aspects of Chinese culture, such as Confucian ethics and family attitudes, and the entrepreneurial behavior among overseas Chinese (1990); Martin's analysis of the role of Protestant sects in generating a dynamic process among segments of the urban poor in contemporary Latin American cities and fostering entrepreneurial activities (1990); and Landa's thesis of entrepreneurial success of ethnically homogeneous middlemen groups in Africa and in Southeast Asia (Berger, 1991).

Students of migrations, such as Portes (1995), have accused cultural interpretations of having little predictive power, since they are invoked only after a particular group has demonstrated its economic prowess. They have also been accused of being ultimately tautological, since if a certain minority is successful, it must be because it originally had or later acquired the right values. To this critique I add two others. First, these studies make no clear distinction between hegemonic culture and marginal group sub-cultures: sometimes the contrast with core cultural values is presented as a cause of entrepreneurial success; some other times the convergence with the core value of instrumental rationality is considered to be the cause. Second, the concept of culture is often stretched so far as to include social interaction in general and all sorts of social networks, without paying attention to structural

variables which fundamentally affect social interaction, such as patterns of solidarity, class, status, power relations, legal norms, and state arrangements and policies. Yet, although too unilateral, this approach can contribute to explaining why ethnic minorities with a similar marginal status show different levels of economic performance.

The cultural paradigm that is the clearest alternative to the social marginality approach is the social attitudes (or cultural legitimation) model, developed by members of the Harvard Center for Entrepreneurial History, such as Landes (1949) and Sawyer (1951), and by sociologists such as Lipset (1967). Comparing the United States and Latin America, Lipset explains differences in economic development focus in terms of the degree of legitimation of entrepreneurship, cultural norms, role expectations and social sanctions, which can either favor or hinder innovation.

Comparing France and the United States, both Landes and Sawyer maintain that the delay with which France completed the process of industrialization and the different degree of economic development of the two countries were due to their different historical heritage.

While in France the feudal heritage had left a consistent residual of social attitudes hostile to entrepreneurship, which limited the recruitment of entrepreneurs, in the United States, the absence of a feudal past allowed the growth of a socio-cultural context which was especially receptive to innovation and entrepreneurship. Gerschenkron (1962) refutes Landes' and Sawyer's theses, without siding with the social marginality approach either. He argues that the mistake of giving too much importance to social attitudes lies in assuming the existence of a homogeneous and generalized value system in society. As counterevidence, Gerschenkron brings in the cases of XVIII century fermiers généraux in France and of XIX century emancipated serfs in Russia, who became entrepreneurs in spite of an unfavorable cultural environment. Gerschenkron's critique is couched in his theory of different paths to economic development; according to him, different countries develop through a different mix of what he calls the 'institutional agents' of development, such as private entrepreneurs, merchant banks, and governments.

9. THE SITUATIONAL APPROACH

The relation between structural context and entrepreneurial action is also at the core of the 'situational approach'. Glade (1967) opened the ground to the 'situational approach'. Instead of looking, at the macro level, at the institutional conditions for entrepreneurship, Glade asks himself what an entrepreneur actually does. He calls for a situational analysis of entrepreneurship at the micro level, in terms of changing opportunity structures. According to him, actors make choices and decisions within social settings, which are opportunity structures changing over time. Entrepreneurs are individuals who can recognize new opportunities and take advantage of them, without losing out to others. As Glade puts it, "What emerges as integral features of any given situation are both an 'objective' structure of economic opportunity and a structure of differential advantage in the capacity of the system's participants to perceive and act upon such opportunities".

Glade's approach has been elaborated by Greenfield and Strickon (1981). They propose using Darwinian biology as a metaphor for the study of change. As Darwin rejected typological,

essentialist biology, they reject fixed types of entrepreneurship - the analogue of the immutable species - and recognize existing diversity of behavior within specific human populations (or communities), which at its extremes encompasses innovation and novelty. These diverse behaviors interact with their environments, to produce outcomes which are evaluated both by the actor and by others. Innovations that are judged to be more advantageous in terms of the standard prevailing within the group may be selected, 'learned' and imitated, the result being the establishment of a statistical pattern. Society, culture, religion, politics, and economics are not seen as entities with a reality of their own but as statistical patterns abstracted from the variable behaviors of the members of specific communities.

Gibb and Ritchie (1982) integrated the concept of reference group into the situational approach In their 'social development model' entrepreneurship is interpreted in terms of the situations which individuals encounter and the social groups to which they relate. Individuals change continuously and their interactions with specific social contexts and reference groups produce distinctive ambitions and behavior. The wide range of influence and interactions make it impossible to define a single entrepreneurial model, yet there are typologies. The typology they suggest distinguishes among four types of entrepreneurs. 'improvisers', 'revisionists', 'supercederes', and 'reverters', each of whom is at the center of different sets of influences.

The most convincing contributions to the study of the context of entrepreneurship are those integrating various approaches and selecting the most appropriate mix for analyzing specific empirical questions and historical realities. In order to prove this point I will discuss ethnic entrepreneurship as a paradigmatic case with reference to such diverse works as Aldrich's and Waldinger's study of ethnic entrepreneurship (1990), Kloosterman's mixed embeddedness approach (1999), Engelen's analysis of markets (2001), and my own contribution (2002b). All of these studies produce models which try to combine a plurality of variables in order to understand the relation between the entrepreneur and the context he is embedded in: social networks, selective migration trends, settlement patterns, structure of markets, access to ownership, residential patterns, group culture and aspiration levels, and immigration and labor market policies.

10. ETHNIC ENTREPRENEURSHIP AS A PARADIGMATIC CASE

I will conclude by discussing ethnic and immigrant entrepreneurship as a paradigmatic case, insofar as it shows the effectiveness of a multidisciplinary approach to the study of the context of entrepreneurship. Aldrich and Waldinger (1990) provide a good example focusing on such diverse variables as structure of markets, access to ownership, state policies, group characteristics, predisposing factors, and resource mobilization. As for types of economic environments that might support new immigrant entrepreneurs, they identify core urban markets that are increasingly abandoned by large food retailers, markets where economies of scale are low, markets affected by instability or uncertainty, and markets for exotic goods.

As for access to ownership, the relevant conditions are the level of interethnic competition for jobs and businesses, patterns of residential segregation and succession, and state immigration and labor market policies. As for group characteristics, predisposing factors

and resource mobilization, they focus on selective migration trends, settlement patterns, culture and aspiration levels, ethnic social networks, and organizing capacities. Although Aldrich and Waldinger's preference is for structural and institutional variables (such as market niches and group resource mobilization) over cultural variables (such as group cultural heritage), they take into account all co-variables that can reasonably affect entrepreneurial formation in ethnic communities.

In a similar vein, Kloostermann, van der Leun and Rath (1999) adopt the concept of mixed embeddedness in order to compare various forms of immigrant entrepreneurship in different national and urban contexts. They study ethnic entrepreneurship both from the supply side -with regards to the rather concrete embeddedness in social networks and cultural specificities of immigrants - and from the demand side - with regards to the more abstract embeddedness in the socio-economic (considering not only the dynamics of available markets, but also the nature of social relations) and politico-institutional environment of the country of settlement. In other words, the ethnic group's social and cultural features are related to the opportunity structure available, in which ethnic entrepreneurs have to find possibilities to start a business and subsequently maintain or expand that business.

The key questions in the study of ethnic and immigrant entrepreneurship are: what human, financial and social capital resources do these individuals have to negotiate with their environment? And what specific opportunities and handicaps are at work for them? In other words, what specific advantages and disadvantages do non indigenous entrepreneurs have in dealing with their stakeholders? More specifically.

a) in acquiring the investment capital needed to start and develop their business;

b) in recruiting, managing and rewarding labor and in introducing process innovations;

c) in dealing with competitors and in adapting/influencing the structure of relevant markets;

d) in dealing with the consumers-clients and in introducing product innovations;

e) in adapting to/taking advantage of the types of state migration policies and laws which can either help or hinder their activities.

An example of this approach is Godsell's study (Berger, 1991) of how South African Indians, embedded in organic networks and communities, have been remarkably successful in circumventing the massive legal and political constraints of apartheid. Another instance of this approach is Portes's and Min Zhou's study (1992) of Dominican immigrants and other domestic minorities in the United States. They focus on minorities who 'made it' in the American economy neither through self reliance, complete assimilation of the right kind of values and acquisition of marketable educational skills, nor through massive governmental assistance. In the study they look for the relevant causal processes in the social structure of the ethnic community, with its networks, normative structure, and supporting or constraining effects on individual economic action.

Sociological research on ethnic entrepreneurship shows how bounded solidarity and enforceable trust are important for entrepreneurial success as sources of social capital (Coleman, 1989). They are contrasted to the corresponding values of the cultural approach and to the economic opportunities and cultural credentials of the economic approach. Bounded solidarity is created among immigrant customers, workers and investors because they are treated as foreigners and they have heightened awareness of the symbols of common nationhood. Bounded solidarity is accompanied by the existence of enforceable trust against malfeasance among prospective ethnic entrepreneurs. Trust is based on the ostracism of violators, who are cut off from sources of credit and opportunity in the ethnic economy, rather than on generalized cultural loyalty. This is shown in the flexible transactions among Jewish diamond merchants in New York and in the smooth operation of rotating credit among Asian immigrant communities. Bounded solidarity and enforceable trust, as sources of social capital, do not stem from shared value orientations, but from the position of ethnic minorities in the wider social structure. Citizens of China, Korea or Cuba do not display any exceptional bienfeasance and solidarity in economic transactions when they are in their native countries. Such benefits stem from being members of an identifiable social minority in the host country. The social capital represented by social networks within the ethnic community is important in acquiring human and financial resources necessary for entrepreneurial activity and in creating specialized 'protected' markets for ethnic goods and services (Ma Mung, 1992).

Social networks and cultural specificities favor the low-cost procurement of essential means of production and the formation of protected outlets for their products. As far as investments are concerned, the key variable is the social cohesion of family groups and of ethnic communities. Networks of mutual aid - which play a major role in favoring the integration of newcomers - are also relevant in providing financial aid. Immigrants' institutions, such as religious centers, community schools, ethnic associations, often help in collecting money and providing risk capital. Pioneering firms frequently become incubators of other connected firms, managed by relatives and friends to whom they provide orders and financing.

Ethnic and family networks are also important in recruiting and managing workers. The labor market is generally a demand market, where suppliers of labor lack bargaining power because of the number and irregular status of most immigrants. Besides, immigrant entrepreneurs are interested in attracting workers from their own ethnic and extended family background because they are more reliable. Small, labor-intensive, family firms often base their competitiveness on lower wages, longer working hours, and greater availability for their clients. This is typically the case of all those small ethnic businesses which offer a variety of house maintenance, surveillance and domestic services (house-cleaners, restaurants, take-aways, launderettes, etc.), which are no longer provided by the female population which is increasingly integrated in the labor market of the global cities (Sassen, 1991). In this kind of jobs some of the most negative features of ethnic firms are more evident, such as low wages, lack of legal protection and labor rights, forms of work segregation and exploitation, child labor, and the encouragement of illegal immigration.

The social capital made up of networks of ethnic relations is also relevant in dealing with consumers-clients and in introducing product innovations through the formation of ethnic markets and the supply of ethnic products. Ethnic markets are at the core of various typologies,

such as those that can be drawn from the works of Ma Mung (1992) and Ambrosini (Zincone, 2001). These usually distinguish among:

a) specifically ethnic firms that meet the particular needs of a spatially concentrated and integrated immigrant community, providing goods and services that are not available on the regular market, as in the case of ritual Islamic butcher shops.

b) 'middlemen' firms offering products and more specifically services that are not typically ethnic, but need to be mediated and 'translated' through relations of trust with the potential clients, as in the cases of medical and legal services, financial and fiscal consulting, travel agencies, books and videos in native languages;

c) 'exotic' firms that offer goods and services of a specific cultural tradition - either imported or made in the country of immigration - to increasingly heterogeneous consumers, as in the typical cases of gastronomy and showbusiness.

These typologies focusing on product specialization and marketing strategies are usually static, but can be easily transformed into sequential phases outlining the growth strategies of immigrant entrepreneurs. On the basis of research made by Ward and Reeves (1984) in the British Midlands, Waldinger and his colleagues (1990) identify a four-phase sequence in the route of ethnic entrepreneurs:

a) the first phase is that of 'first entry markets', which are based on a high degree of ethnic and spatial concentration, on the one hand, and a low level of economic specialization, on the other;

b) the development of so-called 'ethnic niches' constitutes the second phase, in which the high level of spatial and ethnic concentration is coupled with a much more extended market so that economic specialization is further enhanced;

c) in the third phase these ethnic niches are transformed into the so-called 'middlemen markets' where middlemen minorities sell 'ethnic goods' to the population at large. This strategy leaves the ethnic nature of the goods intact, but implies a sharp break with the spatial logic of ethnic segregation. It is an entrepreneurial strategy in Schumpeter's sense, insofar as innovative marketing and distributing techniques find new markets that are spatially much larger than the entry markets of the first phase and groups of customers which are richer and culturally more heterogeneous;

d) the fourth and final phase is that of economic assimilation, where the very nature of ethnic products, productive process and marketing and distributing strategies are transformed according to a market-driven logic, in order to meet the tastes of the general public. A process of cultural hybridization takes place, in which ethnic entrepreneurs progressively lose their ethnic features and acquire those of mainstream firms. In a similar vein, Jones focuses on the breaking out strategies from narrow, segregated markets to general markets.

This type of sequence has been criticized by Engelen (2001) for three main reasons. First, it betrays an assimilationist ideology insofar as economic assimilation is presented as the goal of business success and social integration. Second, it neglects the fact that innovation tends to foster differences not similarities, i.e. businesses become as dissimilar as possible from their competitors. Third, spatially oriented strategies are more effective and better suited for some types of entrepreneurs (retailers) than for others (manufacturers or wholesalers).

Most studies of ethnic entrepreneurship focus on the relations with buyers (consumers/clients) as the key stakeholder. They tend to limit their analysis of the context to the social and cultural variables affecting potential outlet markets and growth strategies and, to a lesser extent, the low-cost procurement of essential means of production. At least equally important, however, should be studies focusing on competitors and on barriers to entry of various kinds: economic-financial barriers (money required), cultural barriers (prejudices and requisites of competence), and legal barriers (migration laws and regulations).

An interesting contribution in this latter perspective is that of Engelen (2001), who puts the process of competition at the core of reasoning. He adopts Harrison White's concept of market as a group of producers of substitutable goods and services, of a 'product space' where 'producers watch each other'. He stresses the role of information and insight into competitors' strategies as key elements of entrepreneurial activity and the role of social networks as a basic condition for adequately choosing one's own strategy. Engelen then applies Porter's analysis of the competitive process and of barriers or threats to entry to the study of ethnic entrepreneurship. According to this, the level of competitiveness is highest if economies of scale are absent, if product differentiation is minimal, if capital requirements are low, if switching costs are limited, if access to distribution channels is relatively open, and if government regulation is limited.

Porter argues that entrepreneurs use a mix of five different strategies in order to raise one or more of these barriers to limit threats to entry and profitability:

a) product strategies (carving out new market niches by creating new products and by introducing new product mixes and old products at new locations);

b) production process strategies (aiming at cutting production costs both directly - through labor saving investments, and indirectly - by turning jobs into complex and challenging tasks while keeping the organization as simple as possible);

c) marketing, sales and distribution strategies (gathering better information on consumers' preferences, through 'buy now and pay later' schemes, introducing e-commerce, etc.);

d) integration and cooperation strategies (which have to do with firms' ability to redraw their boundaries).

On the basis of this conceptual framework a set of hypotheses can be formulated about the most viable competitive strategies and strategy mixes that ethnic and migrant entrepreneurs can adopt in order to improve their position in a given market space. The barriers to entry vary very much from one country to another, from one economic sector to another, and with

regards to the problem of either entering a market or consolidating one's own business.

Differences among countries are mostly evident with regards to public policies and laws (not only specific immigration policies, but also more general fiscal, trade and labor policies and laws). Clear differences, for instance, exist between Anglo-Saxon and European countries. In Anglo-Saxon countries, a 'market-driven' model of capitalism prevails, providing environments that are more favorable to independent immigrant economic activities due to a greater spread of the free market. In continental European countries, a 'social market economy' model of capitalism prevails. On the one hand, they have more developed labor policies and more generous welfare policies, but, on the other hand, they have greater rigidities in allowing access to the market of independent labor. Just to give an example, it is relatively easy to get a taxi driver's license for an immigrant in New York and almost impossible in Milan. Given this diversity, I will discuss some examples of strategies of immigrant and ethnic entrepreneurs, mainly with regards to the present Italian situation.

Ethnic and migrant entrepreneurs tend to crowd in low threshold markets, where entrance rules are either rather inclusive or exclusive and loosely enforced, and where capital requirements and economies of scale are small. But a firm's chances of survival are smaller in low threshold markets (as shown by the high mortality rates of this kind of firms). Ethnic and migrant entrepreneurs who survive and grow are, therefore, those who possess resources to gain competitive advantages and set barriers for newcomers through product, process and marketing strategies, and who operate in market niches.

Typical examples of product innovation are found in new product mixes for leisure activities (for example, inter-ethnic food and music) and in new locations for old products (in clothing, home furniture, oriental medicine practices, etc.). Ethnic and migrant firm innovation takes advantage of the cultural hybridization and the expansion of consumer tastes, which are fostered by globalization. This kind of strategies runs against the thesis of economic assimilation in 'normal markets' as the key to ultimate success for ethnic and migrant entrepreneurs, as we discussed above.

Flexible employment practices, low-skilled tasks and externalization of costs through outsourcing are the most frequently applied strategies for process innovation among ethnic firms (Ram, 1994). Other strategies include the employment of irregular immigrant labor with low wages and no labor rights (Martinelli, 2002b).

In marketing, sales and distribution, the most frequently adopted strategies include the employment of low-cost new technologies - such as cell phones and internet - and the use of ethnic networks as channels for commercial distribution.

Cooperative strategies aimed at dividing business costs and at distributing financial risks are widely used too, often through the formation of networks of firms which can enjoy greater flexibility and greater adaptability to changing market conditions (Hollingsworth and Boyer, 1997).

A final word can be said with regards to ethnic entrepreneurship in the context of the mixed impact of globalization. Although situations vary in different countries and for different immigrant groups, one can suggest that, on the whole, benefits seem to be greater than constraints. First, globalization fosters an expansion of the horizon of consumer tastes, through cultural hybridization as in the areas of food, music, clothing, health practices, etc.

Second, it contributes to the growth of transnational ethnic communities which are

globally linked; these networks provide labor (not only unskilled but also technologically specialized labor), as well as capital (not only in the traditional way but also in the form of microcredit), outlets for products, and real estate developments linking ethnic communities in the home and host countries. On the other hand, major constraints are to be found in the various types of institutional discrimination, of cultural backlash, urban segregation patterns, and higher mortality rates of firms in the low-threshold markets open to immigrants.

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A HISTORIAN LOOKS AT ENTREPRENEURSHIP

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1. INTRODUCTION

Back to beginnings. I began my career as a graduate student long, long ago, after some years of service in the U. S. Army. The Army had taught me Japanese and thought to send me to occupy Tokyo, but I had my heart set on French history — memories of high school courses and French films. So I ran down to the Pentagon and got a lucky assignment to Biarritz, where the Americans had thought to set up a university for overeducated and overstimulated troops waiting for assignment to Japan. There I much improved my French vocabulary, made lifetime friends, and determined to return at the earliest opportunity.

Which I did. I took as my topic of concentration in graduate school French economic history. But not quantitative history. I was more interested in people than numbers. So I took as my subject French entrepreneurship, the study of businessmen and -women, their larger characteristics (what difference did it make to be French?), their performance as makers and traders. A wonderful subject — because it not only took me into the records and secrets of French business behavior, an interest otherwise much discouraged by the entrepreneurial class — but into their offices and salons. I got to know people, on the job and at home. That's what I call history.

When I began as a graduate student in history, almost sixty years ago, I chose to do economic history because it seemed to me that this was the most important, the most informative aspect of history. The dullards could do political or diplomatic history -- battles, elections, anecdotes. Smart people would want to know about the material aspects of human development: getting and spending; wealth and power; rich and poor; why some rich and some poor. I was not a Marxist; service in the army had cured me of any illusions about the virtues of command from above. But I was a believer in the pre-eminence of things.

So I took courses in history, economics, and economic history, the last of which, at Harvard, was taught by Abbott Payson Usher in the economics department. And thanks to a newly inaugurated program and center for research in entrepreneurial history, Arthur H. Cole director, I lived and worked with a range of social scientists, among them Talcott Parsons, economist by training, sociologist by practice, who introduced me to Max Weber and other authorities on the human and cultural aspects of economic behavior. This informal education was reinforced by years spent as junior fellow of the Society of Fellows: financial support, no degree obligations, freedom, freedom! plus weekly dinners with some of the

brightest people around. The biggest visitors to Cambridge came to these Monday evening gatherings and chatted with the eager fellows afterward. Sometimes one learned invaluable things about new directions of research; sometimes one listened to trivia. Isaiah Berlin came, gathered a throng of worshipful listeners, regaled them with tales of cheeses and good dining on the byroads of France. I gave up on that one. Berlin more than made it up to me later on.

It was as a junior fellow that I began work on my dissertation (one could obtain a doctorate at the end of one's term). My thought was to do something on French entrepreneurship, which in those early days I thought of as a contradiction in terms. I took a year to travel about France and look for documentation. Not easy, because French firms saw curious strangers as possible agents of the fisc; and since they were all looking for ways to fool the fisc, they could hardly afford to have nosy outsiders poking about. Here I was helped by my foreign status. As an American, I was unlikely to be looking for breaches of French tax law.

So I found a few firms ready to be helpful. The biggest find proved to be the records of one the great merchant banking houses, De Neuflize, Schlumberger et Cie of Paris, offices right across the street from the Bourse. When I look back now on this stroke of luck, I realize that part of my good fortune was due to indifference: the people then running the bank had no direct personal identification with their predecessors. In any event, they agreed to let me look around; nay more, to let me take home and work on the dossiers that interested me. Unheard of.

More luck. (The more I think of it, the most important asset in successful research is luck.) I was bringing a stack of papers back to the bank officer assigned to help me. We met every two weeks in the vaults of the Bank of France. One of the dossiers, I hadn't even looked at. It was labeled "Ottoman Affairs." What interest did I have in Ottoman affairs? But at the last minute I felt guilty. Did I have the right to return papers without even looking at them? So I opened the folder and found the most extraordinary correspondence between the bank in Paris and a correspondent in Alexandria, Egypt — detailed, personal, intimate, candid, immensely revealing. And there was my dissertation, later published as *Bankers and Pashas.*

Meanwhile economic history was changing around me. These were the birth years of the so-called new economic history — history by and for economists, full of numbers and calculations, guided by economic theory macro and micro. Inevitably, the matter of economic history changed with the technique: analyses of economic growth, estimates of the so-called residual and productivity, and other subjects that make for important but less than exciting reading. Except for a handful of stars who bridged the old and new worlds, most of the new work consisted of exercises in quantitative zeal and ingenuity.

The effect on the discipline may well be imagined. Where once membership at the meetings and contributions to programs divided more or less equally between economists and historians, the historians now tended to withdraw, along with their students: people who once would have trained in economic history now chose social or anthropolgical subjects.

In the United States things reached the point where economist-historians attended general historical meetings and, guided by topics offered, tried to recruit participants for forthcoming economic history meetings. A noble effort, but it is hard to participate, even by invitation, if one does not understand the techniques and vocabulary of the other side. Like having a thirty-course Japanese meal: best not to ask what one is eating.

Inevitably, this rift translated into major revisions. Where once students of North Atlantic

history explained the revolt of the American colonies against Britain in terms of resentment — of the taxes, levies, and restrictions of the mother country — now statistical measures proved that these burdens were relatively light, almost trivial. Not enough to justify or account for a revolution. Or were they? Numbers, it would appear, are not the same to one person as to another, nor the same in one context as in another.

In the same way, one of the great themes of economic history, the Industrial Revolution, became a battleground. Where an earlier generation of scholars had inherited and accepted this terminology, which went back to the mid-nineteenth century, and had buttressed the thesis by simple time series of outputs over time, the "new economic historians" chose to show their quantitative potency by the construction of aggregate models, masterpieces of ingenious extrapolation, interpolation, and imaginative invention. The effect, inevitably, was to round off the corners and tame the breaks and leaps. Finished the idea of rupture, of revolution, of a new direction; rather, now we had a gradual rise going back hundreds of years.

Ingenious calculation, but bad history. Fortunately, some of the "new economic historians" are still wedded to the principle that history should make sense as history. Thus the new book by Chris Freeman and Francisco Louçã, *As Time Goes By: From the Industrial Revolutions to the Information Revolution* (Oxford, 2000). And some of the old-timers are still writing, *viz.* my own "Fable of the Dead Horse; or, the Industrial Revolution Revisited," in Joel Mokyr, ed., *The British Industrial Revolution: An Economic Perspective* (Westview, 1993), and François Crouzet's *History of the European Economy, 1000-2000* (University of Virginia, 2000). There lies hope.

In the meantime, the cliometricians must take care. They feel superior to historians, but where do they stand within economics? Many applied economists feel that they are better equipped to analyze numerical data than their economic historian colleagues. And the state authorities and university hierarchies are showing their sense of the contribution, realized and potential, of economic history by liquidating the autonomous departments. Chairs go to economics or history, but no longer to economic history as such. I am told that the largest department of economic history is no longer to be found in Britain, once the home of the subject, but rather in Uppsala. Good for Sweden, but not for Britain.And not a good omen for the subject and its future.

None of this, though, generated the modern corporate business structure, for reasons implicit in Chandler's propositions. The economy and its business units were not yet big enough. That came with the railroad in the 1840's and 1850's. Here for the first time one had large enterprises dispersed in space, requiring heavy investment and maintenance in roads, rails, tunnels, and bridges, tight organization of rolling stock, all kinds of passenger and freight arrangements including timely service, mobilization of capital and handling of money income and outlays — in short a world of its own. Chandler noted here the critical contribution of men trained in the military academies, for armies were even earlier enterprises of vast scale, though more improvisational and transitory in character, and with destructive-predatory rather than constructive objectives. (The only comparable commercial enterprises to the railroads were the canals, but for topographical reasons, these were less important in the United States than in Europe. The one exception was Erie, but even there the waterway was soon lined with railroads). Chandler notes that in the 1840's, only 400 miles of canal were built, to make the nation's total canal mileage something under 4,000. In that same decade,

over 6,000 rail miles were completed, making the national total 9,000 Time counted, and railroads were faster and more efficient.

The introduction of such managerial and organizational techniques into industry waited on gains in scale of enterprise. The traditional manufacturing firm, for example, was a personal or familial operation, assisted by outside supply and demand facilities and initiatives — the shop writ large. Past a certain size threshold, however, ways had to be found to pull the parts together, to oversee, coordinate, and control. In the United States, it was the chemical and even more the automobile manufactures that led the way. Chandler is particularly well informed here because of his earlier work on Du Pont, with its subsequent ownership of a controlling share of General Motors.

G. M. itself tells a fascinating story of transition from personal to corporate enterprise.

It started with William C. Durant, a kind of freebooter who pulled together a number of independent manufacturers — Buick, Oldsmobile, Cadillac, Chevrolet *et al.* — and did his best to stay on top but ran into impossible financial impasses, personal and corporate. G. M. then fell into the hands of the bankers and money men: J. P. Morgan and Company and Pierre du Pont (rich from wartime earnings). And with the aid of manager Alfred Sloan, Jr., they set up a command structure that became a model for all manner of industnal enterprises.

Chandler's analysis would have been even richer had he made an explicit comparison between G. M. and the Ford Motor Company, because the latter is an exquisite, tortuous example of industrial gigantism under personal autocracy gone astray and awry. Ford was just the opposite of the Chandler prescription: all manner of organizational improvisation in the face of arbitrary whimsy. What the costs to Ford, no one will ever know: this was a company that estimated income and outgo by the height of piles of paper and had only an approximate idea of its debits and credits.When in money trouble, it taxed its dealers.

The move to a rational managerial system was bound to encourage professionalization.

One of Chandler's merits was not only to call attention to new schools and curricula, but to show how much could be achieved in the strangest places. Here again, his later comparative work filled out the American story along lines already explored by European scholars: the creation and transformation of professional schools to meet the needs of state bureaucracies; the differences in national achievement; the implications for the larger process of economic growth and development. Again, each industry had its own requirements and opportunities, just as each society had its own areas of preference. The British, who had accomplished much on the basis of apprenticeship and bench learning, were slow to adopt formal class and lab instruction. The Continental countries, especially Germans, French, and Scandinavians, strained to catch up via engineering and technological institutions and learned not only to transform the older branches but to advance in new areas of production. France particularly built much of its hopes for the future on professional schools with competitive exam-based admission and systematic ranking by performance. It was a way to encourage ambitions and aspirations, to locate talent, to systematize emulation, learning, discovery.

The growing reliance on professionally trained managers entailed an assault on the structures and habits of personal and familial enterprise. This was particularly true of technologically complex branches of production, which found it easier to hire good people than to tame them. Inevitably, the people who ran the show nursed aspirations that contradicted family control, the more so as such experts often were remunerated by share options that gave them a piece of ownership. Growth, moreover, entailed mobilization of funds, whether via

bank loans or public sales of ownership shares, and this too often countered family interests.

By the same token, the success and resources of managerial corporations have made them the arch seducers of the business world. This is a new, major aspect of the shift away from family control: how can a family firm say no to such generous offers, often exceeding the prospect of immediate gains? The recent sale of Seagram by the Bronfman interests to the French conglomerate Vivendi is an excellent example of money trumping blood, marriage, and personal aspirations. Another is the purchase by LVMH (Moët Hennessy Louis Vuitton SA) of a number of Swiss watch manufacturers by way of establishing itself as a major player in the luxury watch trade. These acquisitions exemplify "what can happen to a small, family-founded business under the umbrella of a global corporate superpower with large financial resources. The chairman and chief executive of LVMH, Bernard Arnault, is known for sparing no expense to gain dominance in luxury brands as diverse as champagne and handbags." The manager of one of these family brands put it straight: "LVMH is prepared to overinvest in Ebel without short-time return. They know that to build up a luxury brand you need time and money"[1].

Chandler's model, like most powerful syntheses, simplifies reality. The world of enterprise is full of variants, of divers responses to the tensions and conflicts implicit in entrepreneurial strategy and in the personal circumstances and histories of business endeavor. The family firm has not disappeared and will not. New ones are created all the time. There is even an international fraternity of those family firms that go back more than two hundred years, Les Hénokiens, named after the biblical patriarch Enoch. And there are enterprises that somehow seem to blend the personal and managerial with such art that one is hard pressed to classify.

But Chandler's model, in combination with Chandler's extraordinary energy, has served as the standard, the measure, the incentive to further inquiry. A small library has appeared on this subject, and one has only to read the book Chandler edited with Herman Daems, *Managerial Hierarchies: Comparative Perspectives on the Rise of Modern Industrial Enterprise,* to appreciate the quality and versatility of the collaborators (Leslie Hannah, Jürgen Kocka, Maurice Lévy-Leboyer, Morton Keller, Oliver Williamson), the range of the scholarship, the opportunities for thought and reconsideration. The Chandlerian model is a monument to present and future scholarship, and *The Visible Hand* an example and encouragement to scholars everywhere.

Much of the work on enterprise, management, and business performance has concerned itself with problems of continuity: how to keep a firm working well, growing, diversifying over time. The issue is especially important where families are involved: how do they operate effectively from one generation to the next, given the distractions and temptations that accompany success? Much attention has gone to the question of recruitment: can the family generate the intelligence and talent required? Can it hire the expertise it needs without inviting challenges to control? Even more serious are the distractions, the pleasures, the opportunities for heirs to leave business behind. These may be transcended by family obligations, but only up to a point.

Much of the difficulty lies in the cultivation of connections, social, cultural, commercial.

These offer obvious advantages in business and politics as well as amusement, better perhaps in the short than in the long run. The pattern precedes the rise of modern trade and industry by centuries, for in the late middle ages, one already finds the noble aristocracies of Europe pursuing the kind of relationships that make for successful marriages and strong

dynasties. The new families that marked successful business ventures before and during the Industrial Revolution — say the eighteenth to twentieth centuries — pursued a similar strategy, with points of concentration linked to common commercial and technological concerns. One finds these interfamilial strong networks, for example, among the iron and steel firms of central and eastern France (cf. Wendel, Schneider, Demachy et al.); or among the British dynasties and firms of the Birmingham hardware area; or among the textile trades of southeastern England and New England. But one must not overlook the parallel network of shared conversations, parties, sports, games — the world of the mansion and chateau, of the luxury resorts and quasi-private hotels, of clubs and outings, and shared vacations. One has as a result a semi-closed world of people who not only know one another and enjoy one another's company, but who find in their special milieu the social and cultural sympathies that assure them good pickings.

There was a time, of course, when the older landed aristocracy looked down at the *nouveaux riches* of industry and trade; and this no doubt was good for both, encouraging the two groups to focus on their special interests. But over time, the new people made it a point to imitate their predecessors — the kind of emulation that can only hurt business endeavor. This kind of self-indulgence took greater hold in the twentieth century, when revolutions and new constitutional forms set limits to the roles and wealth of the old landed nobility, while the newcomers made it a point to mix upward. This pursuit of social promotion found support among the entrepreneurs of tony recreation and educational mingling: the owners of wealthy hotels (*palaces*), the operators of hunting lodges, cruise ships, and the like. These people had every reason to broaden their appeal to those who could afford such pleasures and attentions; and even to discriminate in favor of those clients whose very presence enhanced their prestige and attracted the aspirants for social promotion. Some of these chasers after a higher life made it a point to live in these hostelleries -- not simply visit but live permanently in conditions of luxury and the kind of service that might otherwise take years to train and master. But even when visiting, they are received by a management that has made it a point to know them and their tastes. From the moment they enter, they are *chez eux.* Residents of and visitors to the Ritz (*à la César Ritz*) anywhere or l'Hôtel de Paris or L'Hermitage in Monte Carlo can hold superb parties that meet the highest social standards. Small wonder that such a pattern has served as a key for admission to British and French high circles for foreign business fortunes — wealthy Greek or South American millionaires, for example. Needless to say, many of these wealthy retirees had long since left the enterprises that had made their fortune.

Along with this went an array of elegant finishing schools, usually serious in their pursuit of intellectual content, but even more devoted to the kind of sport and recreation that travels well and promotes access to the camps, beaches, clubs, and courts of the right people. I have had some of them as students, and they often do well, very close to the highest levels. Smooth talkers and keen discussants. They do not aim at academic careers, but they can hold their own in meetings and seminars or go on to serve as *demoiselles de compagnie* or as social representatives of families or business firms.

All this good living was not made to encourage family dynastic enterprise, especially in a world of ever larger firms resting on an ever more complex and difficult technological basis. Hence the emphasis on managerial capitalism, on the recruitment of technicians,

typically outsiders. But here too, the coming of a third age of social pleasure and quick rewards for executive takers and plunderers has had negative consequences for business performance. The financial arrangements offered top business executives since World War II have been such as to promote criminal abuses and discourage otherwise eager investors from believing the claims and promises of entrepreneurs and offering their wealth thereby to what would appear to be pretentious thieves.

Here is a brief report on one example. Tyco's former CEO and ex-finance chief were charged with stealing over $170 million. Prosecutors accused Dennis Kozlowski and Mark Swartz of running a "criminal enterprise" aimed at defrauding investors, saying the executives siphoned off company funds for their own use. Mark Belnick, the former general counsel, was charged with falsifying business records.

The company, needless to say, has since fired these and other executives who would appear guilty of these abuses and has declared that it has "uncovered a web of deception and personal enrichment … throughout its management ranks." At Mr. K's direction and without board approval, the company gave 51 high officials some $56 million in bonuses and $39 m. more to pay the taxes on the bonuses. The report went on to specify tens of millions of dollars in personal expenditures that Mr. K. made with company money:[2]

- a house in Florida	$30 m.
- co-op apt in N.Y.C.	1.3 m.
- 2d apt NYC	17 m.
- renovations thereto	3 m.
- furnishings thereto	11 m.
- rental NYC 1997-2001	13 m.

Among the diverse objects purchased by Mr.K. with company money to furnish these flats:

- traveling toilet box	$ 17,100
- dog umbrella stand	15,000
- shower curtain	6,000
- metal wastebasket	2,200

One cannot yet say what will happen there, but the authorities have made it a point to treat the accused in such manner as to shame them in advance of trial and verdict. Normally business people get all the benefit of the doubt; they are rich and important figures. Here the reverse has been true.

Journalists love this kind of gossip. They are the scavengers of the modern world.

A few words now by way of conclusion. Most, indeed almost all, of the work by economists on business enterprise has focused on numbers and quantitative performance. Far be it from me to reject these objective data, which matter both to students and investors. Unfortunately, their value varies with the competence and honesty of those who collect and prepare them, and these last can be influenced or bought by interested parties. All the more reason, then, to study and know the entrepreneurs and managers, to study people as well as things and techniques.

On that basis, one observes, how business enterprise follows cycles. It is in western Europe that one can follow its course through a thousand years of transformation and progress.

Over this period, other countries and civilizations, in Asia for example, have stagnated or even regressed. This contrast in comparative performance is in fact the main theme of the march to modernity.

The stages and cycles vary from one region or country to another, but one can distinguish three important phases

a) A period that runs from the end of the Middle Ages to the Renaissance (1400-1700). In that time, great Italian families like the Medicis play a major role.and their commercial success encourages political aspirations. Access to power then leads to abandonment of business.

b) The beginnings of modern times (1700-1850). New countries in northwestern Europe rise to leadership, especially the Low Countries and the British Isles. Industrial technology improves, and one sees the beginnings of the Industrial Revolution. The entrepreneurs of this period marry in their own milieu, but as the old landowning and aristocratic elites become aware of the wealth of these rising newcomers, they widen their circle of marital eligibility. In the beginning, the bourgeois families hope to see their children continue to manage the family firm, and marriages with the aristocracy concern mainly their daughters. This new pattern yields two outcomes, out-marriage turns up new candidates for positions in the family enterprise; or it is seen as a possible exit from business, with concomitant gain in social status. Over time, the second outcome predominates.

c) Modern times (from 1850 on). Enterprise changes character, becoming ever more technical and complex. It depends increasingly on outsiders — engineers and managers — to do those things the owners can no longer handle. At the same time, social advancement leads descendants to engage in activities that have nothing to do with the family enterprise.

These outsiders (managers), more numerous all the time, do not feel bound by family traditions and tacit obligations. They are on the lookout for ways to get richer and would as soon sell the old enterprise as run it, the more so as the heirs are busy elsewhere. Paradoxically, all of this only enhances the importance of family ties. Family firms continue to exist and can make a major contribution to economic growth. But only so long as they are ready to meet competition.

NOTES

[1] International Herald-Tribune, February 5, 2001, p. 11.

[2] N Y Times, 18 September 2002, p. C1: “Tyco Details Lavish Lives of Executives”

VENTURE CAPITAL AND THE GROWTH OF INNOVATIVE FIRMS IN EUROPE

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1. INTRODUCTION

The ability to encourage and sustain technological innovation is one of the main sources of economic growth. In the last decade, the increasingly rapid pace of innovation induced by entrepreneurial firms has substantially contributed to the strong competitiveness and protracted growth of the US economy. Several studies have documented the ability of US venture capitalists to select promising companies, provide adequate financing, and spur innovative firms to behave aggressively and emerge as market leaders (see, among others, Gompers, 1995; Gorman and Sahlman, 1989; Hellmann, 2000 for an overview). A wide consensus among economists, business leaders, and policy-makers exists that a vibrant venture capital industry is a cornerstone of America's leadership in the commercialization of technological innovation, and that the lack of venture capital hinders European firms from competing on an equal footing (European Commission, 1998).

In this paper we provide the first systematic analysis (to the best of our knowledge) of venture capital in Europe. To get around the lack of firm-level data on European venture capital, we exploit the unique opportunity offered by the opening in 1997 of Euro.nm, the alliance of Europe's 'new' stock markets for innovative companies in high-growth industries along the lines of America's Nasdaq. Euro.nm brought under its wings the 'new' markets of Amsterdam, Brussels, Frankfurt, Paris, and (since June, 1999) Milan. Euro.nm ceased to exist as an alliance in December 2000, but its five members have continued to operate independently, at least until the Neuer Markt has been reorganized within the restructuring of the Deutsche Börse. Over its life span, Euro.nm has allowed nearly 600 companies to list and raise over 40 billion euros of equity capital (Bottazzi and Da Rin, 2002a).

The evidence we provide challenges several common beliefs on the role of venture capital in Europe, and questions its ability to make a difference for economic growth and job creation. In particular, we argue that venture-backed companies do not grow and create jobs faster than non venture-backed companies. Whether this is due to a lack of 'stars' among European firms or to the immaturity of European venture capital is not possible to tell apart,

but several pieces of evidence make the latter possibility more likely. We also have good news. We find that venture capital does help European innovative companies by providing them with financing crucial for their creation and development. This implies that an increasing number of (venture-backed) companies benefits from the possibility to go public, with a positive effect on the growth of Europe's 'new' stock markets. Since venture capitalists benefit, in turn, of the possibility to exit their investments through a listing on a stock market, this may have triggered a self-reinforcing virtuous circle. The high birth rate of venture capitalists, and the increasing importance of independent limited partnerships among them may also be signs that a virtuous circle may be helping European venture capital to mature.

The rest of the paper is organised as follows: Section 2 describes our data set and studies which characteristics of a firm are associated with receiving venture capital financing. Section 3 evaluates the role of European venture capital in the companies it finances. Section 4 concludes.

2. VENTURE-BACKED COMPANIES IN EUROPE'S "NEW" STOCK MARKETS

The first step in assessing the contribution of European venture capital to the creation of innovative companies and of new employment requires a quantitative look at the state and structure of the European venture capital industry. Aggregate data show that European venture firms are growing fast in Europe. This is good news, for at least two reasons. One is that numerosity is a sign of maturity: The second is that a large part of Europe's venture capitalists are what the jargon defines 'captives', i.e. subsidiaries of industrial companies or financial institutions (typically banks)[1]. Captives are not the most aggressive among venture capitalists (Hellmann, Lindsey and Puri, 2003), and corporations may invest with strategic goals different from financial returns (Gompers and Lerner, 2000; Hellmann, 2002).

Many of the recent venture capital firms are instead US-style, independent, limited partnerships specialized in some segments of the industry. Their arrival adds to the ability of the industry to cater to different needs, possibly changing the way venture capital operates in Europe.

Has the growth in the size of the industry corresponded to a growth in its ability to support the creation of innovative companies, or not? The only way to obtain a convincing answer is to turn to firm-level data. Here we face serious obstacles. While in the US comprehensive and reliable commercial databases on venture partnerships and venture-backed firms exist since the 1970s, in Europe systematic data collection of this sort has begun only very recently. We therefore develop a unique hand-collected data set that contains information on the involvement of venture capital with companies which listed on Euro.nm between 1997 and 2001. Venture-backed companies constitute a substantial part of Europe's new public companies: Bottazzi and Da Rin (2002b) show that nearly 40% of the listed companies were backed by at least one venture capitalist. The proportion of listed companies which receive venture finance has also doubled since the opening of Euro.nm, a trend which is most noticeable in Germany. As regards the extent to which European venture capital has been involved with listed companies we know that nearly one third of European venture capital firm was involved with companies which listed on Euro.nm.

Looking only at companies which make it to the stock market has the obvious limitation

of disregarding what happens to those which are still private, or choose to remain so. However, in our case this limitation should not be too much of a concern. The ability to bring companies public is one of the key abilities venture capitalists boast about with institutional investors, since IPOs are the most lucrative exit from a venture investment, on average four or five times more profitable than acquisitions (Gompers and Lerner, 1997).

Since venture capitalists are profit-seeking organizations we would then expect them to bring as many of their portfolio companies public as possible, and since they crucially rely on reputation for raising new funds, we would also expect them to select the most promising firms. Therefore we expect that we might over-estimate the impact of venture capital on corporate growth by looking only at listed companies, a possibility we will return to in the interpretation of the data.

An advantage of looking at Euro.nm listed companies is that they belong to a small number of high-tech industries, are of fairly similar age, and come from a small number of countries. This makes them a relatively homogeneous group of companies where we naturally find a reliable control sample, avoiding sample design problems. Focusing on listed companies also has the considerable advantage of obtaining detailed information, thanks to the tight disclosure requirements of Euro.nm.

2.1. The data sets

We have developed our data set collecting information from the listing prospectuses and annual reports of companies which went public on Euro.nm since its inception to December 2001[2]. Listing prospectuses are valuable for studying the role of venture capital in innovative companies because they contain detailed information on the financial and business situation of the company. Such information is not confined to the IPO year, but extends back in time, typically for three years. We also collect data for all the available post-IPO years from annual reports. We use prospectuses and annual reports to derive quantitative information on several financial and business variables. Our data set, which does not include sixteen companies in financial services, consists of 527 companies[3]. Finally, we collect data about financing from venture capitalists and their involvement with these companies[4]. We were able to collect data on the extent of ownership and on the timing of venture capital financing, while the exact amount of funding generally remains undisclosed. The Data Appendix contains a list of the variables we use in this study with their definition[5].

2.2. Which companies are venture-backed?

Before proceeding to the analysis of the effects of venture capital we want to know which characteristics of a firm are associated with receiving venture capital financing. Theory predicts venture capital to be associated with young, innovative companies that, being at an early stage of development, are characterised by low profitability and a small amount of sales[6]. We expect our findings to conform to the predictions of the theory.

We estimate a Probit regression in which the dependent variable is a dummy variable that takes value one if a company has obtained venture capital financing. To avoid endogeneity

problems, the independent variables are measured before the arrival of the first venture capitalist ('preVC')[7].

Unfortunately we cannot use in this analysis all the companies in the data set, since there are some missing observations, and since 30 companies, i.e. 14% of the venture-backed companies in our sample, have received venture capital funding before they started reporting accounting information. Still, this leaves us with 367 companies.

Table 1 reports the results of the Probit regression. We find that higher sales negatively affect the probability of obtaining venture capital financing. However the effect is close to zero. Leverage and ROA (return on asset) have a positive, but statistically not significant, effect. Sectors of activity are found to have no effect, with the exception of software and TLC - whose effect is negative and statistically significant. A dummy that takes care of the national effect was also used to capture the higher proportion of French venture-backed companies.

Table 1. What determines venture financing?

Independent Variable	Marginal increase in the probability to receive venture financing	Coefficien	z-statistics
Sales (pre VC)	-9.59e-10	-2.78e-09*	0.092
Leverage (pre VC)	0.0220	0.064	0.429
ROA(pre VC)	0.0017	0.005	0.570
France	0.1110	0.308*	0.075
Number of obs.	367		
Log likelihood	-223.45		
Wald_^{2}(9)	10.54		
P-value	0.000		

*Notes: The table shows the resultsof a Probit regression, where the dependent variable takes value one if a firm is venture backed, and zero otherwise. The label 'preVC' denotes variables measured before the arrival of a venture capitalist. Significance levels are indicated by * (10%), ** (5%), and *** (1%). Huber-White corrected standard errors are used to obtain robust estimates.*

Our findings are consistent with a view of venture capital getting involved with firms which are still at a very initial stage of development and are therefore not yet able to sell.

However, a marginal increase in sales decreases only infinitesimally the likelihood of receiving venture financing, an economically small but statistically significant result. The positive effect of leverage is consistent with a view of venture capital as an important source of financing. In other words, the 'hard' side of venture capital goes well along its 'soft' side.

Alternative (unreported) specifications have considered the level of debt, its maturity and the amount of assets as possible determinants of venture financing. We have done so to check whether companies whose debt is mostly short-term might suffer from tighter credit

constraints, and might therefore look more aggressively for venture financing. All these variables turn out to be statistically insignificant, and in all specifications the quality of the fit worsens.

3. VENTURE CAPITAL AND THE FINANCING OF EUROPEAN INNOVATIVE COMPANIES

We now turn to the core of our analysis. Our goal is to provide a rigorous assessment of whether European venture capital helps select and nurture the most dynamic innovative companies, so as to provide guidance for informed policy: Venture capital is expected to provide valuable support to portfolio companies, and that it is indeed found to do so in the US. Does European venture capital also provide the companies it finances with 'hard' and 'soft' support able to make them the 'superstars' among innovators?

A number of studies conducted for industry associations portrait venture capital as conducive to job creation and to the growth of technologically oriented firms. Venture-backed firms are found to grow faster, create more jobs, and export more than established firms. For instance, between 1993 and 1997, British venture-backed companies increased employment by an yearly 24%, and sales by an yearly 40%. By comparison, employment at the hundred largest British listed companies grew by 7%, and sales by 15% (BVCA, 1999). On a European scale, between 1991 and 1995, employment at venture-backed companies grew by an yearly 15% and sales by an yearly 35%, as compared to 2% and 14% for the 500 largest European listed firms (EVCA, 1996).

Suggestive as they are, these studies are based on a few 'stylized facts' which are still to be rigorously tested[8]. At least two problems make their findings unconvincing. First, they suffer from severe survivorship bias, since they only look at successful start-ups without considering the much larger number of those which failed. A correct comparison should look at both winners and losers, taking into account that small and medium enterprises (SMEs) suffer from a high mortality rate (OECD, 1998). The contribution of SMEs to economic growth or net job creation is in fact far from obviously positive, and has been recently challenged in a series of studies (see Audretsch and Thurik, 1999). Second, these studies compare venture-backed firms with large firms, which are, by their nature, less dynamic (Davis, Haltiwanger and Schuh, 1996). A correct comparison should instead pit venture-backed against non-venture-backed start-ups. These studies, therefore, are unable to separate the effects of venture capital financing from those of being a (naturally fast-growing) start-up, and risk to capture effects due to a spurious correlation between being a start-up and receiving venture capital. In other words, it could very well be that the apparent vitality of European venture-backed firms is due to factors other than venture capital. A deeper analysis is therefore warranted.

3.1 Evidence on corporate growth

We base our analysis on the hypothesis postulates that the post-IPO growth of a listed company is 'venture capital neutral,' i.e. that there is no relation between the post-IPO growth

and the presence of a venture capitalist. Venture capitalists might indeed be attracted by the innovativeness of a firms, which could be unrelated to employment or sales. We take the IPO as a turning point in the life of these companies, because it provides them with the financial resources necessary to fully unfold their business potential. We have some plausible alternative hypotheses. A first alternative is that venture capital favours sales and employment growth through its ability to connect the firm with potential clients and suppliers and to attract additional funding. NVCA (1998) claims that US venture-backed companies created jobs at a 55% faster pace than other start-ups between 1992 and 1996, and Brav and Gompers (1997) find them to yield higher stock returns in the five years after listing. If that were indeed the case we would have a very nice piece of evidence to support the presumption of a positive macroeconomic effect of venture capital. An opposite alternative would see venture capital as detrimental to growth if its main goal is to realize a 'quick and dirty' capital gain at IPO and then leave the company to its own fate.

In examining how venture capital affects corporate growth a first piece of evidence comes from a systematic comparison of how venture-backed and non venture-backed companies behave. Table 2 reports the results of two tests. A Wilcoxon test looks at the difference in the averages of the medians of several variables pre- and post-IPO, where pre- and post-IPO are defined as the periods of (up to) three years before and after the IPO. We run this test for both venture-backed and non venture-backed companies. A Kruskal-Wallis sign-rank test looks instead at whether the averages of the medians of several variables differ in a statistically significant manner between venture-backed and non venture-backed companies, within the pre- and the post-IPO periods. Bold figures show those values which differ significantly across time and within the venture-backed and not venture-backed groups of companies. Underlined figures show instead, within the pre- and post-IPO periods, those values which are statistically significantly different between the two types of company.

Let's concentrate first on how variables differ across time. Here we find that virtually all variables vary significantly, with the only notable exception of profitability for venture-backed companies and R&D intensity for independent companies. This result confirms that listed companies do invest and grow substantially after the IPO, and that this does represent a turning point of their evolution.

Things become more varied when we look at differences between venture-backed and non venture-backed companies. Before the IPO venture and non venture-backed companies do not differ systematically. We find statistically significant differences in four variables: profitability, sales and employment, which are lower for venture-backed companies, and R&D intensity, which is instead higher. After the IPO, non venture capital backed firms become significantly bigger in terms of intangible assets, sales (which we interpret as a sign of maturity) and capital expenditure: both types of companies show the same level of leverage while the percentage of sales abroad by VC companies is much higher. We do not find a systematic difference between venture-backed and non venture-backed companies in terms of employment or equity — venture capital being linked to lower values.

Although the analysis of Table 2 is suggestive, it can not be considered conclusive.

We need to control for other characteristics of the firms in order to ascertain the true impact of venture capital financing on corporate growth. We thus turn to a more formal analysis, where we look at the effect of venture backing on the growth of employment and sales after

Table 2. What are the effects of venture financing?

		Pre-IPO	Post-IPO
Assets	no VC	14.3	55.3
	VC	10.7	45.5
Debt	no VC	4.3	16.6
	VC	3.8	11.4
Equity	no VC	1.7	34.9
	VC	1.4	28.1
EBITDA	no VC	1.08	2.4
	VC	0.2	0.7
Leverage	no VC	0.74	0.33
	VC	0.76	0.31
ROA	no VC	0.13	0.05
	VC	0.05	0.02
Sales	no VC	13.2	33.5
	VC	9.8	21.9
Employees	no VC	85	210
	VC	62	175
Capex	no VC	0.7	6.8
	VC	0.5	4.8
Foreign sales (%)	no VC	0.27	0.02
	VC	0.35	0.19
Intangible assets	no VC	0.21	7.7
	VC	0.24	3.6
R&D intensity	no VC	0.07	0.09
	VC	0.13	0.11

Notes: See the Data Appendix for definitions of the variables. For each variable we report the average of its median values for the (up to) three years before (Pre-IPO) or after (Post-IPO) the IPO. In the upper row we report values for non venture-backed companies (no VC), in the lower row those for venture-backed companies (VC). Bold values indicate a statistically significant (at 5% confidence level) difference of medians across time. Underlined values indicate statistically significant (at 5% confidence level) differences between venture-backed and non venture-backed companies.

the IPO. The model we have in mind is very simple: the capacity of an innovative firm to grow is a positive function of its ability to invest, which can be financed either from revenues or from external finance (debt or equity). Age, an indicator of the stage of corporate development, is also relevant since we expect younger companies to grow faster[9]. As before, we adopt an estimation method which eliminates gross outliers and employs robust standard errors.

Table 3 reports our results. The dependent variable is the average growth rate of employment in the period of (up to) three years after the IPO. Note that the dimension of our data set decreases both because not all companies report employment data and because we cannot compute post-IPO employment growth for companies which went public in 2001. We are then left with 363 observations. The results confirm our intuition. Cohorts of relatively younger companies and more profitable (in terms of return on assets, ROA) companies increase their employment although the effect is only marginal. Leverage, in particular, is not only statistically but also economically significant: A 10% increase in leverage means a company decreases its growth rate of 0.43% in the post-IPO period. Companies listed on the Neuer Markt experience a growth rate in employment which is 25% higher than other companies. Venture capital plays no role, as it brings to a decrease in the employment growth rate, which is however statistically insignificant[10]. Sectors of activity are also not statistically significant[11].

Table 3. Does venture financing help companies create jobs?

Independent variable	Coefficien		t-statistic
Venture capital	-0.066		-1.01
Leverage (at IPO)	-0.043	* * *	-2.90
Age*1998	-0.000	* *	-1.90
Age*1999	-0.000	* *	-1.72
Age*2000	-0.001	* *	-2.21
ROA (at IPO)	0.000	* *	1.11
Germany	0.25	* * *	3.50
Constant	0.322	* * *	2.17
Number of obs.	363		
F(12;350)	3.30		
P-value	0.000		

*Notes: The Table shows the results of a robust regression where the dependent variable is the average employment growth rate after the IPO. See the Data Appendix for definitions of the variables. All independent variables are measured at the time of the IPO. Significance levels are indicated by * (10%), ** (5%), and *** (1%). Huber-White corrected errors are used toobtain robust estimates.*

We now turn to post-IPO sales growth. Table 4 reports our estimates, which are based on a sample of 391 companies. The dependent variable is the average growth rate of sales in the period of (up to) three years after the IPO. The results do not differ much from those for employment growth. Older companies with a high ROA and leverage experience a lower sales growth rate: A 10% increase in ROA results in almost 0.02% lower post-IPO sales growth rate, and a similar increase in leverage creates 1% of lower sales, with strong statistical significance. German companies have a 45% higher sales growth rate. Venture capital financing remains ineffective: Venture-backed companies sell 5% more than the others, but the result is not statistically significant. Sectors of activity continue to hold no effect.

Table 4. Does venture financing help companies increase sales?

Independent variable	Coefficient		t-statistic
Venture capital	*0.053*		*0.47*
ROA (at IPO)	*-0.002*	***	*-2.19*
Leverage (at IPO)	*-0.104*	***	*-3.86*
Age	*-0.011*	**	*-2.87*
Germany	*0.45*	***	*3.62*
Constant	*0.934*	***	*3.30*
Number of obs.	*391*		
F (10;380)	*5.82*		
P-value	*0.000*		

*Notes: Robust regression - dependent variable sales growth All independent variables measured at the time of the IPO. Significance levels are indicated by * (10%), ** (5%), and *** (1%). Huber-White corrected standard errors are used to obtain robust estimates.*

Before turning to an overall interpretation of these results and of their meaning for the role of European venture capital, we need to tackle some limitations of our analysis. Our results could indeed suffer from two possible selection biases, on both observable and unobservable variables. We consider some robustness checks to confirm the validity of our results.

3.2 Robustness checks

In the previous sections we have tried to evaluate the impact of venture capital financing on the companies listed on Euro.nm. The 'evaluation problem', as it is known in the econometric literature, is the problem of correctly measuring the effect of a 'cure' — such as a policy

reform or a training program - on some variables (see Blundell and Costas Dias, 2000). The problem in evaluating a cure is that both observable and unobservable variables may be present, which might bias the estimates if not properly accounted for. In the impossibility of obtaining experimental data, different methods of evaluation have been adopted by researchers. We consider two different methodologies. One approach is known as the matching method, and mainly addresses the issue of bias due to incorrect control for observable variables. The second approach is known as the difference in differences method, and it is particularly useful in removing unobservable individual effects and common macro effects.

We thus re-evaluate the effect of venture capital assessing whether our previous estimates are subject to these biases.

3.2.1 The 'matching' method

What we have tried to measure in our analysis is the effect of being venture-backed on sales and employment growth. The problem is that being backed by venture capital is not random, as we have observed when we have estimated the probability of receiving venture financing.

As a consequence, the assignment process to venture capital might be determined by (observable) variables that potentially affect our dependent variable as well. If that effect turned out to be important, our previous estimates might be biased and our conclusions flawed. We then proceed to estimate the average effect of being venture-backed by using the matching method that we know help us reducing the bias due to specification error but possibly at the cost of losing efficiency. In other words we could obtain estimates with a lower statistical significance.

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Table 5. Nonparametric stratification estimates: Average effect of venture capital

	∞	*t-ratio*
Employment growth rate	0.028	0.184
Sales growth rate	-23.63	-0.64

*Notes: Significance levels are indicated by * (10%), ** (5%), and *** (1%).*

3.2.2 The 'difference in differences' method

Another method of evaluation is called 'difference in differences' (DID), and is helpful in addressing possible evaluation biases due to the effects of unobservable variables which could be driving the difference in behaviour of the two groups we are trying to compare, venture-backed and non venture-backed companies. The name of the DID estimator comes indeed from the fact that it compares the difference in the average behaviour before and after the IPO for the eligible group (venture-backed companies) with the behaviour before and after the IPO of the control group (non venture-backed companies). Notice that we compare behaviour around the IPO since we need to pin down the effect of venture capital (the 'cure') on how venture-backed and independent companies react to a common external shock (the IPO). We denote the estimator with μ, which measures the amount of growth of venture-backed companies in excess to that of non venture-backed companies.

Table 6 shows the results of the DID estimator for the post-IPO growth in employment and sales for the two groups of companies. Our estimated effects confirm the sign of the coefficient of the matching estimator, although their significance is now higher. The value becomes larger for employment growth and smaller for sales growth. There are two possible weaknesses of the DID estimator. One is due to the lack of control for unobservable (temporary) individual specific components that might influence the behaviour of both groups. The DID estimator might then over-estimate the effect of the cure. This is a possible explanation of the higher value for employment growth in Table 6 than in Table 5. A second weakness of the DID estimator is that the assumption of common macro effect across companies. If the two groups have some characteristics which distinguish them and make them react differently to the common shock, we may get inconsistent estimates.

Table 6. Difference in differences estimates: Average effect of venture capital

	∞	*t-ratio*
Employment growth rate	0.38	1.24
Sales growth rate	-.18	-1.08

*Notes: Significance levels are indicated by * (10%), ** (5%), and *** (1%).*

4. VENTURE CAPITAL IN EUROPE: SOME CONCLUSIONS

We are now able to provide an initial assessment of the role of venture capital in Europe, and of its ability to contribute to economic growth and job creation. We focus on the effect of venture capital on some of Europe's most successful innovative firms, those which made it to list on one of the 'new' markets. Here we can apply formal statistical analysis to sharpen our arguments. On the basis of the theoretical literature, and of empirical studies of US venture-backed firms, we have explored the effect of venture capital on their ability to

generate revenue, and to create jobs.

We find that venture-backed companies do not create more new jobs than others while generate more sales. This result, however, is not statistically significant. This happens also when we restrict our sample to the more innovative companies, those which perform R&D, where the venture-backed ones appear to increase their sales more than the others[12].

Robustness checks to detect possible biases in our analysis confirm that these findings are not robust, and that in fact the effect of venture capital on corporate growth might be very weak. Venture-backed companies, therefore, are not the 'superstars' among those listed on Europe's 'new' stock markets — at least when we measure performance in terms of sales and employment growth. While we cannot eliminate all reasonable doubts on the possibility of selection biases, the empirical evidence we uncover does support the idea that venture-backed listed companies are not systematically different from non venture-backed companies, and that they do not grow faster, either before or after the IPO.

One possible interpretation is that the role of venture capital in Europe is somewhat different than in the United States. The provision of early stage financing, which has grown very fast in the past three years, seems to be crucial to allow innovative start-ups to overcome credit constraints, which are arguably tighter in the old continent. Whether the lack of a systematic association with the most successful innovative companies is due to the immaturity of European venture capital or to a lack of 'superstars' among European firms we cannot say at this stage.

While the nature of our data clearly makes it difficult to distil truly conclusive results, ours is a pioneering attempt and we have to make do with available data. For instance, we cannot observe the intrinsic quality of portfolio companies, nor the actual behaviour of venture capitalists to assess if some of them may be more effective than others in nurturing innovative businesses. With this study, we hope to have cast some doubts in the conventional evaluation of venture capital in Europe, and to have offered suggestions for further research.

NOTES

[1]See Bottazzi and Da Rin (2002).

[2]We obtained the listing prospectuses and annual reports in several ways. Whenever possible, we downloaded electronic copies from the company (or stock exchange) web site. For prospectuses which were not electronically available, which was often the case for earlier years, we contacted the issuing company by phone, fax, or e-mail. In some cases we photocopied the documents at the relevant stock exchange. Overall, we collected 527 prospectuses out of 567 IPOs which took place in the sample period, or 92% of the total. We also collected 1,790 annual reports, about 94% of the total.

[3]Companies in the financial services sector are not considered because their financial structure, funding requirements and strategic behavior differ substantially from those of industrial and (non-financial) services companies.

[4]The process of identification of venture capitalist was made particularly difficult by the fact that, unlike for banks, no standard identification criterion is available. We thus put particular care in extracting relevant information from our sources. This turned out to be an extremely time-consuming task which required careful search of each single prospectus and cross-checks with other public sources.

[5]The details on the construction of the venture capital data set can be found in the mimeo version of the paper which available upon request.

[6]We are not aware of any statistical study of the determinants of venture financing for the US, except for Hellmann and Puri (2000), who look at a sample of venture-backed start-ups and find that those which pursue more radical innovations are more likely to attract venture capital.

[7]For non venture-backed firms, we use the average of the pre-IPO values. We also experimented with alternative measures, such as measuring variables in the years before the average date of entry of venture capital in venture-backed companies, but we found no substantial difference in the results. Hence we stick to the simpler pre-IPO measure.

[8]Stimulating case studies on the difficult gestation of European venture capital in the 1980s and 1990s are provided by Becker and Hellmann (2000) and by Freeman (1998)

[9]In unreported results we add a dummy whose value is one when a company declares in the IPO prospectus its willingness to expand the market for its products outside its domestic domain. We believe the willingness to export to be a characteristics of more dynamic companies, since expanding beyond one's domestic market requires the ability to sell truly innovative products and services. However, this variable does not turn out to be significant.

[10]In alternative, unreported, specifications we control for capital expenditure, the level of debt (relative to asset) and its maturity, but this worsens the statistical significance of individual variables and of the regression.

[11]In unreported regressions we control also for R&D expenditure. To avoid an issue of simultaneity and of reverse causality we measure R&D at IPO. This variable turns out to be weakly statistically significant : R&D performing firms have a 13% lower growth rate in employment. Leverage and the Germany dummy remain significant and retain (or even increase) their size and sign, while ROA becomes statistically insignificant. Venture capital turns out not to be relevant and retains its negative effect on job creation.

[12] We provide such estimates in the working paper of this article (Bottazzi and Da Rin, 2003).

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APPENDIX

The following is a list of definitions for all the variables we use.

AGEIPO is the age of a company at the date of its IPO. To determine a company's date of birth we employ the earliest evidence of business activity in the listing prospectus, which need not coincide with the date of incorporation. In fact, several companies were born as partnerships or limited companies before incorporating.

VC is a dummy variable that takes the value 1 if a company has received venture capital financing, and 0 otherwise.

BIOMED, FINSER, ITSIS (comprising Internet, IT services, and software), MEDIA & EN-TERNAINEMENT, TECHNOLOGY, TELECOMMUNICATIONS, and TRADITIONAL (products and services), are dummy variables which take the value 1 if the company operates in that industry and 0 otherwise. These sectors are derived from Datastream, which in turn employs the Financial Times sectoral allocation.

ASSETS is current total asset.

DEBT is the sum of commercial and financial debt.

EQUITY is total shareholders' equity.

EBITDA is earning before interest, taxes, depreciation and amortization.

LEVERAGE is DEBT divided by DEBT plus EQUITY.

ROA is EBITDA over ASSETS.

SALES is total revenue from sales of goods and services.

EMPLOYEES is the total number of employees at year end.

CAPEX is capital expenditure, i.e. investment in tangible and intangible fixed assets.

FOREIGN SALES SHARE is the share of foreign sales over total sales.

INTANGIBLE ASSETS equals the capitalized amount of goodwill, patents, software and advertising.

R&D is current expenditure in research and development.

R&D INTENSITY is R&D over ASSETS.

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FOSTERING ENTREPRENEURSHIP IN ESTABLISHED FAMILY FIRMS

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1. INTRODUCTION

The unique ownership and governance systems, structures, strategies, and organizational cultures that pervade family firms are depicted as having mixed effects on these firms' ability to innovate, take risks and proactively pursue entrepreneurial opportunities.

Some authors are convinced that direct involvement of owner-family members in daily business activities as well as in strategic decisions frequently results in the long-term commitment of the firm to continued entrepreneurial behavior. Moreover, the substantial identification of ownership and management often characterizing family firms usually results in reduced agency problems and consequent increased managerial dynamism (Gomez-Mejia et al., 2001; Habbershon and Williams, 1999; Zahra, 2001).

Other authors believe that the same family-firm characteristics, combined with the dynamics of owner-family relationships, can encourage conservatism. Some research suggests that some family firms are slow to adopt new technologies, internationalize their operations, or engage in entrepreneurial risk taking (Bloodgood et al., 1996; Danes et al., 1999).

Given the crucial importance of entrepreneurial activities in determining the inter-generational viability of family firms, the contrast between these two perspectives on entrepreneurial capabilities in family firms should be addressed. In particular, a clearer picture of the antecedents of entrepreneurial behavior in family firms should be drawn. There is a strong need to understand more clearly what family-related factors and what governance, organizational and strategic variables enable or hinder entrepreneurship in these firms.

Most previous research on entrepreneurial behavior has not specifically investigated family firms. Moreover, the few existing studies on family firms and entrepreneurship suffer from three major weaknesses. First, they address family firms as a homogeneous class of organizations, without recognizing that they have a multifaceted nature and that there are different types of family firms. Thus they highlight determinants of entrepreneurial behavior that may be relevant for some family firms, sharing common characteristics, but not for

others. Second, the few existing studies on the determinants of entrepreneurial activities in family firms rely on methodologies whose findings are not generalizable. Readers are left wondering if the rich and insightful relationships between organizational variables and entrepreneurial behavior traced in these studies also apply in different contexts. Third, family business literature has typically addressed firm-related and organizational-level antecedents of entrepreneurial behavior. It has been difficult to unravel the multifaceted role of individual characteristics of key company actors in determining family firms' entrepreneurial behavior.

Hence, questions such as how important are commitment, personal values and objectives, and past personal and professional experiences in determining family firm entrepreneurial behavior have yet to be convincingly addressed.

This study fills these gaps in the literature by exploring the role of individual commitment-related variables in determining entrepreneurial behavior in family firms. The paper offers three main contributions to the literature on entrepreneurial activities within family firms.

First, a survey study based on a large random sample of family firms offers a broad, generalizable picture of both individual- and organizational-level antecedents of entrepreneurial activities in these firms. Among these variables, individual ones — related to previous professional and training experiences — are particularly relevant in explaining entrepreneurial behavior. For this reason, we have attempted to further understand the influence of these variables on entrepreneurial activities through four follow-up cases studies. Second, the survey distinguishes among three different types of family firms, separately analyzing entrepreneurial behavior in *founder-based, sibling/cousin-consortium* and *open* family firms. The analysis highlights a result which has been overlooked by previous research. variables explaining entrepreneurial behavior in one type of family firm almost never prove statistically significant in explaining entrepreneurship in other family-firm types.

Third, analysis based on follow-up case studies illustrates some of the processes through which upbringing, education and previous professional experiences may foster values that are more directly related to entrepreneurial orientation in active family members.

We begin with a review of the relevant literature on the antecedents of corporate entrepreneurship, developing separate hypotheses for each one of the three family firm types considered in our study. We proceed by illustrating the main methodological choices of the survey study and the characteristics of the investigated random sample of family firms. Next, we describe the results of the survey study and the different antecedents emerging for each type of family firm. We critically discuss emerging results and the need for a follow-up investigation based on case studies. The outcomes of these follow up case studies are presented, describing the influence of upbringing and education of family members on entrepreneurship-enhancing values. We conclude with a discussion of the research and practical implications of our results.

2. ANTECEDENTS OF ENTREPRENEURIAL BEHAVIOR IN FAMILY FIRMS: THEORETICAL POSITIONING AND HYPOTHESES

Several researchers have investigated the factors that foster a firm's commitment to *corporate entrepreneurship* (CE) (e.g., Borch, Huse and Senneseth, 1999; Kanter, 1986; Lumpkin and Dess, 1996; Zahra, Neubaum and Huse, 2000). Among the most important factors are

individual or human resources and senior executives' continuous support to CE. The latter is in turn related to ownership and governance factors, as suggested by agency theory (Jensen and Meckling, 1976). What these studies have failed to accomplish is an analysis of the different impacts these variables may have on CE in different firm types. Based on a review of both entrepreneurship and family business literature, in this section we present several hypotheses related to the relationships between individual and organizational variables and corporate entrepreneurship in each separate type of family firm.

Following Miller (1983), we defined CE on the basis of three related constructs: innovation, risk-taking and proactiveness. The scale we adopted was developed and validated by Miller (1983) and Covin and Slevin (1986). The terms in capital letters, within brackets, in the following hypotheses relate to the variables that have been measured in the survey. Measures used for each variable are reported in Appendix 1.

The relevant number of tested hypotheses and their composite nature (more than one independent variable is related to the dependent one in each hypothesis) reveal the partially exploratory nature of the present study.

3. INDIVIDUAL CEO CHARACTERISTICS

Resource-based view (RBV) scholars (e.g., Amit and Schoemaker, 1993; Barney, 1991) have suggested a relationship between the internal resource configuration of a firm and its competitive strategy. The relationship has been empirically tested in several different settings, including small firms (Borch, Huse and Senneseth, 1999).

Resources affecting strategic initiatives can be of different types, for example, human, social, organizational, technological, and financial (Greene, Brush and Brown, 1997; Hofer and Schendel, 1978). Given the focus of this study on individual variables and their relation with CE, we have limited our analysis to human resources. We have avoided an explicit treatment of social and technological ones and have addressed organizational and financial resources such as ownership and governance factors.

Individual variables clearly play a relevant role in fostering CE as defined in this study. All three dimensions of the CE concept (namely: innovation, proactiveness and risk-taking) are strongly influenced by individual behavior and, in particular, by the individual behavior of key actors (Kanter, 1986; Lumpkin and Dess, 1996). However, the same individual resource is likely to have a different impact on CE depending on firm type (Miller, 1983).

For this reason, we have developed separate hypotheses relating individual variables with CE, for each family business type.

Within *founder-centered family firms, characteristics* directly traceable to the founder will play a direct, relevant role in determining the firm's entrepreneurial activities.

From this standpoint, the CEO's perception of the firm's ability to develop promising entrepreneurial ideas and the CEO's ability to lead the firm towards successfully implementing such ideas are expected to be crucial in determining the firm's entrepreneurial orientation (Corbetta, 1995; Gersick et al., 1997). Founder-centered family firms are usually younger and smaller than the other two family-firm types. Hence, they are likely to be characterized by a smaller resource-endowment. The founder's tendency towards defining strategies on the basis of perceived opportunity — vs. resource availability — is also expected to positively

influence entrepreneurship. Established founder-centered family firms are often based on innovative entrepreneurial ideas that often lose momentum after a few years. The presence of active second- or, less likely, third-generation members may play a positive role in fostering the founder's entrepreneurial orientation (Corbetta, 1995; Gersick et al., 1997).

Companies that can be classified as a *sibling or cousin consortium* are characterized — as founder-centered ones — by a strong influence of the CEO or the top managers, who are usually family members or have been chosen by the owner family. Individual characteristics, such as the CEO's perception of the firm's ability to develop promising entrepreneurial ideas and the CEO's tendency towards defining strategies on the basis of perceived opportunity, are expected to positively influence entrepreneurship as in founder-centered firms. Unlike founders, however, successors are not innovative by definition they have to learn or absorb innovative capabilities. Previous experiences within the family firm, or in other firms operating in the same or different business areas, are likely to increase successors' entrepreneurial capacity. Hence, the hypothesis is that previous experiences will be positively correlated with entrepreneurship (Cooper, Woo and Dunkelberg, 1989; Carroll and Mosakowski, 1987).

Open family firms are characterized by a strong influence of external managers. Compared to family managers, external ones usually do not have a direct, personal interest in spurring the firm's entrepreneurial level. However, external, professional managers often tend to focus on growth, as this may increase their personal gams (Fama and Jensen, 1983). Growth orientation may push them towards innovative and entrepreneurial behaviors. Hence, the CEO's growth orientation will be positively associated with entrepreneurship. Aiming atgrowth without having sound innovative business ideas is very unlikely to result in true entrepreneurial innovations. Hence, besides growth orientation, the CEO's perception of the firm's ability to develop promising entrepreneurial ideas will also be positively associated with entrepreneurship. Unlike owner-managers, professional managers in open family firms are likely to prefer total control and ownership of the resources they use in order to take bold innovative actions. Hence, in open family firms, focus on resource control may be positively associated with entrepreneurship.These observations suggest the following hypotheses:

(H1-a) Within founder-centered family firms, the CEO's ability to develop promising entrepreneurial ideas (OPPORTUNITY SPOTTING), to lead the firm towards successfully implementing such ideas (CEO LEADERSHIP), and to define strategies on the basis of perceived opportunity (OPPORTUNITY-DRIVEN STRATEGY) is positively associated with CE.

(H1-b) Within sibling-cousin consortia, the CEO's ability to develop promising entrepreneurial ideas (OPPORTUNITY SPOTTING) and to define strategies on the basis of perceived opportunity (OPPORTUNITY-DRIVEN STRATEGY), and the CEO's previous business experiences (SAME- and DIFFERENT-INDUSTRY EXPERIENCE) are positively associated with CE.

(H1-c) Within open family firms, CEO's GROWTH ORIENTATION, ability to develop promising entrepreneurial ideas (OPPORTUNITY SPOTTING) and focus on RESOURCE CONTROL are positively associated with CE.

4. OWNERSHIP STRUCTURE

Besides human resources and individual variables, a firm's governance system (addressed in the next sub-section) and its ownership structure (Bird and Wiersema, 1996; Jacobs, 1991; Jones and Butler, 1992) are two potentially relevant sources of influence on managerial support for CE. Previous studies adopting an agency-theory approach (Jensen and Meckling, 1976) have empirically demonstrated that senior executives' support for CE is higher when they own stock in their companies or when a significant shareholder, who appreciates the value of long-term investments, controls and spurs executives to actively pursue CE activities.

The rationale behind these phenomena is that increased ownership makes executives' wealth more dependent on their company's long-term performance. This gives executives both the incentive to pursue long-term CE initiatives (Jenkins and Seiler, 1990) and the empowerment to initiate and champion them (Finkelstein and D'Aveni, 1994). Similarly, if the company's CEO and its directors fail to pursue CE initiatives, then institutional investors may have a major incentive to monitor CEO's decisions and commitments to CE (Bird and Wiersema, 1996; Zahra, Neubam and Huse, 2000).

Despite these insights, few studies have addressed the issue of how ownership-related variables affect CE in different firm types. Previous research has shown that the effects of ownership factors can vary across firms of different sizes (Kroll, Wright, Toombs and Leavell, 1997; Rediker and Seth, 1995). Existing literature suggests that ownership factors may affect innovation and venturing efforts differently in small and medium-size firms than in larger firms. In small and medium-sized firms, which are often younger than larger ones, founders may continue to play active managerial roles, aligning the interests of managers and other shareholders (Kuhn, 1989). As predicted by agency theory, this will enhance long-term value creating activities such as CE and, in turn, the firm's bottom line (Finkelstein and D'Aveni, 1995; Wright and Ferris, 1997; Zahra, Neubaum and Huse, 2000). Institutional investors may also play different roles in fostering CE in different firm types. Several empirical studies suggest that the effect of institutional ownership on managers' support for CE is better understood by distinguishing among different types of institutional owners (Roe, 1994; Kochhar and David, 1996; Zahra, Neubaum and Huse, 2000). The different roles played by various institutional investors in different stages of a family firm's life (Corbetta, 1995) suggest different hypotheses relating institutional investors' role with CE in family firms.

Given that *founder-centered family firms* are likely to have smaller resource endowment, the availability of financial resources may prove crucial in stimulating entrepreneurship. Financial resources aimed at increasing the available amount of capital are likely to be scarce in families that have either recently founded or bought a firm. Hence, financial resources from external investors, namely venture capital and investment companies, are expected to be positively associated with entrepreneurship in founder-based family firms (Evans and Leighton, 1989).

A *sibling and cousin consortium* is characterized by significant family ownership control. Given that one or few related families can have access to limited financial resources,

financial resources from external investors, namely venture capital and investment companies, may be positively associated with entrepreneurship (Evans and Leighton, 1989). Sibling or cousin consortia are often characterized by internal dialectic among successors and this may be increased by the presence of external institutional stockholders. The presence of other, non-institutional and non-professional, investors may further increase internal decision — making complexity, up to the point of strategic stagnation. Hence, an additional hypothesis concerning ownership structure is that the presence of other non-family and non-institutional or professional investors may be negatively correlated with entrepreneurship.

In *open family firms,* external managers' incentives towards entrepreneurship may be increased by giving them a share in the firm's capital. Hence, the percentage of shares owned by a professional CEO and his or her family, as well as the percentage of shares owned by non-family members of the board and management team, may be positively associated with entrepreneurship (Fama and Jensen, 1983; Jenkins and Seiler, 1990; Jones and Butler, 1992; Zahra, 1996). On the contrary, the presence of external owners (i.e., other than family members and board or management team members) may have a negative impact on entrepreneurship, given their likely higher interest in short term results (Shleifer and Vishny, 1990; Porter, 1992). These observations suggest the following hypotheses:

(H2-a) Within founder-centered family firms, ownership by VENTURE CAPITAL and INVESTMENT COMPANIES is positively associated with CE.

(H2-b) Within sibling-cousin consortia, ownership by VENTURE CAPITAL and INVESTMENT COMPANIES is positively associated with CE, while ownership by non-family or non-institutional investors (OTHER INVESTORS) is negatively associated with CE.

(H2-c) Within open family firms, ownership by CEO, directors or managers (CEO OWNERSHIP, BOARD/MANAGEMENT OWNERSHIP) is positively related to CE, while ownership by external owners (INACTIVE OWNERS, INVESTMENT COMPANIES) is negatively related with CE.

5. GOVERNANCE AND ORGANIZATIONAL CHARACTERISTICS

The governance system and, to a certain extent, the organizational structure play an important role in monitoring, evaluating, compensating and disciplining executives (Roe, 1994; Zahra, Neubaum and Huse, 2000). Several empirical studies have suggested that a strong, independent and active board of directors can promote CE by monitoring and challenging executives to actively pursue innovation and corporate venturing.

According to several empirical studies, board size has an impact on the way directors perform their task and determines the potential impact on CE activities (Fama and Jensen, 1983; Haleblian and Finkelstein, 1993). However, this relationship is often described as curvilinear. Small boards may lack the expertise and skills to effectively influence company activities, given their limited information-processing capability. This may result in overemphasizing financial controls, at the expense of long-term entrepreneurial commitments

(Baysinger and Hoskisson, 1990; Haleblian and Finkelstein, 1993). Very large boards often suffer from communication as well as information-processing inefficiencies (Judge and Zeithaml, 1992; Sanders and Carpenter, 1998). While the effect of board size can be contradictory, the presence of external board members is usually seen as having a positive effect on a firm's capability to perform CE activities. Uncertainty and risk associated with CE activities often make boards that are dominated by insiders reluctant to foster these initiatives (Kroll et al., 1997; Wright et al., 1996; Wright and Ferris, 1997). As several studies have shown, board size and the number of external directors tend to change over a family firm's life cycle (Corbetta, 1995; Ward, 1991). Different hypotheses about the relation between these variables and CE may be developed for each different family firm type investigated in this study.

We have hypothesized the relevance of CEO individual and family-related aspects *within founder-centered family* firms. This implies that other organizational actors will not play a relevant role in determining the firm's entrepreneurial intensity. Hence, the presence of a relatively high number of managers and directors and the degree to which employees are evaluated and compensated on the basis of the value they add to the firm will not correlate significantly with the level of entrepreneurship (Jones and Butler, 1992).

Unlike founder-centered family firms, a *sibling or cousin consortium* may require the involvement of the whole organization in order to generate a sufficient number of innovations and be characterized as entrepreneurial. Hence, the following organizational and corporate-governance related aspects are hypothesized to be positively associated with the degree of entrepreneurship in a cousin or sibling consortium: the presence of a relatively high number of managers and external members in the board of directors, which increases the level of professionalization within the firm (Danco and Jonovic, 1981; Fama and Jensen, 1983; Jennings and Lumpkin, 1989; Ward, 1991); the degree to which employees are evaluated and compensated on the basis of the value they add to the firm (Jenkins and Seiler, 1990); and the degree of delegation and informality within the organizational structure (Lumpkin and Dess, 1996).

Open family firms are characterized by a high degree of managerialization and a lower dependence on strong individual innovative capacities, as in the case of founder-centered family firms. Their ability to introduce entrepreneurial innovations will heavily rest on the innovative potential of the whole organization. Hence, the degree to which employees are evaluated and compensated on the basis of the value they add to the firm may be positively associated with the entrepreneurial level of an open firm. According to the same rationale, the number of family and non-family managers and of board members will also be positively associated with entrepreneurship (Danco and Jonovic, 1981; Jennings and Lumpkin, 1989; Ward, 1991). Some authors suggest that, beyond a certain size, large boards become dysfunctional and may reduce the entrepreneurial level (Goodstein et al., 1994). This possibility is not considered here, given the small average board size of the small-medium firms of the sample.These observations suggest the following hypotheses:

(H3-a) Within founder-centered family firms, MANAGERIAL BODY size, BOARD SIZE and the presence of VALUE-BASED COMPENSATION systems are not significantly associated with CE.

(H3-b) Within sibling-cousin consortia, the number of managers (MANAGERIAL BODY) and EXTERNAL BOARD MEMBERS, the presence of VALUE-

BASED COMPENSATION systems and the degree of DELEGATION & INFORMALITY of the organizational structure are positively associated with CE.

(H3-c) Within open family firms, ownership by the CEO, the number of managers (MANAGERIAL BODY) and EXTERNAL BOARD MEMBERS and the presence of a VALUE-BASED COMPENSATION system are positively associated with CE.

6. CONTROL VARIABLES

Firm age and size (AGE and SIZE) are entered in the analysis as control variables. The hypothesis is that they are not significantly correlated with entrepreneurship. Given the broad representation of types and business activities characterizing the sample, industry differences should not affect the degree of generality of the findings and have not been controlled for.

(H4-a) Within founder-centered family firms, firm age and size are not significantly associated with CE.

(H4-b) Within sibling/cousin consortia, firm age and size are not significantly associated with CE.

(H4-c) Within open family firms, firm age and size are not significantly associated with CE.

7. METHODS AND DATA

To test the hypotheses we used a large, stratified sample of family firms. The sampling frame consisted of 24 cells, each comprising approximately 110 firms. Three sampling criteria were used: industrial sector, size classes, and corporate governance. The total sample consisted of 2455 firms. As it was impossible to single out family firms from the initial sampling frame (obtained from public sources), questions were asked in a mail questionnaire in order to identify family firms. The target respondent was the Chief Executive Officer. Data were collected in two steps. First, firms were contacted and surveyed by telephone, obtaining 2034 firms (82.9%). Second, all firms interviewed were sent a mail survey, resulting in 1278 replies. The overall response rate was 52.1%. Excluding cases with severe internal non-response, the sample available for the analysis has 1233 firms. We have analyzed three sets of antecedents: (a) *corporate governance structure and mechanisms* (Gersick et al., 1997), such as stake-ownership concentration, CEO duality, CEO personal characteristics and

composition of the board of directors; (b) the company's *strategic orientation* (Zahra, 1991); and *(c) family specific variables* (e.g., number of generations involved and number of family members directly involved in managing the firm). We have controlled for company age, size and industry type.

The relationship between these variables and entrepreneurial behavior has been separately investigated in each of the three different types of family firms in our sample. Previous studies investigated entrepreneurship determinants addressing family firms as a whole. The broad label 'family firm' was attached to an extreme variety of firm types, ranging from small, owner-managed, start-up firms to large and well-established, multinational, diversified groups. These studies describe variables that foster entrepreneurship in family firms in general, concealing the differences among family-firm types.

For these reasons, in the present work we have chosen to investigate the antecedents of entrepreneurship in different types of firms. In order to do this, we have developed an original typology, partially building on existing ones. Based on an in-depth literature review of family firm definitions and typologies, the following three types of family firms have been defined and their predictiveness empirically tested.

(1) *Founder-centered family firms* are those established firms in which the founder still plays a relevant role, either because succession has not taken place yet, or because he or she is still the majority owner. In founder-centered family firms the CEO is the founder or someone who has purchased the company. In the latter case, either a second generation is not active in the company yet, or the CEO still holds the majority of ownership. Hence, power is highly centralized in the founder's hands and characteristics directly traceable to him or her play a direct, relevant role in shaping the firm's major decisions and actions.

(2) *Sibling/cousin consortium* type of firms are those in which the second, third or later generations hold the majority of ownership and play a relevant managerial role in the company. Managers and owners external to the family may be present, but they do not play a major role in the company. These family firms are usually characterized by intense interplay among siblings and cousins and this is the major force shaping company activities.

(3) *Open family firms* are those in which no single family or group of related families possesses a majority ownership, the company is neither family-owned nor family-managed, and it is usually not perceived by top management as being a family firm (though some kind of family influence is present). This is the type of family firm in which family influence is least strong, given the higher level of external influence (both managerial and ownership). In these family firms decisions and actions are likely to be more influenced by a purely managerial rationale.

As a preliminary step in the empirical test of the predictiveness of this typology, we selected only established firms, i.e., firms that were established at least five years prior to

the study, obtaining a sub-sample of 1090 firms. We then applied a very broad definition of family firm to the sub-sample of established firms, obtaining a further sub-sample of firms (n=535). These firms, which can be broadly defined as family firms, have majority family ownership or are perceived by the CEO as being family firms. Based on their differences, we identified the three self-excluding family firm types described before: founder-centered family firms (n=230); sibling/cousin consortia (n=135); and open family firms (n=155).

As should be clear from the reasons stated above, the present study avoids giving *one* definition of family firm. Instead, established firms that are labeled as "family firms" according to the broadest possible parameters are then distinguished according to the typology illustrated above into three separate family-firm types.

8. RESULTS

Correlation and regression results are reported in Tables 1 and 2 respectively.

In Table 1 corporate entrepreneurship is correlated with potential antecedents for each family-firm type, first separately and then for the entire sample. Due to space constraints, only main correlations are reported. However, the Pearson's *r* between each pair of independent variables never exceeds .80. Moreover, multicollinearity tests show that independent variables tend not to be correlated with each other: the *Tolerance* factor is always above .40 and the *Variance Inflation Factor* is always below 2.5.

Two main results clearly emerge from correlation analysis. First, several variables among those suggested by the literature and pilot case-study are significantly correlated with entrepreneurship, though correlations are seldom strong. Second, for nearly all variables, correlations that are significant at the whole-sample level are significant for only one or two family firm typologies, but not for the others. In other cases correlations that are significant for one or two typologies are not statistically significant at the whole-sample level.

In Table 2 regression results are compared with hypothesized relationships. Stepwise regressions were run in order to enter in the regression equation only the most relevant and statistically significant variables. Most of the hypotheses areconfirmed, but there is a high degree of explanation of entrepreneurship only in the case of sibling/cousin consortium type of family firms, where nearly half the variability in the entrepreneurship dependent variable is explained (Adj. R^2=0.472). For the other two types, nearly one-fourth of the total variability is explained by selected independent variables.

9. DISCUSSION

Increasingly, long-term survival of family firms is described as a function of their ability to implement entrepreneurial activities. This study investigated the impact of several individual and organizational variables on CE, distinguishing among three family-firm types. This section discusses the key findings and illustrates the rationale of a follow-up study that was considered necessary to complete our research.

in all three types of family firms, confirming the belief, widely shared in the literature, that opportunity spotting is one of the basic determinants of entrepreneurship. While in the other

Table 1. Product-Moment Correlations of Variables with Entrepreneurship for three Types of Family Firms

Variables	Founder-centered family firms (n=230)	Sibling/cousin consortia (n=135)	Open family firms (n=155)	All types (n=535)
INDIVIDUAL-LEVEL VARIABLES				
CEO leadership experience	.22**	14°	01	.15**
CEO experience same industry	.02	-.17*	-.00	-.05
CEO experience other industries	.13*	. 09	-.02	.09*
CEO tenure	-.03	- .04	-.04	- .06
Opportunity-driven strategy	.27**	. 46**	.22**	.32**
Growth orientation	. 08	.21*	.30**	.19**
Opportunity spotting	. 26**	.40**	.34**	.33**
Resource control	-.01	.02	-.11	-.00
ORGANIZATIONAL-LEVEL VARIABLES				
Company age	.03	.21*	.14°	.09*
Company size (employees)	.20**	.23**	.08	.11**
Board size	.09	.14°	-.01	.10*
# external board members	.13*	-.03	.03	.08°
# board decision-making meetings	.19**	.08	.03	.13**
Managerial body size	.16*	.28**	.15°	.19**
More than 1 generation active	.12°	.02	-.01	.05
% owned by CEO's household	-.09	-.12	.04	-.09*
% owned by CEO's parents	.06	.01	.11	-.02
% other board & mgmt members	.04	.05	-.02	.02
% owned by inactive individuals	.12°	-.04	.14°	.12**
% owned by investment companies	.17*	.01	.17*	.12**
% owned by venture capital	-.09	.26**	.02	.09*
% owned by others	.02	-.20*	.05	.02
Delegation and informality	.16*	.28**	.15°	.19**
Value-based compensation	.23**	.16°	.27**	.23**

*The symbols °, *, and ** indicate that the correlations are significant at the 0.10, 0.05, and 0.01 levels respectively.*

Table 2. Multiple Regressions for Corporate Entrepreneurship in Three Types of Family Firms

Variables	Founder-based family firms (n=230)	Sibling/cousin consortium (n=135)	Open family firms (n=155)
INDIVIDUAL-LEVEL VARIABLES			
CEO leadership experience	0.21		
Opportunity-driven strategy		0.32	
Growth orientation			0.27
Opportunity spotting	0.19	0.31	0.22
ORGANIZATIONAL-LEVEL VARIABLES			
Managerial body size			0.16
More than 1 generation active	0.17		
% owned by investment companies	0.26		
% owned by venture capital		0.17	
% owned by others		- 0.19	
Delegation and informality		0.17	
Value-based compensation	0.32		0.27
ADJUSTED R^2	0.25	0.47	0.24
F (P < 0.01)	9.69	17.88	9.98

[a] *All reported coefficients are significant at 0.05 level or, in the majority of cases, 0.01. Standardized regression coefficients (Beta) are reported, given the often dramatic differences among measurement scales. The absence of an intercept in regression equations is the result of such coefficient standardization.*

As predicted, entrepreneurship in *founder-based family firms* proves to be significantly correlated with the presence of *second-generation members active* in the business. With regards to *ownership,* the share owned by investment companies is positively related to entrepreneurship as predicted, while the presence of venture capitalists is not. Contrary to expectations, *the way employees are evaluated* and compensated is positively and strongly correlated with entrepreneurship. As predicted, *control variables* (i.e., age and size) are not significantly correlated with entrepreneurship. The strongest results are those concerning the relationship between *individual CEO characteristics* and entrepreneurial activities. Results of correlation and regression analyses strongly support predictions related to the CEO's role in determining the level of entrepreneurship in founder-based family firms. The founder's perception of the firm's ability to keep developing promising innovative ideas proves to be strongly linked with the firm's entrepreneurial level. This is the only relationship that applies

two family firm types opportunity spotting tends to be coupled with organizational or on governance elements, in founder-based family firms it co-operates with other individual characteristics of the CEO, i.e. leadership, industry experience, and strategic orientation (the latter two emerging from correlation analysis in Table 1). In founder-based family firms — characterized by a smaller average size and resource endowment — strategic orientation proves to be positively related to entrepreneurship when it is oriented towards pursuing spotted opportunities regardless of the amount of resources currently controlled (instead of building on the existing amount of resources). As far as industry experience is concerned, previous experiences in other businesses seem to have a positive impact on entrepreneurial orientation while experiences in the same industry are not significantly correlated to entrepreneurship.

As suggested by the literature, previous experiences in the same industry may have an impact on the decision to start a new firm, i.e. on individual entrepreneurship. Examples and experiences drawn from different business environments are more likely to result in corporate entrepreneurship. As will be clear in the next typology of family firms (i.e. third generation sibling/cousin consortia), an extended experience within the same industry may even prove to have negative effects on entrepreneurial intensity, possibly because it makes it harder to look at the industry and market with fresh eyes. Finally, in founder-centered family firms, where leadership imperative usually prevails over shared and decentralized decision making, the founder's previous leadership experiences may help he CEO to put innovative ideas into practice.

For *sibling/cousin consortium* type of family firms, the main correlates of entrepreneurship are, as expected, the share owned by venture capitalists (but not investment companies), the degree of informality and delegation in the organization, and the ability to devise promising innovative ideas, coupled with a strategic orientation driven by opportunity perception (rather than resource control). Again as predicted, the presence of owners who are not family members, professional managers or board members shows a negative correlation with entrepreneurship. Contrary to expectations, the CEO's previous experiences in the same industry and the number of professional managers and external board members do not show positive correlations with entrepreneurship. As in the case of founder-based family firms, individual CEO characteristics play a crucial role in explaining entrepreneurship, although not always in the expected direction. Results about individual characteristics show support for some hypothesized relationships, as well as interesting and unexpected conclusions.

Hypotheses concerning the relevance of the perceived ability to spot promising entrepreneurial ideas and the tendency to define strategies on the basis of perceived opportunity are strongly supported. In other words, the entrepreneurial orientation of second — or third — generation closely-held family firms' still relies on top managers' ingenuity and on their attitude towards innovative strategies (i.e. whether they base them more on perceived quality of spotted opportunities than on actual quantity of available resources). Hypotheses relating to previous CEO experiences are rejected. Not only were CEO previous experiences in the same or other industries not entered in the regression equation, but experiences in the present industry showed a significant negative correlation with entrepreneurship. Previous leadership and management experiences, on the contrary, are positively and significantly correlated with entrepreneurial orientation. We can conclude that successors' training — aimed at

developing entrepreneurial capabilities - should focus on developing broad leadership skills, rather than specific, business-related knowledge. The focus in the literature on previous business experiences is aimed more at developing managerial — i.e., efficiency-related — skills, than truly entrepreneurial ones.

Finally, in *open family firms* only half of the expected positive correlations prove significant. These include managers' growth orientation and opportunity-spotting capability, managerial body size, and the extent to which employees are evaluated and compensated according to the value they add to the firm. All other correlations are not significant. Here, again, the focus is on individual CEO characteristics. Given the nature of open family firms, purely individual characteristics such as a CEO's previous experiences are likely to be unrelated to the firm's overall level of entrepreneurship, as correlation and regression results clearly show. But, as hypothesized, idea-generating attitudes and growth orientation play a positive, significant role in enhancing entrepreneurship. Opportunity spotting has been already discussed. Managers' growth orientation appears to be the major driving force of entrepreneurial processes in open family firms. The presence of external owners and managers may reduce the impact of family-related objectives such as long-term company survival and securing a managerial position for family members. In founder-based and subsequent-generation family firms these may be the driving forces behind many entrepreneurial choices.

In open family firms such objectives lose their strength in affecting strategic choices.

Professional managers' growth orientation remains a powerful driver of corporate entrepreneurship.

Results described so far suggest a strong, statistically significant impact of individual CEO variables on a company's entrepreneurial behavior. In other words, variables such as CEO's education, past professional experiences inside and outside the family firm, and individual motivation were found to significantly affect entrepreneurial activities in companies.

10. A CASE-BASED FOLLOW-UP STUDY

Quantitative methods are not well suited to explore the social, cultural and psychological factors explaining the role of individuals in fostering entrepreneurial behavior at the firm level. Moreover, our database did not allow us to gain an in-depth understanding of the role of upbringing and education in fostering individual antecedents of entrepreneurial behavior.

Therefore, we conducted a follow-up study based on a qualitative approach.

Despite the potential shortcomings that may result from the blending of quantitative and qualitative research, we think that a two-phase design may enhance the range and significance of our contributions (Creswell, 1998). The advantage of such a design is that it capitalizes on the strengths of two traditionally separate research orientations. OLS regression can inform on the calibrated effects of specific, deductively preselected predictor variables on the criterion variable (CE). The qualitative follow-up studies can inform on additional variables, processes, and conditions surrounding these calibrated effects.

We analyzed four family owned companies differing in size, industry, and family characteristics. Company sales range from 6 million Euros to 250 million Euros. They operate in the home heating, textile, and mechanical industries. Two of these companies are run by one founder and 3 to 5 siblings; one is run by two siblings; and one is run by an heir and an

external managing director (the heirs were two sisters but only one decided to join the business). In all four cases we focused on the transition from the first to the second generation.

The main goal of this follow-up study was to extend and refine the framework emerging from the previous empirical stage, in which we investigated several antecedents of siblings' entrepreneurial behavior. Among the variables affecting *entrepreneurial behavior,* we focused our attention on personal traits (Malone and Jenster, 1992; Goldberg and Woolridge, 1993), business knowledge (Correl, 1989), previous experiences (Ward, 1990; Lansberg and Astrachan, 1994), network ties (Birley, 1986), incumbent entrepreneurial behavior, and professional vocation (Novak, 2000). Besides entrepreneurial behavior, inductive analysis of case studies suggested a second dependent variable, strictly related to the previous one: *the decision by family members to enter the business.* Among the variables influencing the decision to enter the business we focused on two constructs. The first is the so-called 'will factor' (Tunkkari, 2001), which proved to be a good proxy for individual commitment. The second is 'freedom to act' within the family business, which depends on elements such as business growth rate and the incumbent's strategic intent.

According to established methodological literature (Eisenhardt, 1989; Pettigrew, 1988; Yin, 1994), cases were chosen in order to represent "polarized" situations, so that the topic could be studied in contexts allowing transparent observation.

The two topics mentioned above (i.e., variables affecting entrepreneurial behavior and the decision by family members to enter the business) were analyzed within four family businesses. These four companies are all family-owned and can be classified in the 'sibling consortium' type. We focused on the transition between the first and the second generation. In three out of four cases some siblings decided to enter the business while others preferred not to join or to leave once they had tried. Only in one case had all three brothers joined the company and are still running the business.

All four companies are medium sized and active in manufacturing industries characterized by moderate to medium growth rates (see table 3).

We only interviewed members of the second generation, discussing with them the decision whether or not to enter the business, the training path followed by second generation members, and the relationship between the decision to enter the company and the kind of education received. We were also told about the birth and development of an entrepreneurial activity run by second generation members.

We used various methods of data collection for interpretation of the cases. We relied on transcribed interviews, covering a period of more than 10 years.

Case Vignette Alpha

The decision to enter: The founder's daughter, who is currently running the company, took a business administration degree at university. She chose that subject independently of her decision to join the family business; she just considered it to be a good opportunity for different jobs. She described the decision to enter not as a rational, conscious one: it just happened. After entering, she repeatedly moved from one office to another, without covering any specific role. After a couple of years she decided to leave the company. She wanted to prove what she was able to do out of her father's "shadow". She took an MBA and was hired

Table 3. Case Vignette

Case Vignette Alpha	Alpha operates in the home heating industry, producing boilers. Founded in 1970, its turnover is currently around 74 thousand Euros. Alpha is among the three leading Italian manufacturers of free-standing boilers [50,000 pieces per year], among the top ten in the wall-mounted boiler market [more than 80,000 pieces] and one of the leading five in radiators [1 million sections per year]. Moreover, the Group is one of the biggest manufacturers and suppliers of cast iron heat exchangers for the main European companies of the field. Alpha is now a group based upon three separate business units, which together constitute an integrated production system. The divisions are: production division for floor standing boilers; production division for wall-mounted boilers; foundry division; painting division services/warehouse; packing and shipment.
Case Vignette Beta	Beta is located in Northern Italy, within an area which is well known for men's sock manufacturing. The company was established in 1923 with the aim of producing men's and women's socks. Since its early days the company has been searching for new solutions in technology, materials and styles. The products are distributed all over Italy through retailers, wholesalers and a widespread distribution network of large customers. The company sells its products in various European and non-European countries. Its export rate has been growing thanks to extremely flexible marketing and production structures. The company's current turnover is 6 million Euros, which is not so bad in the industry, also taking into account the profound changes that have occurred in the company (which we describe). The founders had three children, two sisters (eldest and youngest children) and a brother (second born).
Case Vignette Gamma	The third case deals with the biggest Italian manufacturer of high-resistant bolts and one of the most important in the world. Founded in 1952 by two brothers, the company has followed its market's evolution, pursuing client satisfaction and cost reduction. Based on the firm's positive results and its international performance, the family wanted it to become a market leader and started an intense campaign to acquire companies in its field and to create new production sites.
Case Vignette Delta	The founders (husband and wife) established the company in 1961, with the aim of filling the local shortage in the supply of springs. After 16 years they were no longer considered craftsmen and moved the company headquarters. In the following years the company was organized into production centers, becoming more flexible to market demands. Project teams and just in time were implemented. The company prepared itself for the single European market and to supply large volumes for the automotive industry. The family includes father, mother, and five children, four of whom work in the company.

as a controller at IBM, where she attended an internal training course and had an interesting experience. She was appreciated for her work. Once she felt she had shown her own capabilities, she decided to go back and join the family business. She spent two years dealing with accounting and finance, although without any specific responsibility. The most important experience from those years was being close to her father all day long, watching him and his way of running the company, taking decisions and managing people and customers [LEADERSHIP EXPERIENCE]. She attended meetings with her father, listening to him and observing his way of building consensus, his charisma and his ability to gain people's trust. Sometimes she disagreed with some of his behaviors. She disliked the fact that he was not able to delegate his power and accept different ways of thinking. She spent another

couple of years in her father's shadow. When her father suddenly died, she had to take one of the most important decisions of her life: whether to continue or not. She did not have any doubt. The company was well established and had a great potential. This is how she describes her decision:

> I am a very stubborn person, very determined. Once I take a decision I stick to it. I knew it was hard, but I also knew it could be possible to go on. I was given a lot and had the opportunity – with the help of other people – to do something more.

Her sister was never interested in the business. She got married and moved away from Italy, living her own life, and buying and managing a shop.

The entrepreneurial activity: The founder's daughter realized the company needed to grow. In order to do that, she hired a managing director to help her, built a team of executives, and reorganized the company, creating a second strategic business unit. Originally the company's core business was a foundry producing iron for ground boilers. She decided to look for new customers for the foundry iron and at the same time created a brand, in order to strengthen the company's position in a very fragmented market.

Case Vignette Beta

The decision to enter: The two daughters followed similar entry-decision patterns. They both entered at the age of 21, while they were attending university. The elder daughter studied public relations, but never got a degree, while the younger got a degree in business administration, while working in the company. For both, the decision to enter depended on the company's specific needs in two areas. The elder joined the commercial area, while the younger joined the accounting area. During the first two years in the company the latter was mentored by a family friend, a very skilled business man, who spent every Saturday morning helping her build up competencies and knowledge, focusing both on the specific business and on the general administrative function. Documents that had been prepared by the mother over the years were very helpful to leam about the company and its past.

The entrepreneurial activity: in the nineties the parents planned to retire and let the children take over the company, which, at the time, was facing various problems due to different reasons. These included: a very difficult trading situation and, at the same time, a competitive environment requiring high flexibility; the need to refurbish the plants; the departure of an expert managing director; and the generational transition. These four elements led to the need for a complete strategic change. The younger sister, supported by her siblings and with the help of a consultant, completely changed the company structure reducing the number of employees from 100 to 25. The company started using subsuppliers and was able to become more flexible and efficient. It now has a stronger direct relationship with its employees and has created a small group with diversified activities. At the same time a brother entered the business. However, due to his attitude and personal traits, he preferred to leave and follow another career: he found it very difficult to follow rules and was described as a free spirit, in contrast with the situation that was being faced during that hard period of change.

The leading sister highlighted the following key success factors, which allowed her to face the difficult period:

> I think I have been taught to have a certain attitude, which was very helpful in facing such a difficult period. I have a passion for what I have been given, the humility to learn new things, the will to work, the ambition to build, and the constancy to reach the end Moreover, I have a very strong character, like all the members of my family, and this has supported me in difficult times There are also other factors that have helped me tackle difficult situations and develop good opportunities, such as a good team of people. The role of the leader is very important as is her/his ability to coordinate and motivate I think it is a matter of attitude, I like what I am doing. When we took the decision to go on we needed to do that, we had to, and no-one else could but us.

Case Vignette Gamma

The decision to enter: as mentioned above, three siblings joined the company. Once again the decision to join the family business was not a real choice, but the only thing they had always had in their minds. After finishing high school, the eldest brother was introduced into one of the wholesale operations the company had in Tuscany. There had been a flood in Florence and the business needed people. Today this brother is responsible for the commercial function of the group, which was previously the uncle's role. The second brother got a degree in engineering and then joined the business in the production area. The third brother studied business. Before graduating he had some work experience in finance in the UK, and afterwards he was sent for a couple of years to a commercial branch the group had in the US. His task was to develop the company locally. He then came back to Italy and joined the group, working alongside his uncle. He describes those two important experiences below.

> What I've learnt from living alone in the US is the ability to make decisions by myself. Of course now I run the business together with my brothers and we take decisions together. But I think that for an entrepreneur this ability is crucial. I had to learn it when I spent time overseas alone. I was also able to leam about the industry we are in and complete my competencies profile, since over there I had mainly commercial experiences.
> I have also learnt a lot with regards to the company's public life. But the main thing is the fact that by being in contact with other entrepreneurs I have realized there are many different ways to see the same thing. This opens your mind and is vital for an entrepreneur.

The training plan for all three brothers covered two levels of competencies, general and function-specific. As a team, they are able to complement their knowledge and experiences, but also share a common vision which allows them to recognize and seize opportunities.

> When the train goes by you have to take it. In order to be able to take it you have to be at the station. You are able to seize opportunities only if you have a vision, a plan.

The entrepreneurial activity: the main impulse the siblings gave to the group was in acquiring commercial and manufacturing companies, both domestically and abroad. Among all the opportunities they came across, they chose the ones that allowed the whole group to achieve strategic growth.

Case Vignette Delta

The decision to enter: the number of siblings in this case is five, four of whom are in the

company. Their entry decisions were different. The eldest child is not able to identify a precise moment in which he decided to enter. It was *natural* for him to start dealing with employees' wages, while he was still attending high school. He then decided to study business. While at university he spent more time in the company. During the last years of his studies there were some important changes in the company, which required teams to be dedicated to specific projects, such as cost control, production reorganization, and quality certification. He joined some of those teams, led by professionals who taught him real business lessons. After graduating he joined the company full time, choosing areas that were not covered by his father, such as organization. At the same time, his father had started delegating some of his power. The father was very product-oriented and only got involved in projects he particularly liked, while he delegated all other responsibilities to his children.

After learning from his father how to manage people, the eldest child built up his own team of collaborators. Something similar happened to the second brother, who was two years younger. He followed his father's path and also became product-oriented. He got a degree in engineering and then entered the company working in R&D. At the beginning he did not have a role of responsibility. He got that later once he had proved himself.

The third and fourth children are twin girls. They attended the same high school and then one got a degree in business and the other in foreign languages. The former entered the family business but for a very short period, after which she got married and had three children

The latter did not want to join the business, as she was not particularly interested in it, and preferred to work in the clothes industry. When the company started to go international, the father and the eldest child realized they needed someone who was able to speak foreign languages and had some managerial capabilities. This profile was very similar to that which the younger sister possessed. She was offered a position within the company and her family had to insist in order to convince her to join them.

The fifth child, a boy, had been interested in computers ever since he was very young and studied engineering. When he graduated, his father and eldest brother were implementing a SAP system in the company. They needed someone who could take care of the whole process and manage the people involved in it. They chose him. At the beginning he worked with his eldest brother but later all responsibilities were delegated to him.

The entrepreneurial activity: the most important change the company experienced was entenng the automotive industry as a direct and indirect supplier. That decision meant dealing with large volumes and included big changes in production and logistics. The family thought this jump was too difficult and risky for them. But the whole family agreed on the fact that, if they decided to seize the opportunity, this would allow them to supply important customers such as GM, offering them not only high quality products, but also new services related to planning.

These cases allowed us to identify a set of dimensions that helped us reach (at least partially) our goals, which were, to identify variables affecting entrepreneurial behavior and the criteria for the decision by family members to join the company; and to make a comparison with the results emerging from the quantitative survey. As mentioned before, the aim of adding the four cases to the exploratory study was to investigate the presence of further elements. In some cases the results of the quantitative and of the qualitative studies coincided.

However, we did not find evidence of the presence of venture capital, but this may have to do with the selection criteria we used to identify our cases.

We highlight the following key points:

a) *Decision to enter:* In most cases this decision was described as being the most natural thing. Very often both the children and the incumbents took for granted the continuity of the family business, sometimes due to the heirs' profound respect and admiration for the founder and his leadership capabilities. The strong relationship with the founder and the time spent in the company (which is very often close to their home) since their early childhood create in the founder's children a strong sense of belonging to the company, and this seems to influence the decision to enter. We identified the following factors:

- a sense of responsibility towards something that has been built from scratch;
- a state of need in the company, both in terms of strategic changes and of gaps in specific areas;
- an opportunity to be seized and the need for someone to do so;
- a personal interest and will to become an entrepreneur;
- a link between a sibling's attitude and will and an opportunity in the company.

This determinant also seems to work strongly in the opposite sense. If there is not a link (or a common area) between the heir's personal interests and what the company can offer, then the sibling prefers to get out of the business or not to enter at all;

- values, abilities and personal traits: these have allowed some heirs to join the business even in difficult situations. They include perseverance, being able to focus, wanting to work hard and accomplish one's goals, and self confidence;
- none of the interviewees mentioned a lack of alternatives as a reason to enter. This determinant may play some part in this, especially if the sibling is not particularly skilled or motivated.

These conditions may be present one at a time or simultaneously.

b) *Entrepreneurial behavior:* based on our interviews we have identified the following crucial elements:

- personal traits (which we called INDIVIDUAL CHARACTERISTICS in the previous section), such as self confidence, egocentrism, ambition, and stubbornness;
- capabilities related to leadership and managerial experience such as being able to: have a vision and see beyond day-to-day problems; imagine the final result and solve problems; take decisions; imagine different ways to see the same thing and create different solutions for the same problem; manage and motivate people; organize and be able to structure tasks and information;
- general management and specific industry knowledge, acquired at school and/or through working experience (mainly but not exclusively) in the company;
- the need for a team of collaborators, with complementary skills and trust, often differing from the ones created by the first generation entrepreneurs.

Therefore there seem to be a set of values, attitudes, knowledge, and capabilities (although the list above is not exhaustive), which help develop entrepreneurial behavior. There are also factors driving it, including:

- obtaining previous (work) experience which allow heirs to:
- develop their knowledge (of the company or industry);

- increase their ability to understand problems and find solutions;
- develop certain attitudes; and
- strengthen their character and self confidence.

This finding is coherent with the results of the exploratory research which showed the importance of work experience in terms of leadership and management (which are positively and significantly correlated with entrepreneurial orientation);

- mentoring by external or internal people;
- collaborating with and observing the incumbent;
- developing a network which may:
- provide help for particular problems;
- enable the development of an open mind attitude;
- increase the number of opportunities;
- help recognize and realize opportunities; and
- develop knowledge.

In conclusion, the four cases seem to confirm two results. The first is the crucial role of individual characteristics as "pre-conditions" for entrepreneurial behavior. They are the "raw material" on which an entrepreneurial personality can be built. The second relates to the successors' previous work experience. Interviewees confirmed the importance of developing managerial and leadership skills through work experience (while it was easier to achieve the necessary knowledge about the company and the industry through direct contact with the business).

11. CONCLUSIONS AND IMPLICATIONS

Given the crucial importance of entrepreneurial activities for a company's success (Lumpkin and Dess, 1996; Wiklund, 1999), understanding the factors that spur family members' willingness to engage in these activities becomes a worthwhile research question. By exploring individual, commitment-related antecedents of entrepreneurial behavior, results can be informative in highlighting which variables managers and consultants can influence to stimulate entrepreneurial behavior, hence enriching the contributions family firms make to the national economy.

Building on our results, further research may investigate the role that education, training and upbringing have in fostering determinants of successors' entrepreneurial behavior. In particular, it may be worth investigating the double role training can play. Having identified the content of young entrepreneurs' learning experience (e.g., values, attitudes, knowledge, and capabilities), it may be worth distinguishing between *general management education* (which includes leadership skills), which shows a strong impact on variables influencing siblings' entrepreneurial behavior, and *family-business based education,* which strongly influences siblings' decision to join the business.

Future research could investigate different levels of the determinants of entrepreneurial behavior, such as content and drivers. This will lead to defining a wider range of tools that might be useful to strengthen successors' competence. Attention should be devoted to understanding the extent to which outside experience and executive training are actually

tapped into and why. Results emerging from this stream of research will offer useful guidance to both families and institutions offering training programs.

In addition, research could focus on whether training paths enable successors to accumulate the appropriate competencies along different phases of the succession process. Successors in our study were not explicit in rationalizing their experiences. Hence, we still know little about the rationale behind the decision to join the business and about the processes through which they gradually develop functional and inter-functional knowledge, managerial capabilities, and managerial team membership.

Finally, some attention should be devoted to the training of inactive shareholders, i.e. family members who decide not to take an active role in the business. Professional practice shows that it may be dangerous to overlook their training as responsible owners, as resulting contrasts between active and inactive shareholders may severely impair company development.

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APPENDIX 1

COMPANY SIZE	
Approximately how many employees does the company have today, if we include owners working in the company? (full-time employees equivalents)	Total number of employees corresponding approximately to _____ full-time employees
COMPANY AGE	
Do you know in which year the company was founded?	Yes, ___ (4 digits); No
BOARD SIZE	
How many board members does the company have, except for possible union representatives?	___ board members
# EXTERNAL BOARD MEMBERS	
How many of these are external, that is persons who do not work in the company on a daily basis and do not belong to a predominant owner family?	___ board members
# BOARD DECISION-MAKING MEETINGS	
Approximately how many decision-making board meetings are held every year? (if >12, only meetings where minutes are written)	Appr. ___ meetings
MANAGERIAL BODY SIZE	
(if Yes) How many persons are members of the company's managerial body?	___ persons
% OWNED BY CEO'S HOUSEHOLD	
What % of shares is owned by... Yourself and other family members of your household?	___%
% OWNED BY CEO'S PARENTS	
What % of shares is owned by... Parents?	___%
% OWNED BY OTHER BOARD & MGMT MEMBERS	
What % of shares is owned by... Other individuals in the board and/or top management of the company?	___%
% OWNED BY INACTIVE INDIVIDUALS	
What % of shares is owned by... Other individuals who are not active in the management of the company?	___%
% OWNED BY INVESTMENT COMPANIES	
What % of shares is owned by... Investment companies?	___%
% OWNED BY VENTURE CAPITAL	
What % of shares is owned by... Venture capital?	___%
% OWNED BY OTHERS	
What % of shares is owned by... Others?	___%
MORE THAN 1 GENERATION ACTIVE	
Are family members (from the ownership family) from more than one generation active in the company or the business group?	No/Yes
CEO LEADERSHIP EXPERIENCE	
Before you became leader for this company, had you had any previous experience from management positions in other companies?	No, none; Yes, some; Yes, considerable
CEO EXPERIENCE SAME INDUSTRY	
Before you became leader for this company, had you had any previous experience from the same industry?	No, none; Yes, some; Yes, considerable
CEO EXPERIENCES OTHER INDUSTRIES	
Before you became leader for this company, had you had any previous experience from other industries?	No, none; Yes, some; Yes, considerable

DELEGATION AND INFORMALITY (ALPHA = 0,78)		
We prefer tight control of funds and operations by means of sophisticated control and information systems	1 - 10	We prefer loose, informal control. There is a dependence on informal relations
We strongly emphasize getting things done by following formal processes and procedures	1 - 10	We strongly emphasize getting things done even if this means disregarding formal procedure
We strongly emphasize holding to tried and true management principles and industry norms	1 - 10	We strongly emphasize adapting freely to changing circumstances without much concern for past practices
There is a strong influence on a uniform management style throughout the firm	1 - 10	Managers' operating styles are allowed to range freely from very formal to very informal
There is a strong emphasis on getting line and staff personnel to adhere closely to their formal job descriptions	1 - 10	There is a strong tendency to let the requirements of the situation and the personality of the individual dictate proper job behavior
VALUE-BASED COMPENSATION (ALPHA = 0,58)		
Our employees are evaluated and compensated based on their responsibilities	1 - 10	Our employees are evaluated and compensated based on the value they add to the firm
Our employees are usually rewarded by promotion and annual raises	1 - 10	We try to compensate our employees by devising ways so they can benefit from the increased value of the firm
An employee's standing is based on the amount of responsibility s/he has	1 - 10	An employee's standing is based on the value s/he adds
OPPORTUNITY-DRIVEN STRATEGY (ALPHA = 0,82)		
As we define our strategies, our major concern is how to best utilize the resources we control	1 - 10	As we define our strategies, we are driven by our perception of opportunity. We are not constrained by the resources at (or not at) hand
We limit the opportunities we pursue on the basis of our current resources	1 - 10	Our fundamental task is to pursue opportunities we perceive as valuable and then to acquire the resources to exploit them
The resources we have significantly influence our business strategies	1 - 10	Opportunities control our business strategies
GROWTH ORIENTATION (ALPHA = 0,71)		
It is generally known throughout the firm that growth is our top objective	1 - 10	Growth is not necessarily our top objective. Long term survival may be at least as important
It is generally known throughout the firm that our intention is to grow as big and as fast as possible	1 - 10	It is generally known throughout the firm that steady and sure growth is the best way to expand
RESOURCE CONTROL (ALPHA = 0,58)		
Since we do not need to have all resources available to commence the pursuit of an opportunity, our commitment of resources may be in stages	1 - 10	Since our objective is to use our resources, we will usually invest heavily and rapidly
All we need from resources is the ability to use them	1 - 10	We prefer to totally control and own the resources we use
We like to employ resources that we borrow or rent	1 - 10	We prefer to only use our own resources in our ventures
In exploiting opportunities, having the idea is more important than just having the money	1 - 10	In exploiting opportunities, access to money is more important than just having the idea
OPPORTUNITY SPOTTING (ALPHA = 0,68)		
We have many more promising ideas than we have time and the resources to pursue	1 - 10	We find it difficult to find a sufficient number of promising ideas to utilize all of our resources
Changes in the society-at-large often give us ideas for new products and services	1 - 10	Changes in the society-at-large seldom lead to commercially promising ideas for our firm
We never experience a lack of ideas that we can convert into profitable products/services	1 - 10	It is difficult for our firm to find ideas that can be converted into profitable products/services

Items for innovation, proactiveness and risk-taking followed a 7-point scale.

INNOVATION			
Generally our company prefers to	Strongly emphasize the marketing of the company's present products and services	1 - 7	Strongly emphasize R&D, technological leadership, and innovation
How many new lines of products or services has your company introduced over the past 5 years?	A lot of new lines of products or services	1 - 7	No new lines of products or services
	Changes in product or service lines have usually been quite dramatic	1 - 7	Changes in product or service lines have been mostly of a minor nature
PROACTIVENESS			
Our company's relation towards competitors.	Normally we react upon initiatives taken by our competitors	1 - 7	Normally we initiate changes upon which our competitors react
	Our company is seldom the first one to introduce new products or services, administrative systems, methods of production etc.	1 - 7	Our company is very often the first company to introduce new products or services, administrative systems, methods of production etc.
	Normally our company tries to avoid overt competition, but rather takes on a "live-and-let-live" posture	1 - 7	Normally our company takes on a very competitive oriented "undo-the-competitor" posture
RISK-TAKING			
Generally our company has	A strong tendency toward projects with low risk (with normal and certain rates of return)	1 - 7	A strong tendency toward getting involved in high risk projects (with chances of very high returns)
Generally we believe that	The business environment of the company is such that bold, wide-ranging acts are necessary to achieve the company's objectives	1 - 7	The business environment of the company is such that it is better to explore it carefully and gradually in order to achieve the company's objectives
When we are facing insecure decision making situations	We normally take up a bold, aggressive posture, in order to maximize the chance of being able to exploit possible opportunities	1 - 7	We normally take up a cautious "wait-and-see" posture in order to minimize the hazard of making costly erroneous decisions

THE EFFECTS OF ENTREPRENEURIAL POSTURE ON INTERNATIONAL ACTIVITIES IN THE LIGHT OF EMERGING GLOBALIZATION

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1. INTRODUCTION

Why are some firms getting involved in international activities? Can the corporate entrepreneurship literature help us explain a firm's international activities? Several theories exist about why and how a firm goes international (Hymer, 1976; Johansson and Vahlne, 1977; Knickerbocker, 1973; Porter, 1990; Vernon, 1966). In many theories there are assumptions that firms are risk averse, and that their reasons to go international are to reduce risk, or that firms progress from domestic to international markets in an orderly and risk-averse manner (Johansson and Vahlne, 1977; Knickerbocker, 1973). On the other hand corporate entrepreneurship, implying high levels of risk taking, proactive and innovative behavior, is increasingly considered the key to success in today's globally competitive markets (Allen, 1995; Drucker, 1985; Hitt, Hoskisson and Ireland, 1994; Pisano, 1990; Zahra and Garvis, 2001). Corporate entrepreneurship practices may in this respect offer important means to recognize and exploit foreign market opportunities in order to improve firm profitability and long-term performance (Guth and Ginsberg, 1990; Zahra, Neubaum and Huse, 2000).

In this paper we present two empirical studies of the relationships between entrepreneurial posture and international activities. The contribution of this paper is of interest for a variety of reasons. First, it links main concepts from the corporate entrepreneurship literature to a firm's international activities. This link has received limited attention in research despite the growing interest in the intersection between entrepreneurship and internationalization in recent years (e.g. McDougall and Oviatt, 2000; Zahra and George, 2002). A firm's international activities are complex, but in this study they are separated into two groups; on the one hand, exports and on the other hand, activities such as production and R&D in other countries. This paper, therefore, uses both the exports and international production dimensions to provide insights into the globalization of corporate entrepreneurship. Second, the paper explores effects of entrepreneurial posture and international activities in light of emerging globalization. Vernon's (1966) life cycle theory suggests that early in their life

cycle, most new products are produced and exported from the countries in which they were developed. As a new product becomes widely accepted internationally, production starts up in other countries. Vernon's theory used a U.S. perspective (Hill, 1994: p. 134) The rapid globalization of markets, as illuminated by the integration of Europe, makes it important to question earlier stated relationships. We will be able to study internationalization processes by using a Scandinavian perspective. Results from studies six years apart are compared. The time interval between the studies makes it possible to speculate about the effects of emerging globalization and integration of markets when entering the 21st century.

The rest of the paper proceeds as follow. The next section uses relevant theories and literature about corporate entrepreneurship and international activities to develop our perspective of this paper. The following section presents first the research model and hypotheses, and then the analytical methods, including description of the sample and the variables we employ.

Next we present the data analyses and results. The paper ends with a discussion section.

2. THEORY

2.1 Corporate entrepreneurship and entrepreneurial posture

Corporate entrepreneurship has received considerable attention during the last decade as a way to renew and revitalize firms (Barringer and Bluedorn, 1999; Covin and Slevin, 1991; Guth and Ginsberg, 1990; Jennings and Lumpkin, 1989; Lumpkin and Dess, 1996; Zahra, 1991, 1993, 1996). There are however various directions in the mainstream studies about corporate entrepreneurship as to what should be included in the definition of corporate entrepreneurship. Some scholars include mainly product or technological aspects of innovation in their definition, while others also include aspects of market innovation and venturing (Jennings and Lumpkin, 1989).

Entrepreneurial posture, or orientation, is a core concept in the corporate entrepreneurship literature (Covin and Slevin 1991; Zahra and Covin, 1995). Firms with an entrepreneurial posture are risk taking, innovative and proactive (Covin and Slevin, 1991). Entrepreneurial posture has been compared to what has been called strategy process, while venturing or new entries have been compared to what has been called strategy content (Lumpkin and Dess, 1996). Some authors also include strategic renewal as a part of corporate entrepreneurship (Guth and Ginsberg, 1990; Stopford and Baden-Fuller, 1994).

In this paper we will use Covin and Slevin's (1991) definition, and we will thus exclude strategic renewal as a separate variable from our discussion. Covin and Slevin describe firms having entrepreneurial posture as follows: "[T]op management is risk taking with regard to investment decisions and strategic actions in the face of uncertainty; the extensiveness and frequency of product innovation and the related tendency towards technological leadership; and the pioneering nature of the firm as evident in the firm's propensity to aggressively and proactively compete with industry rivals" (1991:10). Strategic renewal is thus part of Covin and Slevin's conceptual model of entrepreneurship as firm behavior.

2.2 International activities

The objective of this paper is to study how entrepreneurial posture aspects of corporate entrepreneurship influence a firm's international activities in light of emerging globalization.

The international activities of firms are complex and may range from exports to foreign direct investments (Hill, 1994; Ibeh, 2000; Johansson and Vahlne, 1977; Reynolds, 1997).

A firm's exports may vary with respect to intensity, indicating the relative importance of exports to sales or revenue, and scope, for example the number of countries to which the firm exports. While exports most often are goods and service produced domestically and then exported into other countries with various export efforts, firms may also to various degrees have productions, research and development, etc. located in other countries. The location of the labor force may also vary from all employees located domestically to almost everyone in other countries.

Hitt, Hoskisson and Ireland (1994) have developed what they call a mid-range theory of the interactive effects of international and product diversification on innovation and performance. In this theory two-way effects between international activities and innovation are suggested. In their model innovations will positively influence international activities, but innovations will also be positively influenced by a firm's international activities.

Industry is important in understanding the international activities and success of a firm. Porter (1990) studied why a nation achieves international success in a particular industry. Porter's thesis is that four broad attributes of a nation shape the environment in which a firm competes, and that these attributes promote the creation of competitive advantage (the diamond). He argues that firms are most likely to succeed in industries where factor endowments are the most favorable (Hill, 1994: p. 138). By factor endowments he means skilled labor, domestic demand conditions, relating or supporting industries, and firm's strategy, structure and rivalry. Industry variables should therefore be included in studies about international strategies and success.

Time may also be important to consider when investigating international activities. In the mid 1990's there was a major integration of national economies in Western Europe through the EU and the European Economic Agreement. In this paper we make comparisons between studies before and after this integration. A firm's international activities are divided into exports and international production, inclusive foreign location of labor force and R&D activities. Scandinavian firms are used in our samples. They are chosen to contrast U.S. samples as international activities and internationalization is supposed to be more important and ordinary for Scandinavian firms than U.S. firms. The Scandinavian countries are small and heavily dependent on international activities such as import and exports, and it is expected that their familiarity with international activities make international activities less entrepreneurial. By studying European firms we also expect that production in other European countries will be considered increasingly less entrepreneurial. The sample, thus, also enable us to study international activities in the light of emerging globalization.

3. MODEL AND HYPOTHESES

Our research model is described in hypotheses 1-7. The model is based on arguments from existing research on U.S. firms. The model is moreover based on a combination of independent and moderating effects. The focus of this study and our predicting variable is entrepreneurial posture. Two dependent international activities variables are used; exports and international production. Several control variables are used in our study, and they are expected to have both independent and moderating effects. Market venturing, industry, size and corporate governance are used as independent control variables (Bloodgood, Sapienza and Almeida, 1996; Sandberg and Hofer, 1987; Shrader, Oviatt and McDougall, 2000; Zahra and Garvis, 2000; Zahra, Neubaum and Huse, 1997). Industry and size are also used as moderating vanables together with time.

3.1 International activities and entrepreneurial posture

International activities are often characterized by considerable risk. Even though some main international business theories contend that internationalization is a reactive adaptation (Knickerbocker, 1973), we will argue that a firm's international activities are influenced by the firm's entrepreneurial posture. Knowledge and capabilities developed in the domestic market may in this respect not be suited in new geographic areas, and acting on foreign markets may hence require experimentation and risk taking in order to revise the firm's knowledge base to new situations (Hitt, Hoskisson and Kim, 1997; Ibeh, 2000; Lu and Beamish, 2001; Zahra, Marcel and O'Neill, 2001).

International production is however expected to be more entrepreneurial than exports. Internationalization as an aggressive, risk taking and innovative behavior will be most clearly displayed when firms in typical non-international industries get involved in international production. Most often a firm's international activities are expected to be based on some kind of internationally unique products or technologies. These associations are expected in regards to international production, R&D as well as exports. Furthermore, competitors in the international marketplace will outperform firms that fail to innovate (Hitt, Hoskisson and Ireland, 1994). Firms that neglect to investige in new products and processes will lose international market shares (Kogut, 1991). It can therefore be hypothesized that both exports and other international activities as production and R&D are positively influenced by a firm's entrepreneurial posture:

Hypothesis 1a) Entrepreneurial posture will be positively related to exports.

Hypothesis 1b) Entrepreneurial posture will be positively related to the firm's production, R&D and labor force in other countries.

3.2 Market venturing controls

Market venturing may be defined as entering new businesses by expanding operations in new markets (cf. Block and MacMillan, 1993). Exports may be a consequence of market venturing, and we hypothesize a general positive relation between market venturing and

international activities accordingly. However, domestic and international market venturing may be alternative or competing strategic directions for a firm. If the firm has possibilities to be involved in domestic market venturing, the firm may avoid the riskier option of international market venturing. If international and domestic market venturing were competing strategies, we would expect exports to be positively related to international market venturing and negatively related to domestic market venturing. We will therefore alternatively hypothesize a negative relationship between domestic market venturing and exports. On the other hand those firms penetrating the domestic market will also search for opportunities for less expensive production, etc., which might be found in other countries. We thus expect a positive relationship between domestic market venturing and production, R&D and labor force in other countries:

Hypothesis 2a) Market venturing will be positively related to international activities (both exports and production)

Hypothesis 2b) Domestic market venturing will be negatively related to exports.

Hypothesis 2c) Domestic market venturing will be positively related to the firm's production, R&D and labor force in other countries.

3.3 Firm size controls

Firm size has been considered to affect a firm's international activities (Manu, 1992). When firms are large and have more resources, the consequences of their commitment to international activities may be small (Johansson and Vahlne, 1977). Thus, firms with big surplus resources can be expected to make bigger international steps. While size in general is found to have a positive relationship with foreign direct investments, foreign production, foreign R&D, etc., the direction of the relationship between size and exports seems to vary in previous studies (Aaby and Slater, 1989; Bonnacorsi, 1992). We thus expect that it is mainly international involvement in production, R&D, etc. that will be positively related to company size. As we mainly will study established firms, we will, however, still hypothesize a positive relationship between firm size and exports:

Hypothesis 3a) Firm size will be positively related to exports.

Hypothesis 3b) Firm size will be positively related to the firm's production, R&D and labor force in other countries.

3.4 Industry controls

Theories of internationalization are often based on competitive advantage of industries. Exports are for example to a large extent expected to be determined by industry characteristics (Porter, 1990; Zahra, Neubaum and Huse, 1997). There are certain industries that traditionally are perceived as international or export industries. These firms in export industries are more likely to be exposed to opportunities internationally than firms in other industries. We therefore expect that there is a relationship between industry and export. We therefore

hypothesize relationships between industry and international activities.

Hypothesis 4a) International industries will be positively related to exports.

Hypothesis 4b) International industries will be positively related to international production, etc.

3.5 Corporate governance controls

The increasing roles of corporate governance and boards of directors have been highlighted during the 1990's (Finkelstein and Hambrick, 1996; Johnson, Daily and Ellstrand, 1996), and have also in earlier studies been found to be associated with a firm's degree of international activities (Sanders and Carpenter, 1998; Sherman, Kashlak and Joshi, 1998).

It has moreover been argued that corporate governance variables like board size (Daily et al, 2002; Judge and Zeithaml, 1992; Zahra and Pearce, 1989), board composition (Baysinger and Butler, 1985; Hunter, 1998; Parkinson, 1993; Sanders and Carpenter, 1998; Zahra, 1996) and ownership (Hill and Snell, 1988; Kosnik, 1987; Zahra, 1996) are important to understand the direction and performance of a firm. Arguments from the corporate governance literature lead to the following hypotheses.

There will be U-formed relationships between board size and a firm's international activities.

Hypothesis 5a) There will be negative relationships between small and large boards and exports

Hypothesis 5b) There will be negative relationships between small and large boards and international production.

There will be negative relationships between insider ratio and the existence of worker directors and a firm's international activities:

Hypothesis 6a) There will be negative relationships between insider ratio and increase in exports.

Hypothesis 6b) There will be negative relationships between insider ratio and increase in international production

Hypothesis 6c) There will be a negative relationship between the existence of worker directors and international production

There will be negative relationships between governmental ownership and managerial ownership and a firm's international activities

Hypothesis 7a) There will be a negative relationship between governmental ownership and international production.

Hypothesis 7b) There will be negative relationships between managerial ownership and exports.

Hypothesis 7c) There will be negative relationships between managerial ownership and international production.

4. METHODS

To meet the purpose and test the hypotheses of the paper, a study based on samples from two empirical surveys in Scandinavia was designed. The survey data were collected in 1993 and 1999. Both samples were taken from larger surveys containing more firms of either other sizes or other industries. The 1993 sample contained responses from 193 firms in Norway, while the 1999 sample contained responses from 409 firms in Sweden. The response rates in both surveys were just above 31 per cent. There were no differences with respect to size between the responding and non-responding firms. The response rate did, however, vary with industry. All firms were manufacturing companies with between 50 and 1000 employees. The samples are described in (Table 1).

Table 1. Descriptive statistics

THE 1993 SAMPLE	All companies (n=193)			International industries (N=68)			Non-it. industries (N=123)		
	Mean	Std. error	Std. dev.	Mean	Std. error	Std. dev.	Mean	Std. error	Std. dev.
Mean sales 1992 in mNOK[1]	313.0	27.8	384.9	293.3	40.0	330.2	323.7	36.9	412.6
Mean of emplovees 1992	209	13.6	189	245	26.5	218	190	15.1	169
THE 1999 SAMPLE	**All companies (n=409)**			**International industries (N=223)**			**Non-it. industries (N=186)**		
	Mean	Std. error	Std. dev.	Mean	Std. error	Std. dev.	Mean	Std. error	Std. dev.
Mean sales 1997 in mSEK[2]	272.1	17.4	351.5	282.4	27.6	412.3	259.7	19.2	261.2
Mean of emplovees 1997	186	8.2	166	189	11.5	172	183	11.7	159

[1]One U.S: dollar was in 1992 around 6 5 NOK
[2]One U S: dollar was in 1997 around 8.5 SEK

Even though Sweden and Norway have long lasting differences in their business cultures, they have more similarities than most other countries. Both Norway and Sweden have small domestic markets compared with the United States and countries in middle and southern Europe (Norway and Sweden have 4.5 and 8.9 million inhabitants respectively), and this situation has historically forced entrepreneurial Scandinavian firms to increase their international activities in order to grow and increase profits. The samples could hence be considered satisfactory with regards to the purpose of this paper. The use of samples from Scandinavia at the beginning and the end of the 1990's also has the advantage of introducing moderating effects on the relationship between entrepreneurial posture and international activities due to the integration of the Western European economic markets. Till 1993 neither Norway nor Sweden had been members of the European Union. From mid 1990's Sweden became a

member of EU and Norway a member of the European Economic Association (EEA).

Developments such as economic integration of Europe can be considered among the greatest challenges for international business in the 21st century.

Table 1 displays sales and number of employees in the two samples, and figures are also shown for firms in international vs. non-international industries. The mean number of employees in the 1993 sample is 209 persons, while the 1999 sample has a mean number of employees of 186 persons. Even though the numbers of employees in the two samples are almost the same, the relative sales in the 1993 sample are larger than the relative sales in the 1999 sample. The reason for this difference is a variation in sampling procedures in the two surveys. The amount of sales was the selection criterion in the 1993 survey, while number of employees was the selection criterion in 1999.

In each of the samples about one third of the firms had more than 200 employees. In the 1993 sample 128 firms had 50-199 employees and 65 firms had 200-1000 employees. In the 1999 sample 292 firms had 50-199 employees and 117 had 200-1000 employees.

Industries having SIC codes 341 pulp and paper, 35 chemicals, etc, 37 iron, steel ferroalloys, etc, and 38 engines, equipment, instruments were considered to be international.

This sorting was partly based on the empirical evidence from the 1999 survey. When comparing the two samples we find that firms in international industries in the 1999 sample are smaller than firms in the 1993 sample. The relative number of firms in international industries has, however, increased.

4.1 Variables

Entrepreneurial posture. The main variable in the study is entrepreneurial posture. Entrepreneurial posture was measured according to the definition of Covin and Slevin (1991), and includes a firm's risk taking behavior, aggressiveness and product innovation.

Risk taking behavior was measured with four items (Cronbach's alpha = .75 in 1993 and .80 in 1999), aggressiveness was measured with six items (alpha = .75 in 1993 and .62 in 1999), and product innovation was measured with five items (alpha = .80 in 1993 and .84 in 1999). A five-point Likert-type response scale was used. The wordings of the measures are found in an appendix. The 1993 survey used a Norwegian translation, while the 1999 survey used a Swedish translation. We constructed an entrepreneurial posture variable as the mean of the three elements. The correlation coefficients among them were between .34/.45 (in 1993/99) and .60/.55 (in 1993/99). The entrepreneurial posture variable was validated by comparing it with a corporate entrepreneurship variable used by Zahra (1991) consisting of nine items. The correlation coefficient between the Covin and Slevin variable and the Zahra variable was .45/. 51 (1993/99).

International activities. Two distinct variables of international activities were used: *exports* and *international production.* As international activities may be complex, we needed several indicators to design our variables. *Exports* were measured as the mean of four items; the natural log of the number of countries the firm exported to, the natural log of number of new countries the firm had been exporting to the last three years, the natural log of the percentage of sales that came from exports, and the natural log of the percentage of revenue that came from exports. The correlation coefficients among the various items were between .35/.25

and .97/.62 (in 1993/99). The other variable was constructed of three items; the natural log of the percentage of the labor force working in other countries, the natural log of the production activities taking place in other countries, and the natural log of the percentage of R&D activities taking place in other countries. The correlation coefficients among the three items were between .24/.26 and .81/.67. The correlation coefficient among the two variable measuring international activities was .51/.16. An increase in international activities was not measured, and we therefore used the measures presented above as indicators even when the hypotheses indicated that there should be and increase (see hypothesis 6).

Control variables. Several control variables were identified in the literature review, and they were expected to have both independent and moderating effects on a firm's international activities. *Market venturing* was measured as the mean of three items. These were involvement in entering new markets, segmenting the markets to locate new niches, and developing new domestic markets for the firm's products. A five-point Likert-type scale was used as the response scale. It was distinguished between internationally and domestic market venturing in the 1993 sample. This was not the case in the 1999 sample. *Firm size* was measured by the mean of the natural logarithm of the number of employees and the natural log of total sales. The natural log of employees and the natural log of sales had a correlation coefficient of .78 in the 1993 sample and .82 in the 1999 sample. The *corporate governance variables* were measured as follows: Board size was measured by two dichotomous dummy variables.

Small boards are boards with 1-4 members, and large boards are boards with 8 or more members. Insider ratio was measured by the number of board members being employees of the firm on the total number of board members. The existence of worker directors was measured as a dichotomous variable indicating whether there is one or more worker director.

The ratio of governmental ownership was .15 in 1993 and .02 in 1999, and the ratio of managerial ownership was .18 and .09. Differences in ownership structure may partly be due to differences between the two countries, as both family and governmental ownership have traditionally been higher in Sweden than in Norway. In order to meet the criteria of the standard regression equation, we transformed the ownership variables. In the analyses we thus used the square of the ratio of governmental ownership and the square of managerial ownership. These variables still did not quite meet the criteria for the standard equation. To control for this flaw we therefore also conducted control analyses with dichotomous dummy variables indicating the existence of managerial and governmental ownership. Only minor changes took place when using the dummy variables in the control analyses.Table 2 displays the results of the correlation analyses and the description of the variables in the two samples.

Results from the 1993 sample are in the bottom left hand corner, while the results from the 1999 sample are in the upper right hand corner. From table 2 we may identify the areas most vulnerable to colinearity in the regression analyses. One such area is among some of the corporate governance variables, but there also exist intercorrelations among the corporate entrepreneurship variables.

TABLE 2
Correlations, Means and Standard Deviations

1999 sample / 1993 sample	Exports	Intern. prod.	Comp. size	Intern. industries	Entr. posture	Market venturing	Dom. market venturing	Intern. market venturing	Small boards (1-4)	Large boards (8+)	Insider ratio	Exist.of Worker directors	Ratio of govern. ownership	Ratio of manag. ownership	*Mean*	*Std. Dev*
Exports	-	.17**	.19**	.30**	.30**	.42**	-	-	-.01	-.10*	.07	.02	.11*	.04	.91	.54
International	.41**	-	.31**	.13**	.15**	.19**	-	-	-.03	-.03	.01	-.00	.02	-.0	.06	.12
Company	.17*	.17**	-	-.01	.16**	.14**	-	-	-.21**	.18**	-.15**	.22**	.02	-.15**	8.50	.78
International	.57**	.21**	.08	-	.05	.06	-	-	.00	-.17**	.08	.04	.02	.03	.55	.50
Entr. posture	.27**	.29**	-.00	.27**	-	.46**	-	-	.02	.01	.03	-.09*	.04	.04	2.98	.65
Market	-	-	-	-	-	-	-	-	-.01	.05	.01	-.04	.06	.04	3.28	.82
Domestic market	.28**	.08	-.04	.09	.30**	-	-	-	-	-	-	-	-	-	-	-
Intern. market	.35**	.15*	-.02	.15**	.41**	-	.77**	-	-	-	-	-	-	-	-	-
Small boards (1-4	.13*	.01	-.19**	-.00	.04	-	.20**	.15*	-	-.23**	.05	-.53**	-.04	.05	.26	.44
Large boards (8+	-.05	.01	.37**	.02	-.01	-	-.10	-.07	-.18**	-	-.16**	.23**	.07	-.02	.13	.34
Insider ratio	.15*	-.04	-.14*	.12*	.02	-	.17**	.16*	.08	-.24**	-	.03	-.04	.19**	.47	.25
Existence of worker	-.05	-.01	.1**	.12*	.03	-	-.07	-.07	-.58**	.16*	.01	-	.07	-.15**	.58	.49
Ratio of govern.	-.24**	-.13*	.10	-.17*	-.30**	-	-.18**	-.21**	-.09	.23**	-.30**	.11	-	-.04	.02	.12
Ratio of managerial	.05	-.09	-.15*	-.01	-.01	-	.16*	.12*	.34**	-.21**	.55**	-.35**	-.18**	-	.07	.22
Mean	.70	.03	8.59	.35	2.98	-	2.68	2.95	.10	.21	.48	.87	.14	.15		
Std. Dev.	.61	.07	.81	.48	.59	-	.93	.94	.31	.41	.23	.34	.34	.32		

Pearson Correlation Coefficient 1-tailed T.sig. * < .05, ** <

1999 sample = plain text

1993 sample = **bold text**

The data analyses were conducted by multiple regressions. Two dependent variables were used: Exports (Table 3) and International Production (Table 4). To control for the moderating effects of time (country), size and industry, we made analyses of each of the a) full samples, b) various industry groups (international and non-international industries) and c) company size (50-199 employees and 200-1000 employees). To have some control of colinearity and to see the separate effects of various groups of variables, we entered the independent variables in steps. In step I we introduced firms size and international industry, in step II the corporate entrepreneurship variables, and an in step III the corporate governance variables. The tables report the adjusted Rsquares for each step. The adjusted Rsquares for the whole model are found in the third line (I-III) of adjusted Rsquares. Beta coefficients for the whole model are also presented in the tables.

Table 3. Results of regression analyses for exports

		Exports 1993					Exports 1999				
		All firms	Non-int.. industries	Int. indust.	50-199 employees	200-1000 employees	All firms	Non-int. industries	Int. indust.	50-199 employees	200-1000 employees
I	Firm size	.19**	.16	.26	.11	.09	.16**	.19**	.12	.10	.06
	International industries	.53**	-	-	.52**	.64**	.25**	.25**	-	.25**	.27**
II	Entrepremurial posture	.07	.04	.23	.01	.18	.11*	.11*	.20**	.11	.11
	Market venturing	-	-	-	-	-	.33**	.33**	.27**	.32**	.37**
	Domestic market venturing	.03	.11	-.24	.03	.02	-	-	-	-	-
	International market venturing	.16*	.25	.17	.20	.06	-	-	-	-	-
III	Small boar ds (1-4 members)	.05	.01	.24	.04	-.01	.01	.01	.02	.01	.04
	Large boards (8+members)	-.09	-.20*	.03	-.10	-.11	-.11*	-.22*	.07	-.07	-.17
	Insider ratio	.09	.03	.12	.08	-.00	.05	.02	.08	.05	.02
	Existence of worker directors	-.08	-.13	.01	-.01	-.41	.03	.01	.04	.00	.06
	Ratio of govern.ownership	-.07	-.03	-.25	-.11	-.03	.09*	.11	.06	.09	.12
	Ratio of managerial ownership	-.06	-.01	-.18	.05	-.29*	.03	.13	-.09	.03	.03
I	Adj. Rsquare	.36**	.00	.08*	.33**	.32**	.12**	.05**	.03**	.11**	.06**
I-II	Adj. Rsquare	.43**	.14**	.16**	.40**	.36**	.27**	.21**	.18**	.25**	.23**
I-III	Adj. Rsquare	.46**	.16**	.18*	.42**	.44**	.28**	.27**	.18**	.25**	.22**
	N	193	125	68	128	65	409	186	223	292	117

*The table reports partial standardized coeficients (Beta), adjusted R-square coeficients and significance level *p<.05, ** p<.01*

The full models for the total samples were all significant. The hypotheses are directly linked to each of the variables in the models. In short, hypotheses 1 and 2 about size and industry were supported, hypotheses 3 and 4 about corporate entrepreneurship were partly supported, and hypotheses 5, 6 and 7 about corporate governance were not supported. Entrepreneurial posture was positively related to exports in the 1999 sample, but was not significant in the 1993 sample. The hypothesis that entrepreneurial posture was positively related to international production was supported in the 1993 sample, but not in the 1999 sample.

Table 4. Results of regression analyses for international production

		International production 1993					International production 1999				
		All firms	Non-int. industries	Int. indust.	50-199 employees	200-1000 employees	All firms	Non-int. industries	Int. indust.	50-199 employees	200-1000 employees
I	Firm size	.19*	.20	.26	.04	-.01	.32**	.17*	.39**	.23**	.11
	International industries	.16*	-	-	.13	.20	.11*	-	-	.05	-.24*
II	Entrepremurial posture	.25**	.33**	.06	.18	.31*	.03	.04	.04	.09	-.01
	Market venturing	-	-	-	-	-	.12*	.16	.12	.07	.25*
	Domestic market venturing	-.07	-.16	.09*	.02	-.17	-	-	-	-	-
	International market venturing	.08	.00	.25	-.06	.22	-	-	-	-	-
III	Small boar ds (1-4 members)	.02	.06	.09	.07	-.13	-.02	-.03	-.03	.04	-.18
	Large boards (8+members)	-.06	-.14	.06	-.05	-.11	-.06	-.18*	.02	-.07	-.07
	Insider ratio	-.01	.14	-.20	.15	-.22	.04	-.08	.09	.00	.13
	Existence of worker directors	-.08	-.16	.15	-.07	-.27	-.07	.06	-.13	.00	-.26*
	Ratio of govern.ownership	-.05	-.01	.07	-.04	-.13	.02	-.07	.05	-.04	.07
	Ratio of managerial ownership	-.11	-.14	-.03	-.24	-.02	-.03	-.04	-.02	.03	-.13
I	Adj. Rsquare	.06**	.00	.04*	.01	.00	.11**	.04**	.14**	.05**	.06*
I-II	Adj. Rsquare	.12**	.09**	.11*	.02	.13*	.13**	.07**	.16**	.07**	.10**
I-III	Adj. Rsquare	.11**	.11**	.10	.00	.12	.12**	.06*	.15**	.06**	.13**
	N	193	125	68	128	65	409	186	223	292	117

*The table reports partial standardized coeficients (Beta), adjusted R-square coeficients and significance level *p<.05, ** p<.01*

As Regards Control Variables, market venturing was positively related to international activities in the 1999 sample (H2a supported). Domestic market venturing was negatively related, but insignificant to exports in the 1993 sample (H2b not supported), and domestic market venturing was positively related, but not significantly to international production in 1993 sample (H2c not supported).

All hypotheses on firm size and industry were supported (H3 and H4). Firm size was positively related to exports for all firms in both samples (H3a supported). Size was also positively related to international production for all firms in both samples (H3b supported).

International industry was positively related to exports for all firms in both samples (H4a supported). International industry was positive to international production for all firms in both samples (H4b supported).

No statistically significant relationships could be found when testing the hypotheses in the full samples, and the corporate governance variables (H5 - H7) were not supported.

Three sets of moderating variables were used to penetrate the results further: time (samples from 1993 vs. 1999), industry (international vs. non-international industries), and company size (50-199 employees vs. 200-1000 employees). The effects of the moderators on exports are found in table 3 and on international production in table 4.

The use of two samples, one from 1993 and one from 1999, should help us explore changes when the results are seen in the light of emerging globalization. When testing the hypotheses on each of the two samples we must bear in mind that the 1999 sample is more than twice as large as the 1993 sample. When we make comparisons, we do that based on the size of the standardized regression coefficients. There were no differences in the effects

of entrepreneurial posture in the two samples. The largest differences in the full samples in the exports table (Table 3) have to do with international industries, market venturing and ratio of governmental ownership.

The results indicate that what was an international industry in 1993, is not so clearly an international industry in 1999. Furthermore, in 1999 market venturing was significantly related to exports. In 1993 it was only international market venturing that was related to exports. The results indicate that governmental ownership is positively related to exports in 1999, but was negatively related in 1993. These findings must be interpreted with care, as most firms had no governmental ownership, which implies a considerable skewness in the variable. What may have happened in Scandinavia during these years was that a privatization, and remaining governmental ownership gave an impetus to exports.

Regressions for industry subgroups and size subgroups are found in table 3. Comparing industry subgroups in each of the samples, we find the following main differences: firm size, entrepreneurial posture, domestic market venturing and board size. The differences between the two industry groups are generally found in both samples. One exception is firm size on exports. The relative impact of firm size in international industries seems to be smaller in 1999 than in 1993 compared to non-international industries. These results must, however, be interpreted with care. Furthermore, entrepreneurial posture seems to have the largest impact on exports in international industries. Industry group seems to have an impact when understanding the impact of market venturing on exports. And when using industry group as a moderator we may explore effects of board size. Large boards are negatively related to exports in non-international industries, but no effects can be found between board size and exports in international industries.

When using firm size as a moderator to understand the effects of entrepreneurial posture on exports, few additional relations are found. However, there are indications in table 3 that the ratio of managerial ownership is negatively related to exports in the group of the largest firms in 1993, but not in 1999. The results displayed in table 4 also show that there is a negative relationship between the existence of worker directors and international production in the largest group of firms. These results support hypothesis 6c that worker directors will tend to keep domestic employment. Worker directors seem to play a different role in small firms than in the largest firms in the samples. This relationship is however only found in the 1999 sample.

The largest difference on the full sample equations is the effect of entrepreneurial posture on a firm's international activities in light of globalization within the framework of European integration. The hypothesized relationship is significant in the 1993 sample, but it is non-existent in the 1999 sample. When penetrating these results further, we find that this positive relationship is strongest in the largest firms in the non-international industries. What can these results imply? That it was a sign of entrepreneurial posture when firms in non-international industries were involved in international production in 1993, but that being involved in international production in 1999 no longer involved entrepreneurial behavior? Activities that used to demand aggressiveness, innovation and risk taking behavior may become more ordinary when Europe becomes integrated. International production and research and development seem to be such an activity.

6. DISCUSSION

This study has given various insights into the globalization of corporate entrepreneurship, and to corporate entrepreneurship research. We have linked concepts from corporate entrepreneurship to international activities. The concepts have been developed based on the U.S. literature and used in surveys conducted in Scandinavia. Findings in studies of U.S. firms are often directly used in the understanding of organizational behavior and firm strategies in other countries. Some of the concepts were clearly relevant also in Scandinavia, as indicated when comparing measures. But international comparisons may be difficult, and must be interpreted with caution. When using measurement instruments developed and validated in one country, these instruments may be directly translatable for use in another country.

The relationships between corporate entrepreneurship and a firm's international activities were studied in a Scandinavian setting by analyzing data from 1993 and 1999, thus paying attention to possible differences in cultural values and economic systems across borders (Boyacigiller and Adler, 1991). In this study of 193 Norwegian and 409 Swedish medium sized industrial firms (between 50 and 1000 employees), we found that entrepreneurial posture was positively related to a firm's international activities such as exports and international production, etc. This supports the assumption that corporate entrepreneurship practices can be related to an increase in a firm's international activities. In the most recent sample from 1999, we also found positive relations between market venturing and international activities, but the relationships between entrepreneurial posture and international production were weaker. This weak relationship may indicate that the effects of entrepreneurship on various activities may change over time. This should be in the nature of entrepreneurial posture as it is defined as aggressiveness, innovativeness and risk taking behavior. International production, international R&D and having a labor force in other countries supported innovation and risk taking behavior before markets were fully integrated, but as we enter the 21st century, such activities may no longer require an entrepreneurial posture.

By adapting a corporate entrepreneurship perspective on how a firm's international activities can be influenced, we have given some insights into how to compete in global and domestic markets. However, caution should be taken before generalizing the findings beyond the scope of this study. The results are derived from the study of Scandinavian firms and the findings may be specific to this setting. Future research attempts should be made to test and extend the generalizability of these results, and comparative samples of firms should be used. We moreover used a cross sectional design, and as indicated in the initial discussion, influences in both directions could be expected (Hitt, Hoskisson and Ireland, 1994). Causal designs should therefore have priority in future works. Previous studies have moreover indicated additional factors such as past performance, planning, technological sophistication, firm age, etc. that can influence exports and international activities. Such factors should be included in future studies of the relationships between corporate entrepreneurship and a firm's international activities.

Corporate entrepreneurship is a multifaceted concept. In this study we use an operationalization of the Covin and Slevin (1991) concept of entrepreneurial posture. Applying measures of various types and sources of innovation in relation to a firm's international activities would be a future challenge, as would be comparative studies of samples from countries outside Scandinavia. The most intriguing question will however be how international activities can

be successfully managed over time. The answer to this question will probably need to be addressed through longitudinal studies matching industry/environment and corporate entrepreneurship/strategy with criteria for business success.

7. CONCLUSION

This paper has contributed to research on entrepreneurship and internationalization by conducting a study of the impact of a firm's entrepreneurial posture on its international activities. The findings suggest that a firm's entrepreneurial posture may have positive effects on its international activities, but also indicate that international activities are not as entrepreneurial as it used to be as markets have become increasingly integrated and global.

Research and literature on internationalization predict an acceleration of international business activities in the 21st century as firms increasingly seem to pursue more active strategies that involve international activities (McDougall and Oviatt, 2000; OECD, 1997; Reynolds, 1997). The near future consequently provides rich opportunities for continued studies in the intersection between entrepreneurship and a firm's international activities.

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APPENDIX

Please indicate to what extent your company emphasizes the following areas (1 is very low, 5 is very high):

Risk taking behavior:

- Having high tolerance for high risk projects
- Taking bold, wide ranging competitive actions
- Supporting promising innovation projects that have uncertain outcomes
- Supporting experimental research and development projects

Aggressiveness:

- Spending heavily on promotional activities
- Spending heavily on advertising
- Being the first company in the industry to introduce new products to the market
- Being the first company in the industry to introduce new technology to the market
- Being the first company in the industry to adopt innovative technologies
- Challenging competitors rather than responding to their actions

Product innovation:

- Create radically new products
- Introducing radically new products to existing markets
- Offering enhancements or modifications to existing products
- Creating new products for speedy market introduction (in 1 to 2 years)
- Increasing revenue derived from products that did not exist 3 years ago.

Corporate entrepreneurship variable (Zahra, 1991):

- Creating an internal culture conducive to innovation
- Creating a unit within your existing structure for new business development
- Developing a committee or unit to encourage innovation in your company
- Creating an independent (autonomous) new venture unit in your company
- Developing a reward system for innovation
- Training the employees in creativity and innovation techniques
- Designating formal champions of innovative projects or ventures
- Revitalizing your company through innovation
- Capitalizing on unexpected opportunities created by changes in the market
- Capitalizing on unexpected opportunities created by changes in competitors' strategies

The mean of 9 and 10 was used as one item. The wordings of the last two items divert somewhat from the items used by Zahra (1991).

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BEYOND PIONEERS AND FOLLOWERS: A TYPOLOGY OF ENTREPRENEURIAL BEHAVIORS FOR HOSTILE ENVIRONMENTS

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1. INTRODUCTION

Entrepreneurship literature considers environment's role a crucial elements for understanding entrepreneurial success (Low and MacMillan,1988; Schoonhoven and Romanelli, 2001).

Drawing upon the different streams of research that have identified sources of effectiveness in entrepreneurial behaviors, this paper aims at highlighting effective entrepreneurial behaviors for hostile environment, considering as effective entrepreneurial behaviors those that grant firm survival in such an environment (Gartner, Starr and Baht, 1999). This research on effective entrepreneurial behaviors for hostile environments is conducted on a two step-approach. The first step regards the identification of the sources of effectiveness of entrepreneurial action, conducted via an accurate review of extant literature. On the basis of this review, the second step concerns a research design on firms striving to survive in hostile environment. The research question deals with the identification of effective entrepreneurial behaviors for hostile environment.

The chapter is organized as follows. The next section deals with entrepreneurial effectiveness, entrepreneurial behaviors and hostile environment. Then, entrepreneurship literature is reviewed in order to identify sources of entrepreneurial behavior effectiveness.

Subsequently, research design and methods are described. This is followed by results presentation, and discussion of main implications stemming from results. The final section highlights directions for extending research on effective entrepreneurial behaviors in hostile environments.

2. IDENTIFYING EFFECTIVE ENTREPRENEURIAL BEHAVIOR AND LINKING IT TO HOSTILE ENVIRONMENT

2.1 The 'Effectiveness Issue' in Entrepreneurship Research

It could be difficult to understand why, in similar conditions, some organizations exit, while others continue their business (Gimeno, Folta, Cooper and Woo, 1997), unless it is taken into account that effective entrepreneurship (and, then, lasting organizations) entails the integration of entrepreneurial context and process (Low and MacMillan, 1988). Since

entrepreneurs do not constitute a homogeneous entity, nor entrepreneurship is a single action event, insights stemming from literature, while providing useful prescriptions may lack of an empirical support as regards actual entrepreneurial effectiveness in hostile environments.

In essence, what may require further clarification is the comprehension of entrepreneurial effectiveness in a hostile environment. This may call for the development of an integrative framework, which may lead to understand, in a non-reductionist way, what entrepreneurial behaviors can be considered effective especially for hostile environments. Such a purpose may be reached, for example, observing pattern of behaviors in a survivor firms sample, drawn from a hostile environment from either a theory-driven perspective (Borch, Huse and Senneseth, 1999), or from a broader literature review-based approach (Amit, Glosten and Mueller, 1993).

The latter approach is chosen, that relying on a literature review, in order to understand how certain entrepreneurial actions lead to firm survival in a hostile environment. Then, the many roots of entrepreneurial effectiveness, as posed by extant literature, have been identified; and a research having as unit of analysis survived firms situated in hostile environment has been, eventually, conducted. This approach may offer new insights on how entrepreneurs strive to survive in such an environment, the meanwhile avoiding any reductionist approaches, whether in dychotomic (i.e., pioneers vs followers - Covin and Slevin, 1999) or in classificatory form (Lumpkin and Dess, 1996).

2.2 Hostile Environment and Entrepreneurial Behavior

Entrepreneurship is a context-specific phenomenon (Schoonhoven and Romanelli, 2001).

In this perspective, the environment constitutes an important factor affecting management processes from, at least, two different perspectives: industrial competitive dynamics (Porter, 1980; 1985) and institutional (North, 1990; 1993b). Though, the concept of hostile environment as tough industry competitive conditions not always proved to be consistent with the presence of a low rate of survival among start-ups and established entrepreneurial firms (Stinchcombe, 1965). Romanelli has empirically showed that competitive conditions (measured through change in market demand and competitive concentration) are unrelated to the mortality of young firm (1989:pp.385).

The institutional perspective, on the other hand, represents a broader level of analysis for entrepreneurship-related issues (Gerschenkron, 1966; Lipset, 1988), since the institutional environment creates and provides the context wherein entrepreneurial processes are carried out. North (1990) has observed that institutions are the rule of the game that each country sets for economic competition. History suggests that countries characterized by stronger enforcement rules on property rights and lower transaction costs constitute benign environment for business processes (North, 1990). These countries, in fact, allow for more efficient exchanges among organizations, thus representing munificent environments compared to those countries, which, instead, suffer from higher transaction costs and lower enforcement on property rights. Besides, Putnam (1993) has empirically showed that institutions in southern Italy perform worse than those in central and northern Italy, because of a lack of civic-ness due to historical reasons. These contributions highlight a compelling argument: those environments characterized by higher levels of transaction costs — due to a lack of

social capital, trust and civic-ness — constitute hostile contexts for business and, consequently, for entrepreneurship.

Therefore, in this paper the concept of environmental conditions is addressed in the broader perspective of the institutional environment, assuming this as the context where entrepreneurial efforts, behaviors and performances take place.

2.3 Identifying the roots of effective entrepreneurial behaviors

Drawing from studies and contributions on entrepreneurial action effectiveness the purpose of this research effort is to obtain a detailed list of variables referred to the entrepreneurship research domain. Hence, in order to identify the source of effective entrepreneurial behaviors through a non-reductionist approach, a review of the main streams of research in the entrepreneurship field of research has been carried out (Table 1). The purpose of this review is to identify the many attributes of entrepreneurial behavior from different theoretical perspectives.

Entrepreneurship as firm behavior. Scholars in this perspective highlighted the nexus of relationship among three streams of research (the what, why, and how issues in entrepreneurship literature), in order to identify the source of entrepreneurial effectiveness amongst the strategic management choices; the organizational characteristics; and the internal and the external factors (Covin and Slevin, 1989; Stevenson and Jarillo, 1990).

Networking and relational capabilities. This stream of research is focused on the entrepreneur's capability to access to external resources through the leverage of his/her social and relational network (Jarillo, 1990; Starr and MacMillan, 1990; Dubini and Aldrich, 1991).

New Venture Survival (1): *threshold of performance perspective.* This perspective draws attention to the issue of new ventures' performance comparison. New ventures in the same context with equal economic performance may behave differently with regard to either exit or continue their business according to: threshold of performance; human capital and personal economic factors; switching and opportunity costs (Gimeno, Folta, Cooper and Woo, 1997).

New Venture Survival (2): *liability of newness and population ecology.* Scholars in this stream of research highlighted the importance for start-ups of understanding environmental conditions and adapting competitive strategies and management behavior to these conditions (Stinchcombe, 1965; Romanelli, 1989).

Austrian Theories. This perspective is focused mainly on opportunity exploration and identification as core entrepreneurial capabilities. Austrian economists argued that economic equilibrium approaches to market analysis does not comprehend adequately the role of individuals, since individuals have information and knowledge that create idiosyncratic resources. This is the origin of a disequilibrium on markets, which, in turn, provides opportunities for achieving equilibrium through human economic action. Entrepreneurship, hence, has its origin in a disequilibrium context (Kirzner, 1973; Shane, 2000).

Innovation Theories. Schumpeter (1936) is the most influent scholar in this perspective. His contribution highlighted the importance of individuals in pursuing innovation (through new goods and services, new processes, new source of raw materials, re-organization of an industry). Further contributions in this perspective argued that innovation may be extended to technological transfer and timing in new product launch (Baumol, 1993).

Psychological Theories. Scholars in this stream of research argue that personal psychological characteristics and attributes are the main factors accounting for the decision to exploit an entrepreneurial opportunity. They assume, therefore, that such characteristics and attributes are stable in some individuals and not in others. The more entrepreneurs will show them, the more it will be likely they will exploit identified entrepreneurial opportunities (McClelland, 1961; Begley and Boyd, 1987; Busenitz and Barney, 1997).

Neoclassical Equilibrium Theories. This perspective highlights the perfect distribution of knowledge and information. Since transactions are carried out without misalignments, no one can discover opportunities. Therefore the source of entrepreneurial behavior has to be identified in the proclivity of individuals for uncertainty bearing and risk propensity (Khilstrom and Laffont, 1979).

Corporate entrepreneurship / intrapreneurship. Scholars in this stream of research shed lights on those characteristics that allow the development of entrepreneurship in an established company. These characteristics may concern tolerance of ambiguity, strategic management competencies, organizational structure (Brazeal, 1993).

Entrepreneurship as marketing orientation. This perspective emphasizes marketing competencies as determinants of effective entrepreneurial behaviors. More precisely, scholars in this stream of research highlight the importance of information and knowledge concerning market dynamics and customer needs (Morris and Paul, 1987).

Opportunity cost. This stream of research assumes that the lower the opportunity cost individuals will bear in a given context, the more likely they are to undertake entrepreneurial activity. Scholars adopting this perspective, therefore, hypothesized a correlation between low opportunity costs and the decision to become entrepreneur (Amit, Muller, and Cockburn, 1995).

External financial support / Venture capitalist role. Scholars in this perspective highlights the importance of venture capitalists in the development of entrepreneurial activity, emphasizing the crucial role of VC, besides financial support, in reducing information asymmetry and adopting effective strategic choice (Amit, Brander and Zott, 1998; Cable and Shane, 1997).

Entrepreneurial Orientation / Entrepreneurial Posture. This perspective draws attention to a bundle of individual and firm attributes characterizing the entrepreneurial activity. Studies in this stream of research stressed the importance of innovation, personal characteristics, and marketing and strategic management choices (Morris and Paul, 1987; Covin and Slevin, 1989; Lumpkin and Dess, 1996).

Risk taking propensity. Scholars adopting this perspective emphasize the proclivity to take risks as the main determinant of the decision to become an entrepreneur. Risk taking propensity,

therefore, is the main variable to take into account in order to understand how entrepreneur value business scenario and opportunities (Brockhaus, 1980; Palich and Bagby, 1995).

Real Options. This perspective draws attention to the importance of forward reasoning about the outcome of entrepreneurial activity. Since failure is a damage from both the social and the economic point of view, it is argued that a real options reasoning helps identifying those investments whose conditions and performance are favorable (McGrath, 1999).

Table 1 summarizes the content of the review. The first column reports the stream of research; the second column highlights authors and researchers in each perspective; the third column identifies the attributes of entrepreneurial behavior in each perspective.

Table 1. Streams of research within the entrepreneurship field and attributes of entrepreneurial behavior

Theoretical perspective /Stream of research	Author/s	Entrepreneurial behavior attributes
Entrepreneurship as firm behavior	Covin and Slevin (1991); Stevenson and Jarillo (1991)	External resources, Strategic management choices, organizational characteristics
Networking and relational capabilities	Jarillo (1990); Starr and Mac Millan (1990); Dubini and Aldrich (1991)	Social networks; external resources
New Venture survival: Threshold of performance perspective	Gimeno, Folta, Cooper and Woo (1997)	Awareness of threshold of performance and human capital, employment opportunities, switching and opportunity costs.
New Venture survival: Liability of newness and population ecology	Stinchcombe (1965); Romanelli (1989)	Awareness of liability of newness, capability of tailoring competitive strategies to environmental conditions
Austrian theories	Kirzner (1973; 1979); Shane (2000)	Opportunity recognition and exploitation
Innovation theories	Schumpeter (1936); Baumol (1993)	Innovation
Psychological theories	Mc Clelland (1961); Begley and Boyd (1987); Busenitz and Barney (1997)	Entrepreneur's psychological characteristics
Neoclassical equilibrium theories	Khilstrom and Laffont (1997)	Personal characteristics, risk taking propensity
Corporate entrepreneurship / intrapreneurship	Brazeal (1993)	Management competencies, strategic management choices; organizational characteristics
Entrepreneurship as marketing orientation	Morris and Paul (1987)	Market knowledge; customer knowledge;
Opportunity cost	Amit, Muller and Cockburn (1995)	Opportunity cost
External financial support / VC role	Amit, Brander and Zott (1998); Cable and Shane (1997)	External financial support / venture capitalists' role
Entrepreneurial orientation / Entrepreneurial posture	Morris and Paul (1987); Lumpkin and Dess (1996); Covin and Slevin (1989)	Innovation; personal characteristics; strategic management choices;
Real Options	McGrath (1999)	Real options reasoning
Risk taking propensity	Brockhaus (1980); Palich and Bagby (1995)	Risk taking propensity

The different perspectives highlighted in Table 1 have eventually been grouped on the basis of their research purposes. The goal is to identify a scale of items that aims to cover the broad spectrum of research interests in the entrepreneurship field of research in a hostile environment (De Vellis, 1991). Table 2 summarizes this effort. More precisely, column 1 reports the groups

of streams of research, while column 2 lists the array of entrepreneurial effectiveness items emerged from the review. The general purpose of the review is to identify a scale of item referring to effective entrepreneurial behaviors, in order to eventually conduct an exploratory factor analysis (Kim and Muller, 1978). The final goal of the exploratory factor analysis is to develop a scale by means of which assessing how much each item has been important for firm's survival (De Vellis, 1991)

Table 2. Items selected for exploratory factor analysis

Streams of Research	Items
Personal characteristics / risk propensity / neoclassical equilibrium theories / entrepreneurial orientation and posture	entrepreneur's proactiveness; personal goal achievement; entrepreneur's autocracy; entrepreneur's autonomy; entrepreneur's risk propensity; entrepreneur's values; entrepreneur's creativity; entrepreneur's education; entrepreneur's need of self-employment
Internal factors / Intrapreneurship / General management/ strategic management /opportunity costs valuation theories	organizational organicness; organizational culture; venture profitability; threshold of firm performance clearly known; law regulations; organizational innovation; personal financial funds; delegation of authority; opportunity cost valuations
Networking and external resource access theories	access to R&D consortia; role of venture capitalist; access to skilled HR; relationships with brokers; relationship with suppliers; inter-firm cooperation deals; inter-firm resource sharing deals; relationship with universities; access to other's technology; access to financial support; belonging to a local population of firm; access to trade consortia
Marketing orientation approach	market and customer knowledge; price advantage; distribution related advantage
Schumpeterian and Austrian theories; Real Options	product or process innovation; geographic, info, and time advantage on selling markets; geographic, info, and time advantage on selling markets purchasing market; introduction of a new business; new source of raw materials; reorganization of industry; entrepreneur's previous job related to the venture; real options reasoning

3. METHODS

Research design consisted of two phases. In phase 1 an Exploratory Factor Analysis has been performed as research method, for it refers to statistical techniques whose objective is to represent a set of variables in term of a smaller number of hypothetical factors (Alwin, 1973; Mulaik, 1972). while keeping the number of factors and covariance structure fixed (Kim and Mueller, 1978). The purpose of the exploratory factor analysis was to highlight a pattern of entrepreneurial behaviors, emerging from firms survived in a hostile environment.

Phase 2 consisted of a Confirmatory Factor Analysis, in order to test the goodness of fit of the typology emerged from phase 1. To perform this test, it has been chosen the structural equation modeling method (LISREL 8.5 - Jöreskog and Sörbom, 1996). The two most popular ways of evaluating model fit are those involving chi-squared statistics and the so-called goodness-of-fit indexes that supplement the chi-squared test (Hu and Bentler, 1995). Growing dissatisfaction with the chi-squared test has led to the generation of adjunct fit indexes (Hoyle, 1995), which are used as test of model adequacy. Adjunct fit indexes vary

between zero and 1.0, 0.90 is widely accepted as a value such indexes must exceed before a model can be viewed as consistent with the observed data from which it was estimated. Goodness-of-fit indexes treated in this paper are CFI (Comparative Fit Index), GFI (Goodness of Fit Index) and AGFI (Adjusted Goodness of fit Index) provided by LISREL (LISREL 8.5 - Jöreskog and Sörbom, 1996). CFI is a an Incremental FIT Index, while GFI and AGFI are Absolute Fit Indexes (Hu and Bentler, 1995). The former measures the proportionate improvement in fit by comparing a target model with a more restricted baseline model. The latter directly assess how well an *a priori* model reproduces the sample data. The use of different types of adjunct fit indexes is recommended (Hoyle, 1995).

The sample in this research has been drawn through a judgement sampling procedure, a type of sampling used in order to select a sample to meet specific criteria (Emory and Cooper, 1991; Dess, Lumpkin and Covin, 1997). Firms selected had to meet four specific criteria: revenues bigger than 500.000 euro; older than 6 years; employing more than one employee and being located in Calabria. Two further points will be addressed with respect to company age and geographic location. Researchers use to consider firms 6 years and younger as new ventures (Zahra, Ireland and Hitt, 2000). Likewise, Bantel (1998) has observed that firms failing the achievement of a sustained market position by the age of 5 have rapidly become extinct.

Dun and Bradstreet database selected 307 manufacturing and service firms meeting these criteria in Calabria. Questionnaires were sent to all 307 firms. Respondents were 213 (response rate of 69.3%). A *t-test* comparison of the average number of employees, annual sales revenue and age of responding firms with the same data for nonresponding firms revealed no difference between these two groups, thus the sample appears to be representative of the population from which it was drawn. According to Dess *et al.* (1997), the entrepreneurial behavior as strategy making can be affected by organizational size and industry type. Though, I assume that size does not affect entrepreneurial behavior, since the same entrepreneurial behavior can be showed whether by small or large firms. Likewise, in so far as industry type is concerned (manufacturing or services), it is argued that industry does not affect entrepreneurial behavior, since both a manufacturing and a service firms are supposed to be able to assume the same entrepreneurial behavior.

In so far as the measurement of environment hostility is concerned it is assumed a first level of analysis at the country level. Therefore, a country profile-index as a measure of munificence has been chosen in order to assess a country's munificence (Busenitz, Gòmez, and Spencer, 2000). More precisely, I chose the Fraser Institute Index of Economic Freedom, especially the Economic Freedom Index for Europe, since I pose that the performance of a country, with respect to Economic Freedom, represents an appropriate measure of environmental economic munificence (or hostility). The Economic Freedom Index considers seven parameters, each subdivided in sub-parameters. Seven parameters are: size of government; economic structure and use of markets; monetary policy and price stability; freedom to use alternative currencies; legal structure and security of private ownership; freedom to trade with foreigners; freedom of exchange in capital markets. From the institutional perspective, according to Economic Freedom Index, Italy is a hostile environment for business (Italy ranks 14th among EU15 Economic Freedom Rating and 31st in the Global Economic Freedom Rating); besides, environmental hostility assessment has been deepened to the regional level, in order to

identify a more homogeneous context from the institutional perspective. The region chosen for this research purpose is Calabria. Calabria showed the lowest levels of civicness in Putnam's research (1993). Recent surveys, though conducted following a different approach compared to Putnam's research, confirmed Calabria's extreme institutional hostility (Censis, 2002).

The questionnaire asked entrepreneurs to answer each question on a 7-point Likert scale.

Conducting subjective measurement of firm survival based on entrepreneurs' perception is consistent with prior research in the field of entrepreneurship (Dess, Lumpkin and Covin, 1997; Covin, Slevin and Heeley, 1999). Moreover, prior research has indicated that subjective measures can be consistent with objective measures, thus enhancing reliability and validity (Dess and Robinson, 1984). The typical question was: 'To what extent the following variable has helped your firm's survival?'. Responses ranged from 1 'not at all important', to 7 'extremely important'.

4. RESULTS

An Exploratory Factor Analysis (Varimax Rotation Method; Maximun Likelihood factor extraction method – Alwin, 1973) has been performed on the 40 items scale reported in Table 2. Underperforming items (i.e.: factor loading < .40 on at least one factor – De Vellis, 1991) have been eventually discarded, and the final list of items consisted of 16 items. These items performed adequately on at least one factor (factor loading > .40). A second Factor Analysis has been performed on these 16 items. >From this analysis a four factors structure clearly emerged. Table 3 reports the descriptive statistics for the 16 items, while Table 4 and 5 reports the results of the Exploratory Factor Analysis.

Four significant factors emerged from the factor analysis according to the Kaiser criterion (eigenvalue >1 - Table 4). All variables had significant factor loadings on at least one of the four factors (i.e. > 0.40), thus performing better than the rule of thumb considering factor loadings less than .30 as not substantial (Kim and Mueller, 1978). Furthermore, Kaiser's MSA (measure of sample adequacy), which measures the extent to which variables are appropriate for factor analysis was 0.709, indicating a satisfactory level, since 0.8 is considered meritorious and 0.9 marvelous. Yet, the 16-item scale (Table 3) highlighted room for improvement, since two items *(Relationship with brokers*; and *Proactiveness)* showed croass-loadings. Therefore, it has been shortened to 14 items (Table 5). The shortened scale showed the best fit, meeting or exceeding the .90 threshold on a wide range of goodness-of-fit measures: chi-squared = 102.25 (67 df); goodness of fit index (GFI = .94); adjusted goodness- of-fit index (AGFI = .90); comparative fit index (CFI = .95).

The interpretation of factor loadings highlights a typology of entrepreneurial behaviors (Tables 4 and 5). The first factor includes variables such as: 'Access to R&D consortia (V15); 'Access to other's technology' (V13); 'Marketing and customer knowledge' (V16) 'Access to skilled human resources' (V14). Though less intuitive, this behavior seems to recall a business conduct far from innovative and risk oriented; rather it seems to show a proclivity toward the imitation of other firms' behavior. Therefore it is defined *imitative behavior.*

The second factor includes variables such as: 'Inter-firm co-operation deals' (V10);

*Table 3. Descriptive statistics and correlations**

Variables (N=213)*	Mean	S.D.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1 - Innovation (new product and process development)	3,95	2,63	-														
2 - Personal goal achievement	3,38	2,23	0,41*	-													
3 - Distribution related advantages	3,42	2,11	0,14*	0,26**	-												
4 - Entrepreneur's risk propensity	2,14	1,63	0,30**	0,40**	0,13*	-											
5 - Geo., Time and Info. Adv. in selling markets	4,69	2,05	0,05†	0,15*	0,30**	0,07†	-										
6 - Geo., Time and Info. Adv. in purchasing markets	3,79	1,98	0,11†	0,28**	0,51**	0,14*	0,54**	-									
7 - Proactiveness	4,11	2,21	0,17*	0,50**	0,31**	0,16*	0,35**	0,33*	-								
8 - Relationship with brokers	3,79	2,08	0,11†	0,32**	0,21**	0,11†	0,25**	0,37**	0,46**	-							
9 - Relationship with suppliers	2,49	1,89	0,10†	0,09†	0,20**	0,13*	0,03†	0,13*	0,18**	0,39**	-						
10- Inter-firm cooperation deals	1,87	1,45	0,03†	0,22**	0,13*	0,05†	0,06†	0,07†	0,28**	0,27**	0,38**	-					
11- Access to financial support	1,51	1,19	0,06†	0,21**	0,14*	0,04†	0,14*	0,16*	0,28**	0,28**	0,43**	0,47**	-				
12- Access to trade consortia	2,27	1,83	0,13†	0,32**	0,23**	0,12†	0,14*	0,20**	0,36**	0,43**	0,35**	0,49**	0,49**	-	-		
13- Access to other's technology	4,05	2,13	-0,07†	0,01†	0,05†	0,00†	0,10†	0,09†	0,12†	0,03†	-0,15*	0,16*	0,03†	0,00†	-		
14- Access to skilled HR	5,47	1,81	0,09†	0,16*	0,06†	0,04†	0,16*	0,06†	0,18**	0,16*	-0,25**	-0,03†	-0,16*	0,00†	0,39**		
15- Access to R&D consortia	4,36	2,07	-0,15*	-0,01†	0,09†	-0,08†	0,03†	-0,08†	0,11†	0,02†	-0,13*	-0,14*	-0,09†	-0,29**	0,31**	0,41**	
16- Marketing and Customer Knowledge	4,24	2,14	-0,10†	0,05†	0,04†	-0,12†	-0,12†	-0,13*	0,15*	0,02†	-0,07†	0,06†	-0,02†	-0,11†	0,44**	0,29**	0,63**

** $p < 01$,
* $p < 05$,
† $p < 1$.

Table 4. Results of explorative factor analysis

	Initial			Non rotated pattern			Rotated pattern		
Common Factor	Total	% Var.	% Cumul.	Total	% Var.	% Cumul.	Total	% Var.	% Cumul.
Relational	3,75	23,45	23,45	3,19	19,92	19,92	2,19	13,72	13,72
Imitative	2,46	15,37	38,82	1,92	12,01	31,93	1,89	11,83	25,55
Arbitraging	1,71	10,68	49,50	1,16	7,23	39,16	1,75	10,93	36,48
Self-referential	1,40	8,77	58,26	1,02	6,37	45,53	1,45	9,04	45,53
5	0,98	6,13	64,40						
6									
:									
:									
15	0,86	5,37	69,77						
16	0,24	1,50	100,00						

Table 5 Factor loadings of 14 items Entrepreneurial Typology

Item	Imitative 1	Relational 2	Arbitraging 3	Self-referential 4
16.Market and customer knowledge	,835			
15.Access to R&D consortia	,736			
13.Access to other's technology	,472			
14.Access to skilled HR	,411			
10.Inter-firm cooperation deals		,682		
12.Access to Trade Consortia		637		
11.Access to Financial support		,616		
9.Relationship with suppliers		,531		
6. Geographic, Time and Information advantages related to purchasing markets			,713	
5.Geographic, Time and Information advantages related to selling markets			,699	
3.Distribution related advantages			,521	
2.Personal goal achievement				,810
12.Innovation (new product and process development)				,611
4.Entrepreneur's risk propensity				,415

'Access to financial support' (V11); 'Access to trade consortia' (V12); 'Relationships with parts and components suppliers' (V9). These variables seem to identify a behavior oriented toward cooperation and relationship development. Therefore, it is defined relational behavior.

The third factor suggests the orientation towards the exploitation of emerging opportunities in both purchasing and selling markets, via advantages in distribution. Variables with high significant loading resulted: 'Geographic, Time and Information advantages related to purchasing markets' (V6); 'Geographic, Time and Information advantages related to selling markets'(V5); and 'Distribution related advantages'(V3). These variables may indicate an orientation towards a behavior that can be conceived of as arbitraging-oriented. Thus, this behavior is defined *arbitraging.*

The fourth factor includes variables such as: 'Innovation through new product and process development' (V1); 'Personal goal achievement'(V2); and 'Entrepreneur's risk propensity' (V4). This behavior results from a synthesis of both schumpeterian and personal characteristics of the entrepreneur. Therefore, in order to emphasize both innovation and personal features it is defined *self-referential behavior.*

The four factors respect an important criterion, because each of them report an eigenvalue greater than 1.0 (Kim and Mueller, 1978). The factor structure is also consistent with the constraints posed by the more conservative factor analysis researchers (Iacobucci, 1994), who state that best estimates for factor loadings are obtained when p (the number of variables) is 3 or 4 times r (the number of factors). The typology has been eventually tested in order to ascertain industry effects. With the exception of some negligible differences in factor loadings, the emerged typology resulted confirmed in six industrial clusters identified within the sample.

Summarizing, in terms of explained variance, effective entrepreneurial behavior in hostile environment seems to be more a matter of relational and imitative capabilities than a question of arbitraging and self-relational behavior, as, instead, a large body of past and present studies claims. This, in turn, opens up new intriguing research perspectives, linking, for example, entrepreneurship to social capital and networking capabilities in local geographic context.

5. DISCUSSION

The goal of this paper was to investigate what can be considered as an effective entrepreneurial behavior in a hostile environment. Research findings allowed for the identification of an entrepreneurship typology, resembling the important strands in this field of research and offering an original mind-set on entrepreneurial behavior in a hostile environment.

With respect to the first type, relational behavior — a business conduct characterized by a proclivity to relationships with other institutions in the environment, with the purpose of cooperation, risk sharing, and shared access to resources and markets — it can be argued that under difficult environmental conditions these capabilities enhance firm's performance and/or its likelihood of survival. These goals may be pursued through social relationships, by means of which obtaining access to resources at a lower cost, and accessing to networks of information and competence (Starr and MacMillan, 1990), (Jarillo, 1989) has argued that networking practices are a way to overcome problems related to resource that a firm needs but does not

control and that the ability to exploit resources that are outside the entrepreneur's control is a constant of entrepreneurial management; finally, (Lorenzoni and Ornat,1988), in a study conducted in the textile manufacturing area of Prato (Italy), empirically show that small firms fail to grow over certain thresholds and relate on a network of collaborations (named constellation), in order to capture resources. Relational behavior may result effective for hostile environments mainly because of its capability in overcoming market and institutions inefficiency, being these problems affecting not only underdeveloped economies, yet even East-European countries that only recently have reached democracy, and regions within Southern Europe countries. Both contexts present low market efficiency, and their institutional performances seldom create entrepreneur's satisfaction.

As regards the second type, imitative behavior, it has to be observed that this entrepreneurial posture is not simply a replication strategy of extant technology; rather, it entails marketing competence, human resource management and, to some extent, absorptive capabilities (Cohen and Levinthal, 1990). An imitative entrepreneurial conduct may prove effective in hostile environment. Covin et al. (1999) have shown that in hostile environments followers perform better than pioneers as far as purchasing capabilities and access to advanced process technology are concerned. Imitation represents, more than innovation, a viable entrepreneurial behavior under specific conditions. Especially in mature markets and in advanced industry life cycle stages, conservative (i.e., risk-averse) strategic postures have resulted a more effective behavior for new ventures (Covin and Slevin, 1990), (Besides and Teece, 1987) has observed that innovation not always leads to competitive advantage and rent appropriation. For these to occur, in fact, it is required the exploitation of complementary assets which, if not held, may eventually cause rapid dissipation of rents. Thus, firms holding complementary assets can profit from innovation carried out by firms not holding such assets, just imitating the underlying technology. Hence, in hostile environment, imitative behavior has to be considered as an effective entrepreneurial behavior since it grants survival and better performances to firms that adopt it.

In so far as the third type is concerned, arbitraging behavior, it has to be noticed that this behavior regards a business conduct characterized by alertness in opportunity exploitation (Kirzner, 1973), mainly due to advantages related to purchasing and selling markets, (Shane and Venkataraman, 2000) observe that entrepreneur's 'information corridors' and 'cognitive properties' allow for search, identification and exploitation of opportunities. Yet, getting useful information about competitors and industry dynamics is not a widespread capability.

In fact, (Baumol, 1993) observes that firms use patents, secrecy and other means to prevent diffusion of ideas and information. Hence, those who succeed in getting high-value information before competitors can exploit this advantage in several ways. Arbitraging capabilities may result relevant in hostile environment, because they allow for opportunity identification and exploitation, thus anticipating competitors either in market entry or in resource acquisition. Since hostile environments are characterized by low market and institutional efficiency, acquiring first-mover advantages in such a context may increase firm's performance and its survival likelihood.

Finally, the fourth type, self-referential behavior, refers to a business conduct charactenzed by an autonomous and autocratic personal orientation, shaped by personal goal achievement, innovativeness and risk propensity. The concepts of independence, autonomy and autocracy

refer to the endogenous and self-referential spirit of individuals in pursuing a goal, (Lieberman and Montgomery, 1988) highlighted the endogenous nature of first-mover opportunities (a mix of proficiency and luck), even though entrepreneurs often perceive great opportunities that ultimately prove disappointing. The final outcome of venturing notwithstanding, a self-referential behavior may result effective even for hostile environment, since it represents a viable way for overcoming market inefficiency and poor institutional performance, given the strong need for achievement characterizing this behavior. Besides, pursuing innovation in hostile environments, even when this may result in a failing experience, may constitute a learning opportunities for the entrepreneurs and his/her employees. Considering the high risk propensity of such an entrepreneurial posture, learning from failure in hostile environments may lead, eventually, to better performance in future venturing opportunities.

A limitation for this study was the methodology used, since the empirical test of hypotheses were based on data from a field study. This may result in unknown sample bias, which may cause some limitations on the reliability and generalizability of findings. The sampling methodology, judgemental sampling (Emory and Cooper, 1991); (Dess, Lumpkin and Covin, 1997), can also constitute a source of limitations for reliability, since the sample was selected for the purpose of hypotheses testing in hostile environment.

The identification of a typology of entrepreneurial behavior rooted in the field of study of entrepreneurship opens up further research issues. These issues can be drawn from each of the types identified by the typology emerged from the research, and can be further explored with respect to, at least, two important settings: industry characteristics (life cycle stage; competitive pressure; concentration) and institutional-economic environment characteristics (benign *vs.* hostile). Thus, it should be very interesting to assess whether industries in different stages of their life cycle and characterized by different levels in competition, show different patterns of entrepreneurial behavior or confirm the typology proposed in this paper. Moreover, in a more restrictive sense, it should be intriguing to measure whether the pattern of common factors emerged in this research is confirmed. Another issue to address should be represented by the impact of a benign environment on the construct pattern, in order to control whether in a non-hostile environment the proposed typology presents a similar pattern in factor loadings.

6. CONCLUSION

Attempting at the identification of an entrepreneurship typology, on the basis of an exploratory factor analysis performed on a 40-item list covering the main streams of research on entrepreneurship may constitute an effort consistent, on the one hand, with what requested in the most recent contribution on entrepreneurship (Shane and Venkataraman, 2000). On the other hand, the identification of a typology of entrepreneurial behavior suggests new research questions. Whit respect to this point, for example, the importance of a relational entrepreneurial behavior in a hostile environment compared to that of the innovation-oriented behavior (self-referential), thus raising a puzzling question whether social capital (Venkataraman, 1997) can enhance entrepreneurial performance. Scholars in the sociology field (Swedberg, 2000) observed, in fact, that the entrepreneurship phenomenon has an

important root in the social sciences. Still, to date, little attention has been posed to the impact of social capital on entrepreneurship; with the exception of those scholars (Anderson and Jack, 2002); (Baron and Markman, 2000) whose studies provided insightful evidence of the nexus between institutional environment, interorganizational relationships and entrepreneurship. Hopefully, the development of the theorizing process with respect to the effectiveness of entrepreneurial behavior contingently with the environmental conditions will help entrepreneurs to accomplish both at the societal and economic level their responsibility.

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LEARNING IN ENTREPRENEURIAL FIRMS: AN EXPLORATORY STUDY

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1. INTRODUCTION

Research on learning processes in entrepreneurial firms is still at an early stage (Agndal, 1999; Minniti and Bygrave, 2001). Past studies of entrepreneurial cognition tend to focus on issues such as risk taking (e.g. Brockhaus, 1980; Begley and Boyd, 1987; Brockhaus and Horowitz, 1986) or opportunity recognition (e.g. Palich and Bagby, 1995; Shane, 2000), whereas the learning processes that occur as entrepreneurs accumulate and organize knowledge and information within (e.g. Van de Ven and Polley, 1992; McGrath, 1995) and across development efforts (Minniti and Bygrave, 2001) are still underexplored phenomena.

Learning is intrinsic to entrepreneurial action. In cognitive terms, entrepreneurial innovation can be conceived as a process of building and refining a set of knowledge structures – technologies, routines, interpretations, etc. — that expand and transform an initial intuition into a viable new product or service, a new production process or a new way to serve the market. The central argument of this chapter is that learning in entrepreneurial firms can fruitfully be conceived as a collective process involving a variety of internal and external contributors.

An established stream of literature contends that the development of entrepreneurial ideas requires contributions of a different nature from a range of actors, whose knowledge and skills are complementary to the entrepreneurs' (Aldrich and Zimmer, 1986; Birley, 1985; Larson, 1991). Industrial and research partners, suppliers, clients, consultants, and venture capitalists offer contributions that often go beyond the physical content of the exchange: they contribute to the development and refinement of the technologies embodied in new products and services, and of the organizations that produce and deliver them. In this chapter, building on findings from a multiple case study, we discuss factors that affect the

capacity of entrepreneurs to effectively integrate external contributions and to retain most of the knowledge generated in the process.

2. ENTREPRENEURIAL INNOVATION AS GENERATIVE LEARNING

In a recent theoretical contribution, commenting on Kirzner's (1973) insightful observation that the purposeful search for information that follows the discovery of an opportunity is central to entrepreneurial activity, Bygrave and Minniti conclude that "entrepreneurship is a process of learning, and a theory of entrepreneurship requires a theory of learning (Minniti and Bygrave, 2001, p. 7)". Nevertheless, with some exceptions (e.g. Bailey, 1986; Guth, Kumaraswamy and McErlean, 1991) researchers in the field of entrepreneurship have devoted little attention to studying learning processes in entrepreneurial action.

Traditionally, research on the psychology of entrepreneurs focused on the cognitive traits — such as risk propensity, need for achievement, and self-confidence — that differentiate entrepreneurs from non-entrepreneurs (e.g. Begley and Boyd, 1987; Brockhaus, 1980; McClelland, 1961; Shaver and Scott, 1991; Forlani and Mullins, 2000). Empirical studies aimed at demonstrating the peculiarity of entrepreneurs' psychological traits, however, seem to have failed, so far, to produce conclusive results (Brockhaus and Horowitz, 1986; Low and MacMillan, 1988). More recently, a number of studies shifted attention to the cognitive processes and mechanisms according to which entrepreneurs select and process information, to make sense of the external environment (Palich and Bagby, 1995; Busenitz and Barney, 1997; Baron, 1998; Nicholls-Nixon, Cooper and Woo, 2000; Shane and Venkataraman, 2000; Shane, 2000). A distinctive feature of most of these studies is the assumption that what makes entrepreneurs different is either a set of psychological traits or the way they collect, select and process information (Bailey, 1986; Agndal, 1999; Minniti and Bygrave, 2001). In this chapter, instead, we shift the focus of our attention from the cognitive processes to the contextual conditions that affect the learning process that underlies entrepreneurial innovation, as entrepreneurs move from an initial intuition to a well-developed new product or service. This is what we refer to in this chapter as "entrepreneurial learning". We acknowledge that other important learning processes occur, for instance, as entrepreneurs learn "how to be entrepreneurial" (Minniti and Bygrave, 2001) or as they start exploiting their innovations, managing growth and building an organization. However, we believe that the specific type of learning that underlies and sustains the development of a new way of connecting resources, technologies and needs in a value-generating way is a distinctive feature of entrepreneurship.

Entrepreneurial innovation is about discovering and exploiting opportunities for new valuable combinations of resources that lead to the introduction of new products or services, new production processes or new ways to serve the market (Schumpeter, 1934). Learning in an entrepreneurial venture, therefore, resembles more what has been termed higher-level, generative learning, as opposed to lower level, adaptive learning (Fiol and Lyles, 1985; Miner and Mezias, 1996). Adaptive learning involves the development of behavioral routines that allow an organization to perform a repetitive task in an increasingly efficient and effective way (e.g. Cyert and March, 1963; Nelson and Winter, 1982). Indeed, a balanced combination of generative and adaptive learning is required to support long-term growth, as the exploitation of commercially successful new ideas provides the resources to support new exploration

(Mintzberg and Waters, 1982). However, the exploration of new combinations of resources is a qualifying feature of entrepreneurial action. Learning in an entrepreneurial venture has a creative component that goes beyond repetition and incremental optimization; it occurs in ambiguous contexts and often involves the development of completely new solutions or radically innovative products. Successful entrepreneurial innovation requires an increasing understanding of contexts of use and functional implications of alternative solutions. As we understand it, entrepreneurial learning takes place as entrepreneurs gradually manage to make sense of the connections between the different technical subsystems, product functions, customers' preferences, market structure, etc., and reduce the degree of ambiguity associated to the external environment (Weick, 1995).

3. STUDYING ENTREPRENEURIAL LEARNING AS A COLLECTIVE PROCESS

Our research was based on a longitudinal study of technological innovation in six entrepreneurial firms. The adoption of a rich, qualitative method for data collection and analysis was justified by the exploratory nature of the study (Yin, 1989; Lee, 1998) and by the characteristics of the phenomenon, i.e. learning, which requires a methodology that can trace processes as they unfold over time and is sensitive to the broader context and the perspective of the involved actors (Miles and Huberman, 1994; Miner and Mezias, 1996; Lee, 1999).

Early evidence gathered during our research led us to conclude that a thorough study of the learning processes in entrepreneurial firms should include a detailed analysis of their support networks — whose contribution is often crucial for the effectiveness of the learning process. Although in entrepreneurial firms a single person — i.e. the entrepreneur — often plays a pivotal role in the development process, he or she rarely possesses all the competencies required for the success of the venture. It has been observed that the possibility to access and make use of resources that are not currently controlled is a critical component of the entrepreneurial process (Stevenson and Jarillo, 1990), and that entrepreneurial success depends on the capacity of the entrepreneur to overcome the limits posed by the available resources (Stevenson and Gumpert, 1985). As far as knowledge resources are concerned, entrepreneurs typically possess a good knowledge of the market and the customers, and/or a certain degree of technical competence in their field. This background knowledge allows entrepreneurs to interpret new information as an entrepreneurial opportunity, leading to the generation of potentially valuable business ideas (Shane, 2000). The actual realization of these ideas, however, often requires not only financial resources, but also skills and competencies that must be obtained from industrial, commercial and research partners, consultants, designers, etc. (Dubini and Aldrich, 1991; Larson, 1991). Indeed, in the observed cases, the range of actors involved in the innovation processes extended from the entrepreneurs — locus of coordination and impulse for the projects — and their close collaborators inside the company (technicians, engineers, marketing people, etc.) to a web of external partners, consultants and suppliers, who provided specific knowledge and competencies to the project. Entrepreneurial learning, therefore, seemed to arise from the interaction of a number of actors that were, in part, external to the organization.

The collective nature of learning in entrepreneurial firms influenced our subsequent methodological choices. For each case we followed the patterns of interaction between the

company and the external partners, as relationships were built and evolved and contributions were acquired and integrated along the process. This method helped us capture the complexity of the innovation process as it unfolded from the initial idea to the final version, emphasizing the role that external partners played in each step.

All the analyzed cases were small and medium, privately owned companies. Table 1 summarizes general information about the cases. Given the exploratory nature of our study, we considered heterogeneity as a way of increasing variation in the data, in order to grasp the complexity of the phenomenon better and to develop a more robust conceptual framework (Miles and Huberman, 1984). Following Andrew Pettigrew's principle of "planned opportunism", we chose firms that combined ease of access and high visibility of the research topic (Pettigrew, 1990). According to a criterion widely used in the literature, all six cases can be defined as "entrepreneurial firms", since they are systematically engaged in development processes that lead to the design of new products or production processes (Carland, Boulton and Carland, 1984) and rely extensively on external resources and contributions (Stevenson and Gumpert, 1985).

We relied on different sources for data collection. Preliminary secondary research (press interviews, web sites, etc.) helped us to collect background information on the companies.

Then, for each company, data were collected through semi-structured interviews with core internal and external contributors to each project (see Table 1). Each case study followed a standard protocol (Yin, 1989). The first interview with the main contact person, usually the entrepreneur or one of the partners, was aimed at enriching our background information, identifying a suitable object of analysis for our research, and identifying the actors involved in the process and the nature of their involvement. We asked our informants to identify a recent case of innovation and to indicate staff members that were highly involved in the process and that had a substantial interaction with external parties. These persons were then contacted for a second round of interviews, aimed at collecting a more detailed description of the process. In some cases, we also had the opportunity to interview external contributors whose interaction with the company was particularly intense. All the interviews followed a common structure. We adopted an open-end format in order to collect both factual data and personal impressions. Our informants were first asked to reconstruct the story of the project as they lived it, trying to distinguish facts (how it started, who was involved, etc.) from personal observations. During the interviews, we encouraged our informants to specifically refer to facts and events that left a trace in their memory. To ensure reliability, at least two members of the research team were present at all the interviews. All the interviews were taped and transcribed. If information collected at a later stage required further probing or clarification of minor discrepancies, some informants were interviewed more than once.

Multiple interviews helped us to reconstruct a "story" of each process. Although our reconstruction was based on informants' recall, combining multiple perspectives helped us to move beyond individual perceptual biases and minimized potential recall problems.

For data analysis we used common methods for grounded theory building (Glaser and Strauss, 1967; Miles and Huberman, 1984) and combined within-case analysis with cross-case comparison. Within-case analysis, based on rich — at times anecdotal — information, led to insights that were further developed and tested in cross-case analysis. We began our analysis with a detailed reconstruction of the chronology of the process. We then tried to highlight events or decisions that marked an advance or a change of direction in the

Table1. Summary of Companies in Study

Company	Size (employees)	Activity	Observed innovation	Informants and no. of Interviews
Futureplast	9	R&D (lighting industry)	New production process (laser system for glass manufacturing) New product (plastic cable for light conduction)	Owner, 2 Owner, 2 Internal scientist, 1 External supplier, 1 External engineer, 1
Microalgae	2	R&D (biotechnology)	New production process (industrial-scale photobioreactor for the production of micro seaweed)	Owner, 2 Internal manager, 1 Internal manager, 1 Internal technician, 1 Internal technician, 1
Parma	130	Safety boxes	New product (cash-in cash-out safety box)	Owner, 1 Head of technology department, 2 Internal software developer, 1 External engineer, 1
Polti	600	Small home appliances	New product (vacuum cleaner with water-based filter)	Owner, 1 Marketing manager, 2 Marketing manager, 1 Head of design unit, 1 External designer, 1
Serigrafica Tosi	65	Rolls for silk-screen printing	New production process (roll-print technology)	Owner, 3 Internal engineer, 1 Internal technician, 1 External consultant, 1
Petroltecnica	60	Tank-cleaning services for oil companies	New product (robot to clean oil tanks)	Owner, 2 Owner, 2 Project manager, 2 Internal manager, 2 External engineer, 1

development projects. The identification of critical events was based on content analysis of the interviews. Our goal at this stage was to identify key themes emerging from cases.

Following indications from Eisenhardt (1989), we referred to the existing literature on innovation and knowledge management to develop and enrich these inductively derived insights. Provisional interpretations and tentative propositions were refined in several iterations between theory and data until we were able, for each case, to provide a plausible explanation of the observed patterns. In a second stage, in order to verify how strongly each theme contributed to the explanation of the general phenomenon, we conducted a cross-case comparison. In some cases, the comparison required a further homogenization of concepts, as some themes were grouped into a more general concept. As it often happens in inductive research, these findings in part confirm and in part extend past literature. Again, the process followed an iterative path, until the emerging conceptual framework fit the observed patterns across cases. In the following sections we report and discuss the main findings of our study, using representative instances from the observed cases to support and illustrate our arguments. More extensive presentations and discussions of our findings are reported in Marchisio and Ravasi (2001) and Ravasi and Turati (2003).

4. MANAGING THE LEARNING CONTEXT

Given the collective nature of entrepreneurial innovation, a critical requirement for successful innovation is the active management of a web of relationships in order to identify and select appropriate sources of competencies and skills. In the six observed cases, the identification of the potential contributors followed two main routes At first, when confronted with a task to be carried out by an external partner, most entrepreneurs tended to rely on existing relationships and started by searching through their personal network. For instance, Mr. Tosi, owner of Serigrafica Tosi, a producer of screens for silk-screen printing, turned to a machine shop that had worked for him before. Parma, a producer of safety devices for the banking industry, consulted the managing director of a commercial partner. Polti, a medium-sized producer of small home appliances, relied on established relationships with external laboratories and suppliers of components. In this respect, we could talk of a process of *network activation,* as latent relationships were accessed and external contributors were harnessed along the specific project. This first option seems to have at least two important benefits. First, relying on the personal network helped reduce the time and costs associated with the search and selection of partners. Second, this process of network activation helped overcome the problem of assessing the potential quality of the contribution, because often the required competencies belonged to a scientific or professional domain of which the entrepreneur had little knowledge or experience. As a manager from Parma put it: “It’s difficult to assess and control competencies that you do not have (…) that’s why it is important to know your partners in advance”.

If the personal network did not offer any suitable solution, the observed entrepreneurs started a *rational search,* based on the analytical comparison of potential suppliers of a specific product or service. Data about existing alternatives were gathered extensively. A restricted range of potential partners was selected and contacted. The nature of the project and the content of the contribution were discussed and further information was gathered,

until one of the potential partners was selected. Although this process seemed to be more time consuming, it was also more comprehensive. Indeed, one of the pitfalls of network activation seemed to be that entrepreneurs relied on established relationships regardless of their actual competence or appropriateness to the current project. In this respect, a rational search brought under consideration a broader selection of potential partners. Entrepreneurs had to find some criteria for comparing and selecting alternative partners. Selecting the most competent or reputed one, however, did not always prove to be an effective strategy.

In general, our analysis highlighted three factors that consistently influenced the effectiveness of the identification and selection of external partners across cases: (i) the presence of boundary-spanning roles; (ii) the alignment of interests of all the actors; and (iii) the geographical proximity of the critical actors.

4.1 Boundary-spanning roles

As we have mentioned, entrepreneurs do not always possess the knowledge and skills required to identify suitable candidates, nor to perform an appropriate selection. In these cases, we observed a tendency to rely on boundary-spanning roles that helped entrepreneurs reduce the uncertainty associated with the decision. This, for instance, was the reason why, as the complexity of the development activities carried out at Futureplast — a small company engaged in research and development for the lighting industry — increased, co-owner Mr. Guzzoletti decided to hire a skilled physicist who could help him in contacting and screening external partners. As Mr. Guzzoletti put it:

> The employment of a person with a solid scientific background was meant to provide structure and method to the research activity carried out at Futureplast, and to open up new channels towards the external acquisition of new, front-line scientific knowledge.

Boundary-spanning roles could also be found among the entrepreneurs' personal networks.

In the cases of Microalgae, Parma and Petroltecnica, for instance, the projects required the contribution of technical and professional skills of which the entrepreneurs had no previous experience. In all these cases, the selection and identification of appropriate contributors was essentially delegated to third parties – members of the personal network of the entrepreneur that were involved in the project not only for their personal skills, but also for their connections with other networks belonging to different technical and professional domains. As Parma decided to diversify from simple safety boxes to more complex cash dispensers, for instance, the first move was to involve in the project Mr. Spinetti, a former commercial partner with years of experience in running companies in the cash dispenser industry. Mr. Spinetti did not contribute only with his knowledge of the market: he personally conducted the selection of the technicians to be contracted or hired to supplement Parma's lack of specific knowledge of cash dispenser design. The selection was conducted among former employees and partners of Mr. Spinetti.

Cohen and Levinthal (1990) observed how the ability to evaluate and utilize outside knowledge depends on the level of prior related knowledge possessed by the company.

Related knowledge includes basic skills, a shared language, and up-to-date knowledge

of the most recent scientific or technological developments in a given field. In this respect, boundary-spanning roles provide the related knowledge that entrepreneurs often lack, especially when they approach new scientific or technological domains. In entrepreneurial ventures that build on scientific knowledge platforms and require the performance of activities of scientific nature (lab tests, trials, etc.), internal scientists may provide the knowledge required to identify, contact and select academic institutions. Furthermore, boundary-spanning roles may help extend the search from entrepreneurs' personal networks to broader networks that may even include their personal ones — what Dubini and Aldrich (1991) call the "extended network" — thus reducing the time and resources invested in collecting information about a specific domain.

Boundary-spanning roles did not only help select external partners, but also facilitated subsequent interaction. Microalgae, for instance, a start up in the field of biotechnology, was born as a small research lab where academics conducted experiments in their spare time.

As the company evolved and became a research organization with a range of external contributors, a permanent staff was selected on the basis of its capacity to interact with these contributors, rather than on previous experience in the business. The employment of an agronomist and an electronic engineer marked a substantial advance in the project, as Microalgae was staffed with persons that could act as a nexus for the contributions of scientists and researchers from different universities, as well as for the suppliers of the various technologies required by the project. Microalgae's owner, Mr. Gregorini, acknowledged the merit of the two technicians in connecting the results of past studies on the physiology of seaweed with the technical arrangements that helped to reproduce an ideal environment for the growth of micro-seaweed on an industrial scale.

4.2 Physical distance

When required to select a new partner, most entrepreneurs showed a tendency to look first at the competence level of the prospective partner. This criterion, however, did not always lead to success. Evidence from the cases seems to indicate that the physical distance of partners may negatively influence the frequency of interaction and the effectiveness of the collaboration. Take, for instance, the case of Petroltecnica, a company that offers cleansing services to the oil industry. When looking for a partner to develop the support truck for its tank-cleansing robot, the company's first choice fell on one of the leading producers of tank-cleansing trucks, a company located in Pordenone — more than 300 km from Petroltecnica's headquarters in Rimini. However, after a month of loose interaction, during which Petroltecnica obtained little or no replies to the numerous designs and plans submitted to the partner, Mr. Pivi, Petroltecnica's owner, reneged on the contract and looked for another working partner.

According to him, the distance factor impeded the establishment of a cooperative spirit required for a timely and effective completion of the project. As he later explained to us: "the physical distance between their team and ours hampered the creation of the basis required for them to understand our needs here at Petroltecnica". Mr. Pivi later chose two companies located in Ferrara and Rimini, much closer to the headquarters, and the collaboration proved to be much more effective.

Mr. Gregorini, owner of Microalgae, shared a similar experience. He eventually had to

move the company's lab from Southern Italy, where the climate was more favorable and the company enjoyed State financial support, to Switzerland, where he could monitor research activity more closely and get a better understanding of the progress. Also, moving to Switzerland facilitated the search for and interaction with external technicians who provided the required technology for enabling production of micro-seaweed on a large scale, solving the technical problems that still affected the plant.

4.3 Alignment of interests

Physical distance, however, was not the only problem. Another factor affected the learning process at Petroltecnica and, to some extent, also at Tosi, Parma and, most of all, Futureplast: the specific interests of external partners. Mr. Pivi, Petroltecnica's co-owner, and Mr. Vincenzi, Petroltecnica's project manager, shared the impression that the first company that they contacted, a large-scale producer, was only marginally interested in their project, as it required the customized development of a product that was destined to be produced in small numbers. Therefore, the project was assigned a low priority. Conversely, the second company that they contacted was a design and engineering firm, whose core activity lay in the development of custom-made new products and technologies. After a thorough discussion on the objectives and the requirements of the project, the process quickly got started.

The influence of this variable was even more evident in the case of Futureplast, where the comparison of a failed and a successful project showed that the failure of the former could be attributed primarily to the absence of any real incentive for a critical contributor in the preliminary stage of the project. In this case, the reproduction of an existing technology — a plastic cable for the conduction of light — required the collaboration of CNR, an academic research laboratory with no commercial drive. Even from an academic point of view, CNR had no specific interest in the specific object of research — fiber optics — and two of our informants expressed the opinion that CNR did not even seem very interested in investing in the development of specific competencies in the field. CNR considered the project as just another external research order that they fulfilled diligently, but without particular commitment. The project never went beyond the preliminary stage.

Another project conducted by the same company — the development of a laser system — had a completely different story. The critical contributor in this case was CISE-ENEL, part of a recently privatized state-owned electric supplier. Until the mid-nineties, CISE had worked essentially as a basic research laboratory for ENEL. With the coming privatization and a more efficiency-oriented top manager, the mission of the research center was re-framed, funds for unrelated basic research were cut, and scientists and technicians were encouraged to look for external partners or clients, in order to find a profitable application for the scientific and technological capabilities of the center. CISE-ENEL came in contact with the company when Mr. Nava, an engineer from CISE, was looking for new clients for the capabilities developed in the laser technology over thirty years of activity. Furthermore, Mr. Nava had a personal interest in the project as he had already been attracted by the technology even before getting in touch with Futureplast.

In summary, evidence from the cases suggests that, when the required knowledge is distributed across a network of independent actors, successful innovation requires that all

the holders of critical knowledge share an interest in the successful completion of the project.

The design of the contractual system that frames the relationship with external partners can contribute to realigning diverging interests, providing or reinforcing incentives for all the parties to contribute with their skills and competencies to the timely and efficient completion of the process. Limited, even indirect, participation in the entrepreneurial risk and potential rewards of the project, and a clear definition of responsibilities for each stage of the process, seem to positively affect the effectiveness of the process. The contract between Futureplast and CNR, for instance, did not help compensate for the latter's lack of interest in the project, as CNR's rewards were not tied to the achievement of any objective, but only to the carrying out of a series of tests. On the contrary, the relationship between Petroltecnica and its major partner, RB1, was regulated in detail by a contract that specified, for each stage, the responsibilities of the contractor and the customer with regards to, for example, sharing information and keeping to deadlines. Each contractor was given the possibility to renege at every stage if the counterpart did not collaborate according to the norms. Parma went even further, asking Mr. Spinetti, a major partner in the project, to set up a company, Eurolab, to share the risk of the enterprise. Most technicians were offered a term contract that could be made permanent once the preliminary stages had demonstrated the industrial and commercial viability of the new product. In fact, Parma did not internalize the core of the project until a relatively late stage of development.

5. MANAGING THE LEARNING PROCESS

From the entrepreneur's point of view, learning while innovating takes place at two levels.

At a first level, learning is measured on the basis of the actual development of the desired technology, be it embodied in a product or a production process, at a reasonable cost and within a reasonable time frame. At a second level, learning is measured on the basis of the extent to which entrepreneurs manage to retain the value of the novel knowledge that has been produced. As far as the first issue is concerned, cross-case analysis led to identification of three fundamental factors that seemed to increase the likelihood of successful completion of the project: (i) possessing a related knowledge-base; (ii) retaining close control over the process; and (iii) maintaining a constant focus on end-users throughout the process.

5.1 Building on related knowledge platforms

Although all the observed companies possessed a core set of distinctive skills and expertise, in four of them, Polti, Parma, Microalgae and Futureplast, the presence or the gradual development of such a knowledge platform was explicitly linked by our informants to the advancement of the projects. For Polti and Parma, this knowledge platform resided partly in a profound knowledge of the market and partly in specific technical competencies in the design of small home appliances, in one case, and of safety devices, in the other. In both cases, these competencies formed the backbone of the projects, because they concerned the architecture of the products. External contributions were called in to develop specific components — such as the engine and the filter for the vacuum cleaner, or the CPU and the

banknote sorter of the cash dispenser — according to the indications of the two companies. Later components were assembled on the internally designed architecture.

At Futureplast, having a related knowledge base emerged as one of the factors discriminating between a successful and an unsuccessful project. In one case, although the potential application of the technology had a closer link to the core business of the company, the development of a plastic cable for light conduction required fundamentals of optics and chemistry that were far from anything that Mr. Guzzoletti and his staff had mastered before. Moreover, a search of American patents was not fruitful and did not lead to any substantial improvement. On the contrary, in the second case — the laser project — at the start of the project Mr. Guzzoletti and his assistant had already amassed a considerable body of knowledge in a specialized library. In this phase, the role of the assistant had been fundamental, not only as a "broker" of books and scientific contacts, but also because he had introduced Mr. Guzzoletti to the basic terminology and concepts of physical laws, providing him with sufficient knowledge to play an active role in the design of the system and of the various components, interacting directly with all the external suppliers.

These findings are consistent with prior research on knowledge transfer, which show that the amount of knowledge possessed by an organization or an organizational unit influences its capacity to acquire related knowledge from another organization or unit (Cohen and Levinthal, 1991, Szulanski, 1996). In this respect, building on already existing knowledge platforms considerably increased the capacity of entrepreneurs to interact with external partners, to integrate distributed competencies and skills, and to retain control over the process.

5.2 Retaining control over the process

At Futureplast, another factor affecting the outcome of the observed projects was the degree of control that the focal actor and decision-maker, Mr. Guzzoletti, was able to exercise over the process — in other words, his capacity to monitor the process and to affect its direction.

Most of the research activities that led to the successful development of the laser system took place at Futureplast's labs, while Mr. Guzzoletti was working in close contact with the external technicians. In this way, he was able to observe and discuss their tests and trials.

Reverse engineering was systematically done on all the components of the system in order to acquire all the relevant knowledge, especially on the electronic components and on the laser source, so that the company could later reconstruct the whole system autonomously.

All of this was also made possible by the related knowledge base that Mr. Guzzoletti had previously built. Instead, in the case of the plastic cable, technology development was largely outside Futureplast's control. Experiments took place at CNR, where Guzzoletti was "delegating and observing", as he himself remarked. The main research activity, therefore, was carried out mainly by CNR's researchers, while Futureplast was involved only as an external observer. Mr. Guzzoletti and the physicist, both unable to participate in the analyses that were carried out by CNR, gradually detached themselves from the process and passed by the labs only to get the results of the tests. As a staff member recalled:

> We didn't feel competent enough and, as a matter of fact, we acknowledged the leadership of CNR's researchers over the project (…) we essentially gave up the direction of the phases of the process.

5.3 Focus on end users

Finally, and not surprisingly, successful projects were characterized by a focus on end users and, to some extent, by their involvement in the development phase. In most cases, the focus was present from the very beginning. In four cases, the learning process that sustained innovation was triggered by every-day experience and by the recognition of an unsatisfied need: a more efficient and inexpensive support for silk screens; a safer way to cleanse large oil tanks; a more practical and efficient way to filter dust in vacuum cleaners; and a smaller and more versatile safety device. A common feature of all these cases was direct contact with end-users: entrepreneurial learning was often rooted in a profound knowledge of a certain context of use, which facilitated entrepreneurs' recognition of unmet needs. Direct involvement in customers' problems and activities led to the discovery of opportunities for introducing innovative products and processes or the upgrade of the existing ones. In some cases, like Tosi or Petroltecnica, entrepreneurs were trying to solve their own problems in the first place — trying to improve the efficiency, speed and safety of their own industrial processes. Only later did they realize the commercial impact of the technologies they had developed. Mr. Polti's ideas which led to innovative small appliances were often triggered by conversations with housewives, laundry services and professional cleaners.

Furthermore, comparing the cases of Polti's new water-based vacuum cleaner or Tosi's revolutionary roll print system — the commercial success of which was remarkable — with other products whose commercial value is still to be tested, we observed that — not surprisingly — learning processes that were guided by a clear perception of customers' needs and of industrial and commercial constraints had a better chance of ending up in a new product or process that met the favor of the market. Some projects successfully developed new technologies. Others managed to build a commercial success. What differentiated these projects was that decisions were often taken having in mind not only technical feasibility or performance, but also appeal to customer preferences, coherence with the customers' mode of use and fit with the requirements of the distribution process. End users were frequently involved in experimenting and prototyping. At Polti, prototypes were tested personally by the employees or given to "expert users", such as the company's cleaning ladies. At Parma, bank and post office personnel gave their direct impressions and suggestions to improve the new banknote sorter. Involving users, as a manager explained, was meant "to take into account all the critical variables and all the required technological investments".

Finally, Mr. Tosi admitted that licensing his product off to two large distributors had been a major mistake: as they were in direct contact with users, distributors quickly understood how the new technology could be improved. A few months later one of them released a competing technology that, while circumventing the patent, offered customers a viable alternative to Tosi's products.

6. RETAINING THE LEARNING OUTCOME

As we have observed earlier, a critical issue for entrepreneurs is not only the successful development of a new product or process, but also the appropriation of the full value of the set of knowledge structures that constitutes the result of the innovation process. The issue is critical, as only part of the knowledge that is produced in the course of the innovation process is codified in technical specifications, user manuals, etc., and, therefore, is easily appropriated.

Another part is tacit and resides in people's experience, skills, personal knowledge, etc. (Polany, 1966). This tacit component of the newly generated knowledge may be even more valuable than the codified part. A considerable body of literature suggests that competitiveness rests on the accumulated, and largely tacit, knowledge of technologies, markets and users — in other words, on a set of core capabilities, of which new products and processes are the physical embodiment (Leonard-Barton, 1995). Besides the basic design of a new product or a new process, the value of an innovation project lies in the development of specific — and largely tacit — competencies in new technological domains or knowledge about specific users' needs. These competencies, in turn, offer the basis for future "streams of innovation" (Tushman, Anderson and O'Reilly, 1997) that build on the knowledge accumulated in the past.

The tacit nature of valuable knowledge imposes on entrepreneurs the adoption of different strategies to retain the largest possible fraction of the newly generated knowledge. The entrepreneurs we observed mainly adopted three broad strategies. Some entrepreneurs asked external partners to work in close contact with internal staff, in order to encourage and facilitate socializing among project members and, ultimately, the absorption of fractions of their partners' knowledge and skills. Later, they pressed their collaborators to formalize as much as possible their experience in reports, user manuals, etc. in order to codify much of the otherwise tacit knowledge produced in the process. Finally, some entrepreneurs were personally involved throughout the process and personally acquired much of the tacit knowledge produced in the project.

6.1 Socialization

At Polti, Parma and Microalgae the successful integration of all the external contributions required redesigning the components and the architecture of the product or the process in order to improve the performance of the system and the fit between all the parts. In turn, this required partially acquiring the skills and competencies of external partners. This knowledge, however, was largely tacit. Part of the technical knowledge involved in the design of vacuum cleaners or banknote sorters, for instance, is not codified in manuals, models or procedures, but is the product of experience. As our informants explicitly declared, if a company with no previous experience in the field wants to learn how to do it in a reasonable time and at an affordable cost, the only way is to hire somebody with experience that can transfer that knowledge to the company. As Mr. Pogliani, chief engineer at Polti, put it:

> I have been in the appliance business for more than twenty years. There are no manuals that teach you how to design a vacuum cleaner. The best way to learn is to work with somebody who's already done it.

Knowledge, however, was not transferred through formal training, but as external partners and internal staff — sometimes the entrepreneur himself — worked together. In the case of Polti, for instance, as vacuum cleaners were new to the company, they temporarily hired a retired engineer who could assist the company in the initial development of the first line of products. Parma asked external technicians involved in the development of the first prototypes of banknote sorters to move to the company's labs. Futureplast selected the supplier of the laser source, not only on the basis of its reputation and reliability, but also because of its willingness to send a technician to the company's lab for a few weeks in order to verify the adaptability and compatibility of the source with the new system and to transfer all the specific knowledge on its modes of use. Evidence from this case, therefore, shows that one way to facilitate the appropriation of external tacit knowledge is to create conditions for external partners and internal personnel to work together on experiments, design, etc.

This finding is congruent with past research on knowledge transfer that has shown how the transfer of tacit knowledge requires a process of socialization (e.g. Nonaka, 1994).

6.2 Codification

Codified knowledge is valuable insofar as it warrants a license, and indeed it has to be made explicit in the license itself. This is also a reason why codified knowledge can be imitated more easily, raising questions on the sustainability of its value. However, as Thomas Allen observed at the end of a ten-year study of technological transfer and dissemination within research and development laboratories:

> The documentation produced in the course of most technological projects (…) is incomplete. It generally assumes a considerable knowledge of what went into the physical product. Those unacquainted with the actual development therefore require some human intervention to supplement and interpret the information contained in this documentation (1977, p. 5).

In the Microalgae case, for instance, besides the basic design of the photobioreactor that was eventually licensed, what really made the company competitive was the experience gained in managing the production facility. As Mr. Carella, a member of the permanent staff, told us:

> We patented a general photobioreactor for the production of any type of algae, without specifying the type of culture What the patent deals with is exclusively linked with the reactor and its features. In other words, even when the patent expires, Microalgae will still have an edge because its strength lies in the knowledge that we have collected in years of research and experimentation aimed at making the photobioreactor fit for any type of alga.

Although a competitor could easily circumvent the patent and replicate the basic ideas behind the new production process, its effective management requires an intimate knowledge of how the various variables affect the ecology of the micro seaweed — an experiential knowledge that Microalgae's staff had acquired in the course of projects through various trials and tests.

In other cases, such as Parma or Futureplast, besides the codified knowledge embodied

in the product, the development process led the companies to acquire specific — and largely tacit — competencies in new technological domains. All the entrepreneurs we observed, therefore, patented their new creations, but often they also asked internal and external contributors to keep track of the progress made, by formalizing routines, procedures, and manuals that converted experience into hard information. This helped them to retain at least an understanding of the steps and the ways in which advancements were achieved.

6.3 Personal involvement

Evidence from the cases indicates that a critical factor for the effective appropriation of tacit knowledge was a deep and direct personal involvement of the entrepreneur in the project.

At Futureplast, most of the research activities that led to the successful development of the laser system took place at the company's labs, while Mr. Guzzoletti was working in close contact with the external technicians. Guzzoletti was able to observe and discuss their tests and trials. Reverse engineering was systematically done on all the components of the system in order to acquire all the relevant knowledge, so that the company could, later, reconstruct autonomously the whole system. As Mr. Guzzoletti remembered:

> At the end of each working day, when the external technicians had left, we locked ourselves up in the lab until 2 o'clock in the morning to repeat every test and to disassemble every component, until we were sure that we had understood its nature and potential. In this way, we gained an intimate knowledge of every component, which made it easier for us to develop and improve the integrating system.

At the end of the project, the profound knowledge of the technological subsystems acquired by Guzzoletti and his staff allowed to reproduce internally most of the components and adapt them to the specific needs of the system. While intense socialization helped some companies to acquire part of the existing skills of the external partners, direct involvement in development activities facilitated the appropriation of the newly created knowledge.

The degree of involvement of the observed entrepreneurs, however, differed significantly.

In the case of Futureplast, Tosi and Petroltecnica, Mr. Guzzoletti, Mr. Tosi and Mr. Pivi personally followed the whole process, while, at the other extreme, Microalgae's Gregorini left considerable autonomy to the experts, since he did not have the necessary competencies to understand what they needed in order to develop the product. Again, what seems to have made the difference was possessing prior related knowledge. Entrepreneurs with a technical background displayed a higher involvement in the process as they took an active role, continuously offering suggestions, bringing new ideas and at times even intervening in the solution of minor technical problems. In other cases, all the designing and experimenting was left to the technicians, while the entrepreneurs periodically intervened to keep the development process oriented towards the market. Comments and suggestions tended to concentrate on the commercial side of the product, its congruence with the characteristics of the customers and the distribution. In these cases, however, the benefits reaped by the entrepreneur did not go much farther than the commercial value of the product or the license.

7. CONCLUSIONS

In this chapter we have argued that entrepreneurial innovation rests on a generative learning process aimed at developing new knowledge structures embodied in a new product, process or service. Combining past literature and evidence from our research we have proposed that entrepreneurial innovation be conceived as a collective process that draws on multiple external contributions. Successful entrepreneurial innovation rests on the capacity to combine one's own knowledge and external knowledge in new and valuable ways. We have also reported findings with factors that affect the processes of social interaction that take place as multiple external contributions are involved in the process. While most scholars now seem to agree that networking is critical for the success of entrepreneurial firms, most literature in the field concentrates on the characteristics that an effective network should have in terms of size, density, etc. Less has been written on practices and conditions that improve the capacity of entrepreneurs to make an effective use of their networks. In this respect, our study may be a first step towards a deeper understanding of how networks are, or should be, managed in order to exploit fully their potential contributions to the innovation process that takes place within the firm. Evidence from our study suggests that relying on boundary-spanning roles, maintaining a physical proximity with partners, and carefully designing an incentive system that links all the contributors to the innovation may improve the effectiveness of collective interaction. Furthermore, building on existing knowledge platforms, retaining control over the process and focusing on end users throughout the process positively affect the successful completion of the project. Finally, facilitating socialization between external partners and internal staff, explicitly asking the latter to report their experience in formal documents, and close involvement in all the activities where valuable knowledge is produced may increase the successful retention of newly-generated knowledge.

More generally, our findings seem to suggest a knowledge-based theory of entrepreneurial activity, according to which an entrepreneur at the center of an innovation network should directly perform, or at least keep a high degree of involvement, in all the activities where valuable knowledge is produced. Contracting out these activities may reduce the amount of knowledge appropriated in the process, and losing control of them may reduce the pace and effectiveness of innovation. We observed that the criticality of the retention of new knowledge grows as larger valuable fractions of this knowledge fall outside the codified domain. In part, this happens because the technology that is embodied in new products or processes is only partially codifiable, and the exploitation of the potential of a new technology often requires a degree of tacit knowledge that is developed over time as a by-product of the innovation process. In part, this is related to the fact that often the real value arising from a development process is not related so much to the resulting product, as to the acquisition of new competencies that form the basis of a future stream of innovation. The fact that other actors, internal or external, retain a large fraction of this tacit knowledge poses a serious question on the possibility for the entrepreneur to appropriate the whole value arising from the innovation process. Although having a license helps the entrepreneur to seize the value of the codified portion of the newly created knowledge, how to retain the tacit portion is still partly an open problem.

Our findings may also have important implications for the practice of entrepreneurship.

Past research indicates that the entrepreneurs' knowledge base may affect their capacity to recognize valuable opportunities (Shane, 2000). Our findings suggest that prior related knowledge may also affect the capacity to exploit an opportunity and to develop an idea into a fully-fledged new product or service. Indeed, our study shows the importance of mastering the technological platforms on which the development of new products rests. In the absence of a related knowledge base, entrepreneurs may eventually be forced to abdicate their leading role in the development process and gradually lose the capacity to assess the levels of risk and return associated with the completion of the project. In sum, our findings seem to discourage from initiating explorative ventures whose technological platforms are distant from the entrepreneurs' core technological and scientific domains.

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TECHNOLOGICAL ENTREPRENEURSHIP: KEY THEMES AND EMERGING RESEARCH DIRECTIONS

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1. INTRODUCTION

A vast body of research exists on the importance and varied contributions of technological entrepreneurship to job creation, economic and social development, and growth. Technological entrepreneurship refers to the creation of new firms by independent entrepreneurs and corporations to exploit technological discoveries. This chapter reviews key themes in recent research on this important topic and highlights areas that deserve attention in future research.

The chapter organizes the discussion along three levels of analysis: individual, collaborative and collective. Progress made in studying each of these levels is highlighted and research questions for future investigation are identified.

Technological entrepreneurship is a key source of economic and social progress. It refers to the creation of new firms by independent entrepreneurs and corporations to exploit technological discoveries. These new firms create jobs, contribute to the well being of their communities and generate wealth for their owners (Bhide, 2000). These firms are also the change makers in their respective industries as they bring in new technological paradigms that alter the dynamics of competition and rules of rivalry (Acs and Audretsch, 1990; Zahra and Bogner, 2000; Zahra, Nash and Bickford, 1995). Understandably, a vast body of research has emerged over the past three decades on technology-based entrepreneurship.

This chapter focuses on technological entrepreneurship in young and established companies. The chapter synthesizes the key themes in recent research conducted at multiple levels of the analysis. It also highlights the central debates in the literature on technological entrepreneurship and concludes by outlining key and emerging research directions that can improve scholarship and inform public policy discussions.

To achieve our goals, we offer a typology that focuses on research that has been conducted at the unitary, collaborative and collective units of the analysis. Our discussion of the *unitary* level of the analysis examines technological entrepreneurial activities performed at the firm level, covering the strategies individual companies follow to take their technologies to the market. The *collaborative* unit of the analysis focuses on those relationships that develop

between two or more companies or entities. Collaborative units of the analysis refer to industry-wide and network-wide phenomena that come to bear on the evolution of technology as well as the entrepreneurial activities associated with the conception, development and commercialization of new technology. Technology commercialization is one of the stages in a long process by which a firm determines its market needs, conducts research that uncovers the technologies that effectively respond to these needs, tests these discoveries, develops products that embody these technologies, and then takes these products to the market. Each of these stages requires interactions with a multitude of stakeholders. Research at the *collective* level of the analysis covers industry-wide activities aimed at stimulating entrepreneurial activities and protecting the value to be gained from technological discoveries.

The chapter is organized as follows. The next section discusses the changing nature of the competitive landscape of technological entrepreneurship. We then introduce a typology of current research in this area. Once this is completed, we will discuss the key themes in research conducted at the unitary, collaborative, and collective levels of the analysis. Our attention will center on the dominant research themes, their contributions and the areas that require attention. Given the vast literature that exists on the topic, our review can neither canvass every theme in the literature nor can it analyze every study. As such, our review is not exhaustive. We conclude the chapter with a discussion of the implications of our analysis to academia, managers and public policy makers.

2.THE CHANGING LANDSCAPE OF TECHNOLOGY-BASED ENTREPRENEURSHIP

Research on technological entrepreneurship has increased significantly over the past three decades (Autio, 2000; Cooper, 1973; Roberts, 1991), reflecting three important trends. The first is the increased recognition of technology as a key driver of change (Christensen, Suarez and Utterback, 1998; Foster, 1986). Researchers, managers and public policy makers have become aware of the crucial role of technological forces in creating discontinuities that unleash gales of creative destruction in the form of innovation (Anderson and Tushman, 1990; Tripsas, 1997). Innovation, in turn, creates new companies and industries that generate wealth for the founders and society at large. The rules of competition in these industries are not well defined, and societies compete to position themselves as the pacesetters of global technological standards. Countries that succeed in establishing global standards can dominate the growth and evolution of these industries over the next few decades and as result create greater wealth for their citizens. Technological changes not only create opportunities for wealth creation, but also displace citizens and alter the fabric of a society, compelling public policy makers to be proactive in shaping the evolution of new industries.

The second trend in the literature is the recognition of the role of technology as a source of organizational competence (Christensen et al., 1998; Zahra and Covin, 1993). Competencies are the set of skills necessary to develop the capabilities that give companies the advantages over their rivals. Technology serves as a lever that organizations can use to cultivate other resources by combining them to generate new strategic weapons (Zahra, 1996b). Technological changes make traditional competencies less relevant and pressure companies to rethink how and where they compete, creating additional opportunities for entrepreneurial activities within established companies and by individual entrepreneurs.

The third trend in the literature is the growing recognition of the importance of technology commercialization for value creation (Zahra and Nielsen, 2002). Concern persists that US companies have not done well in cultivating the fruits of their inventions. Many US companies excel in creating technology but do not do as well in taking these technologies to the market.

The same observation applies also to universities. Leading research universities have created innovations, but many of these innovations have not been commercialized (Graff, Heiman and Zilberman, 2002; Miner, Easley, DeVaughn and Rura-Polly, 2001). This has deprived universities from a major source of revenue. While these challenges are universal, US universities need to commercialize their discoveries in order to offset declining state and federal support of higher education and to generate the funds necessary to support new academic programs and attract star researchers and graduate students (George, Zahra and Wood, 2002).

Universities have responded to the growing need to commercialize their technologies by creating units that perform this function. Others have increased the interface between the engineering and science schools and university sponsored programs in entrepreneurship.

Some universities have also revised their curricula and programs to foster greater interaction between their scientists and local companies. Some universities have also created capital funds to invest in these new firms (Atkinson, 1994). These efforts have been inspired by Stanford University's success in shaping the evolution of the Silicon Valley, MIT's prominent role in spurring innovation and new firm creation in the Boston area, and Cambridge University's leadership in creating new firms that have revived the local economy. Countless new companies have come into existence as a consequence of discoveries made in these and other research universities (Audretsch and Stephan, 1996; Bani, Eberts and Fogarty, 1993; Chrisman, Hynes and Fraser, 1995; Reitan, 1997; Roberts and Peters, 1981; Rogers, 1986; Rogers and Larsen, 1984; Segal, 1986). These companies have been the source of job creation, employment, and economic growth (Arend, 1999; Birely, 1986). These firms are also the source of radically new technologies (Adner and Levinthal, 2002).

3. A TYPOLOGY OF TECHNOLOGY-BASED ENTREPRENEURSHIP RESEARCH

Table 1 presents our typology of technological entrepreneurship research. The typology recognizes research conducted at three different units of the analysis. The first is the *unitary* level where researchers have examined company-specific activities such as the development of technology strategy, the use of corporate venture capital to promote technological entrepreneurship and the use of technology-based acquisitions to spur entrepreneurship in existing and new areas within the firm's portfolio. The second level of the analysis is *collaborative,* where two or more organizational entities join forces to achieve a common goal. As shown in Table 1, these activities often include strategic alliances of different types, technology development consortia and university/business relationships or alliances. The third is the *collective* level of analysis and examines on the role of the industry and professional and social networks in promoting and stimulating technology-based entrepreneurship. The following sections summarize the key findings from research in each of these areas.

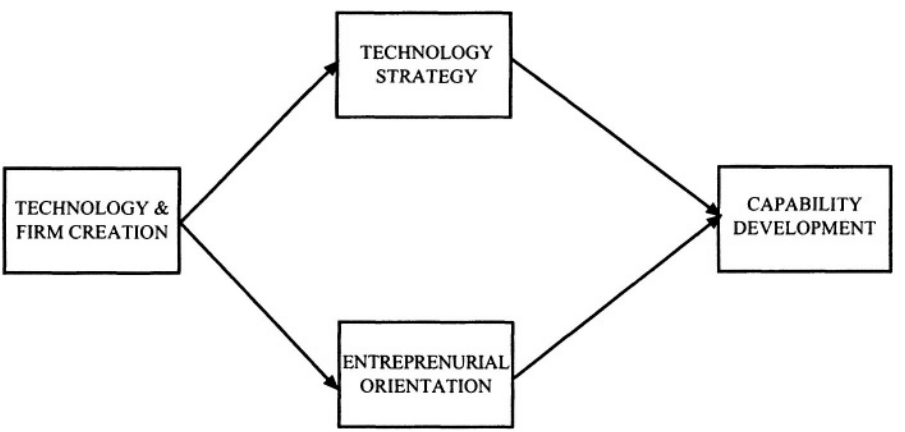
Table1. Levels of Analyses and Themes Covered in the Chapter

Level Of Analysis	Themes Covered in the Chapter	Major Strengths	Major Weaknesses
Unitary	• Technology & new firm creation.	• Breadth of issues covered and attention to their potential interactions.	• Focus on content (or outcomes) while ignoring process.
	• Technology Strategy • Entrepreneurial orientation • Capability development	• Growing attention to the entrepreneurial actions new firms undertake to offset liabilities of newness and adolescence.	• Attention given to independent ventures, while ignoring corporate ventures.
Collaborative	• Alliances • Consortia • University-Industry Alliances	• Theoretical plurality. • Coverage of a wide range of industries, in and outside the US.	• Research findings are non-cumulative because of different methods and designs.
		• Attention to the context of relationships.	• Process issues are ignored.
		• Attention to both young and established companies.	• The effect on new venture capability development is overlooked.
Collective	• Collective strategy • Networks	• Attention to contextual influences on relationships and their outcomes. • Longitudinal analyses	• Influence tactics used are not analyzed. • Socio-cognitive forces shaping industry and collective strategy are not examined.

4. RESEARCH AT THE UNITARY LEVEL OF ANALYSIS

Research at the unitary level analysis has studied the emergence of new firms based on technological change, the technology strategy that these firms use in pursuit of competitive advantage, and the role of entrepreneurial orientation (EO) in positioning high technology new ventures as well as gaining an enduring distinctive competence. As suggested in Figure 1, entrepreneurial orientation and technology strategy jointly determine the evolution of capabilities within technology-based new ventures. The evolution of capabilities is an iterative process by which the firm uses its internal and external knowledge. Consequently, researchers have explored the changing nature of the relationship between new ventures with well-established companies.

Figure 1. Key Themes in Firm Level Research on Technology Based Entrepreneurship



4.1 Technology and the creation of new firms

A vast body of research exists on the role of technology in the creation and evolution of new companies and industries. This research has investigated the role of technological resources, the external environment and the entrepreneurs' personal background factors (e.g., network relationships) on the creation, maintenance and evolution of new companies (Aldrich, 2000). Researchers have also studied entrepreneurs or individuals who have left well-established companies to create new organizations based on technologies they have discovered. This research has documented the cognitive, procedural and political barriers to innovation that exist in established companies (Page, 1997).

Researchers have also examined nascent entrepreneurs and the factors that motivate them to recognize, evaluate and exploit opportunities created by technological change in starting new companies (Aldrich, 2000). This research highlights the importance of entrepreneurs' background, prior experiences and education in spotting opportunities and creating new firms (Reynolds and White, 1997; Shane and Khurana, 1999; Zucker, Darby and Brewer, 1998). Researchers have also explored the role of contextual factors in determining which opportunities are discovered and pursued. This area has attracted countless researchers who seek to identify nascent technological entrepreneurs and follow them over time to document the choices they make (for a review, Gaglio and Katz, 2001). This interest stems from the importance of opportunity recognition and exploitation as the cornerstone of the entrepreneurship field (Venkatraman, 1997; Zahra and Dess, 2001).

Some researchers have also explored the role of universities and leading research centers in creating new businesses (Roberts and Peters, 1981; Sobocinski, 1999). These researchers have sought to document how technological discoveries make some scientists willing to take the risks associated with creating and managing new firms. Given universities' increasing interest in developing effective and productive relationships with industry, more research is being carried out on the factors that can influence the transfer of technology from university research centers and labs to society in general. The cultural divide that once separated academia from industry is beginning to erode, opening the door for a more beneficial set of reciprocal relationships. Universities are gaining revenues as well as access to important research sites and living case experiences for discussion and analysis (George et al., 2002).

Conversely, companies are gaining access to current research, inexpensive labor force in the form of graduate students, and a sense of legitimacy.

The role of universities in incubating and supporting newly founded companies has also received growing attention in prior research (Cooper, 1985; George et al., 2002). Universities have created entrepreneurship centers to work with nascent entrepreneurs and incubate their new businesses. These centers also help budding entrepreneurs in developing their business plans, provide space for their operations inexpensively, and offer guidance on effective technology commercialization. This hands-on experience in working with nascent entrepreneurs has given some universities rich insights into how entrepreneurs spot, evaluate, reformulate, and exploit opportunities. The implications of this trend for curriculum development and design is also being examined by researchers from the US and elsewhere (Reitan, 1997).

Research has also examined the challenges nascent entrepreneurs encounter as they proceed to commercialize their technologies. New technologies often signal a significant paradigm shift that existing players in the financial and economic marketplace do not easily comprehend. Nascent entrepreneurs are also ill equipped to deal with the financial issues associated with new business creation because most of them have come from academic, engineering and research-oriented careers having spent most of the adult life in research centers and university settings Universities are exploring ways to educate and prepare nascent entrepreneurs to deal with these issues. This training covers the market mechanisms by which new ideas are evaluated and selected for development and financial support via venture capitalists and other funding sources (Chrisman et al., 1995).

Past research has enriched our appreciation of the conditions that foster new firm creation as a consequence of technological discoveries and progress. This research has also informed

us considerably about how new organizations come into existence and the variables that shape their evolution and destinies. Researchers have drawn on the resource-based theory (Penrose, 1959; Alverez and Busenitz, 2000; Barney, 1991) in illustrating the effect of the stock of the tangible and intangible resources that nascent entrepreneurs employ to establish their companies. This work shows that entrepreneurs remain faithful to the knowledge and experiences that they have gained in pnor careers, be it within industry or research centers (Aldrich, 2000; Shane, 2000).

Another contribution of prior research is showing how macro and micro issues come to bear on the creation and development of companies (Bell, 1991; Bhide, 2000). Researchers have explored the effect of the tax system, regulatory environment and competitive forces on the creation and growth of high technology new ventures. They have also linked nascent entrepreneurs' experiences, background, and network relationships, and social capital to the creation of new firms.

Research on the creation of new technology-based firms suffers from three shortcomings.

The most obvious is its static research designs. Most prior research has focused on the creation of particular companies by particular individuals providing only a snapshot of the process by which these organizations have come into existence. Most studies have ignored the changes that occur at the different exploration and exploitation stages that occur at the birth of the organization. Further, past research has not analyzed those companies that have come into existence but later have ceased to continue their operations either because of poor timing or technological or other sociological shifts. Consequently, past research has been limited by survivor bias in that only successful companies have received attention while failing companies have been overlooked. Clinical analyses of failures can be informative in building theory of new venture creation. Finally, past research has overlooked the changing role of technology from the creation of companies to exploiting these technologies as means of creating value for their founders and owners. It is often assumed that the creation of new companies is the ultimate mechanism by which technological discoveries are harvested and exploited for competitive advantage. Some researchers have, therefore, ignored the important strategic choices entrepreneurs make about the location of their businesses, the relationships they develop with the external environment, and the technology strategies they have adopted to transform their discoveries into profitable ventures.

4.2 Technology Strategy

Understanding the process by which new firms exploit opportunities highlights the importance of technology strategy, as shown in Figure 1. This strategy embodies the content and process of the strategies that young companies follow in exploiting their technological resources.

Research on the content of technology strategy examines the effect of R&D intensity, the composition of the R&D portfolio, timing of technological development, the internal and external sources of innovations, and the relative focus on product versus process innovations (Zahra, 1996a). These variables often influence the success or failure of young entrepreneurial as well as established companies. This research has been conducted in a number of industries that include software, biotechnology, cement and gypsum, and telecom, among others (Utterback, 1994). The results of this research have been robust; indicating

that technology strategy plays a critical role in improving a company's financial performance (Li and Atuahene-Gima, 2001; McGee, Dowling and Megginson, 1995; Zahra, 996b).

Despite the progress that has been made in understanding the content of the firm's technology strategy, less research has been conducted on the process by which companies develop and choose the various components of that strategy. This gap in the literature is alarming because process variables significantly influence the quality of the strategic choices that companies make and the ability of these companies to implement their technology strategy. Further, most of the descriptions about the process by which technology strategy is chosen have been extracted from samples of large companies in relatively well-established industries. This is puzzling because many of the younger companies compete in highly uncertain and fast-changing dynamic environmental settings. Therefore, some of the descriptions that have been offered in the literature about how to develop technology strategy in relatively stable industries may not apply in those dynamic settings.

Equally puzzling is the absence of attention to the dynamic interplay that occurs between market forces, the entrepreneur's goals and personality, and the technology itself. This interplay can influence whether the entrepreneur releases the technology to the market and how and when she (he) does so. Longitudinal analyses of this type are lacking, which makes it hard to understand how new industries come into existence and how they evolve over time (Van de Ven and Garud, 1989) The dearth of empirical analysis of this type make it difficult to determine the relative contribution of the environment, the entrepreneur and technology to the success and failure of emerging companies, especially in younger industries where technological and marketing risks are high. In these industries, entrepreneurs have to experiment with various combinations of resources (both tangible and intangible) before selecting the strategy they will pursue in commercializing their technological discoveries.

Research on technology strategy in younger, entrepreneurial companies has a number of strengths. As noted, this work has examined a wide range of industries in high and low technology sectors both in the US and elsewhere. This allows researchers to draw inferences about the contributions of the content and, less so, process variables of technology strategy to a young company's market and financial performance. These effects vary between new ventures created by independent entrepreneurs and those developed by well-established companies.

Recent work on technology entrepreneurship in young companies also shows attention to the dynamic interplay between competitive and technology strategy. Researchers have shown that technology strategy variables play a major role to ensure the successful execution of a firm's competitive strategy. Researchers have also identified some of the contextual variables such as firm ownership that might influence the nature of the link between competitive and technology strategy and the financial payoff from this link such as improved financial performance (Zahra, 1996a).

Research on technology strategy in new ventures has had several shortcomings. First, as we have observed earlier, researchers have examined the content of technology strategy while overlooking the process by which these strategies are crafted. It is also unclear from the literature if various process variables play different roles in different environmental settings because researchers have not linked process variables effectively to new venture performance across different environments. Research has also ignored the potential interplay between the dimensions of a company's technology strategy. Does a shift in a firm's R&D

portfolio, for example, influence the timing of innovations and their introduction to the market? Does a change in the sourcing of technological capabilities influence the ability of the firm to pursue certain innovations? These and similar issues have not been examined systematically. This makes it difficult to identify the implications of these strategic choices for public policy and how to stimulate innovation among technology-based entrepreneurial companies.

Past research has also ignored the interplay between process variables and the content of the company's strategy. Thus, how the process influences the choice of various components of the technology strategy is unclear. Does the process constrain the content of the strategic choices in some circumstances but not others? If so, when and how? How do companies leverage their processes or streamline them to expedite the selection of various strategic choices? How does the entrepreneur's prior knowledge and experience influence the choice of these processes? Do companies change these processes as they gain knowledge about their markets and technology?

Research on technology strategy in entrepreneurial companies has lacked consistency in examining the contextual influences on the relationships between technology strategy and performance. Some have looked into specific phases of the life cycle or the industry settings, providing some rich observations about the changes that occur over time in a new venture's technological choices. Yet, the organizational life cycle concept itself has been mired in controversy. Thus, we need more conclusive research on the effect of the changes in industry and organizational life cycles and their implications for the technological choices companies make.

4.3 The entrepreneurial orientation (eo) of new technology ventures

Researchers have also attempted to delineate between the nature and the effect of EO in young high-technology ventures. This research has focused on three areas: the nature and dimensions of EO; the effect of EO on performance; and the contingencies that influence the relationship between EO and organizational performance especially within high-technology new ventures. This research is grounded in the observation that some new ventures act in innovative ways that create entrepreneurial rents that exceed ordinary profits gained from effective management. This part of the chapter discusses these three issues.

Research indicates that EO is a multi-dimensional construct. Most research follows Miller's (1983) definition, which highlights three dimensions. The first is the willingness to take calculated risks even when the payoff from entrepreneunal activities is uncertain. The act of creating new firms is one example of this propensity to take risks (Gartner, 1985). The second dimension is proactiveness, which is evidenced in being on the forefront of technological and competitive change in the industry. Some new ventures capitalize on existing resources and technologies. Others, however, compete by challenging the status quo and distributing existing rules of competitive rivalry. These latter firms use their technological resources to achieve this goal (Zahra and Bogner, 2000; Zahra et al., 1995). The third dimension is innovation, which centers on introducing new products, systems and processes that transform industry boundaries.

A growing body of research explores the effect of EO on organizational performance (for a review, Zahra, Jennings and Kuratko, 1999). Most of this research has been conducted in established companies. Yet, researchers seem to have adopted the popular definition of EO without examining its unique dimensions within entrepreneurial high-technology companies that have existed for only a few years. It is not clear from the reading of the literature if EO is different in young, high technology firms compared to those companies that compete in traditional industries. This issue requires attention given the fact that it is widely held that young high-technology companies are aggressive in their pursuit of opportunities and identification of opportunities that differ significantly from those pursued by their well-established rivals. If technology entrepreneurs are the change makers, as widely assumed in the literature, then we need to investigate how their companies differ in their EO from established companies in the same industry.

Several studies have been published on the affect of EO on organizational performance. Zahra and colleagues (1999) provide a comprehensive review of the results reported in prior research. They conclude that EO, for the most part, positively influences financial performance as measured by profitability and growth. This positive effect varies significantly from one industry to another and from one period of time to another. These variations reflect the various contingencies that moderate this complex relationship. Zahra and colleagues (1999) also observe that other dimensions of organizational performance have been overlooked in past research. For instance, the non-financial measures of organizational performance have not always been carefully documented in the research on the EO-performance relationship.

Clearly, more research is necessary because young companies often establish non-financial milestones and use them in making expansion decisions.

Research on high technology new companies has also failed to explore the implications of EO for these firms' learning and capability building. EO promotes organizational actions that enhance learning. When EO is high, managers scan their environments for opportunities and threats, invest in new business initiatives, build organizational assets, and hire employees with diverse skills and knowledge. Strong EO is conducive to frequent interactions with vendors and suppliers. It also promotes collaboration with companies in and outside the industry. Collectively, these activities enhance organizational learning that expedites the development of new venture capabilities, as suggested in Figure 1.

4.4 Entrepreneurialism and capability development

Researchers have shown an interest in the evolution of capabilities in young entrepreneurial companies. These firms usually experience major "liabilities of newness" that limit their ability to acquire the resources necessary to develop capabilities. These firms also exhibit serious imbalances in their resources. For example, many have strong technological assets but have limited production, marketing and distribution capabilities. Attempting to offset the limitations of resources can be a challenging task to high technology entrepreneurs.

As Figure 1 suggests, one of the objectives of entrepreneurial firms' technology strategy is to accumulate experience and resources that can be integrated into a new set of capabilities.

How the new firm assembles and then integrates resources depends also on its EO, as shown in Figure 1. Starr and MacMillan (1990) propose that new firms do not have to own

the resources they use to have capabilities but, instead, can employ multiple strategies to effectively utilize others' resources. In essence, the entrepreneur can use her (his) social capital to build links to resource providers, acquire or borrow resources, and work hard to integrate internal and external capabilities. EO is important for the acquisition of resources and plays an important role in integrating these resources in ways that create unique advantages for the firm. EO also influences the approaches managers use in resolving the potential tradeoffs they might encounter in building new capabilities. These tradeoffs are poorly understood because only recently researchers have begun to analyze the processes of capability evolution. These processes entails considerable experimentation and is akin to solving a puzzle. It is also multi-stage in nature requiring a clear vision of which capabilities to build, deciding how they will be built, and the timing capability building (McGrath, MacMillan and Venkataraman, 1995). Given the dearth of empirical research on these issues, greater attention to the process of capability building and the contextual influences on this process is essential.

5. RESEARCH AT THE COLLABORATIVE LEVEL OF ANALYSIS

Over the past two decades, interorganizational relationships have received considerable attention in the literature. For high technology new firms, such relationships include a variety of strategic alliances, cooperative research arrangements such as R&D consortia, and industry-university collaborative arrangements. Strategic alliances represent the most general class of collaborative arrangements and as such encompass equity joint ventures, marketing or product development partnerships, and technology licensing arrangements (Oliver, 2001).

Alliances may or may not involve the creation of an independent entity in which partners share equity stakes. A large body of research has been developed to understand the key aspects of strategic alliances, including the reasons for their formation, their development and management, and their implications for organizational performance (Das and Teng, 2001), especially among high technology ventures.

R&D consortia are a specialized form of an alliance which have unique structural characteristics and goals. Thus, a smaller, distinct body of research has developed in the last decade that focuses on this type of collaborative arrangement. As with alliances, the key topics of interest include the reason firms form these consortia, their structure, the processes underlying their formation, and the benefits member firms gain.

Another important type of collaborative arrangement that has received a relatively limited amount of study to date is the cooperation between industries and universities. To a certain extent, this literature overlaps with that of R&D consortia which includes research universities as members. However, given the significance of this arrangement for industry, universities, and society at large, below we review the major contributions of this literature as well as its limitations and identify possible future directions.

5.1 Strategic Alliances

As firms face increasingly turbulent market and technological environments it becomes even

harder to develop and maintain the necessary capabilities for competing successfully. As a result, we have observed the growing number of strategic alliances in a variety of forms.

Scholars have responded to this explosion of new organizational forms with research that examines the reasons for forming such arrangements, the structure and types of strategic alliances, and the performance implications for high technology new firms that engage in these arrangements (Das and Teng, 2001; Oliver, 2001).

There is consensus that firms form strategic alliances to access new market and technological capabilities. The phenomenon of strategic alliances is most evident in high technology fields such as biotechnology, internet-based firms, communications technology and software, which are often inhabited by smaller, younger organizations facing the need to rapidly acquire new capabilities such as marketing or production. Since these organizations frequently do not have the history, resources, or time to develop these important capabilities in-house, they seek to partner with other organizations. These 'other' organizations will frequently be larger, established corporations with strong marketing and production capabilities.

Alliances, therefore, enable high technology new firms to pursue innovation strategies while mitigating potential negative performance effects that result from the high resource requirements of such a strategy.

As the acquisition of capabilities is a key motive for the formation of alliances, an important theoretical argument that has evolved in the literature centers on organizational learning. In order to successfully identify potential alliance partners, acquire, assimilate and eventually exploit the newly acquired capabilities, new technology-based firms must develop their own ability to learn. An important theoretical construct that describes this ability is the notion of absorptive capacity. A firm's absorptive capacity is based upon its pre-existing stocks of related knowledge. Thus, to the extent that there is some degree of common experience resulting in compatibility between the stocks of knowledge of alliance partners, they will be able to successfully learn from one another and exploit their newly acquired capabilities (for a review, Zahra and George, 2002).

A significant part of the literature on strategic alliances has studied the performance consequences of alliance membership. This literature has found very mixed results, with some studies citing improved financial performance and others reporting neutral or even negative consequences for member firms. Drawing upon the organizational learning perspective, recent research has found that a firm's absorptive capacity is the key to whether they are able to acquire and exploit new knowledge and therefore improved their rate of innovation and their market performance. This is especially the case in high technology new firms.

To date, research on strategic alliances has been limited in the richness of research methods employed. Frequently, survey and secondary data are the primary tools and models that focus on the variance explained in the dependent variable. Though important, this approach to studying dynamic inter-firm relationships ignores the processes by which alliances are formed, governed, and dissolved. There has also been a tendency to ignore the role of management in developing and maintaining strategic alliances. Alliance formation involves important decisions relating to trust, control and risk (Das and Teng, 2001). These issues can determine the success of alliances in high technology industries. It is therefore desirable to examine what managerial attributes may contribute to the formation and

governance of these inter-organizational arrangements.

The strategic alliance research to date makes several contributions to our understanding of entrepreneurial strategies of new technology-based firms. One of the most important is the notion that firms must engage in explorative learning beyond their own boundaries in order to rapidly acquire new knowledge and capabilities. Past research indicates that high technology new firms must also develop capabilities with respect to the formation and management of their alliances with others. Those firms that are effective in this regard can develop a source of enduring competitive advantage over their rivals. Research from the biotechnology field suggests that firms in dynamic high technology environments risk their own survival if they are unable to effectively engage in explorative learning through strategic alliances (Oliver, 2001). Further, organizations of different sizes and stages of development seek different things from their partners (e.g., Hitt, Dacin, Levitas, Arregle, and Borza, 2000). Rather than being an obstacle to organizational learning, alliances allow the development of symbiotic relationships. The challenge, however, is that it is harder for such dissimilar firms to exchange knowledge when they have less in common in terms of culture, organizational structure, and strategic goals.

5.2 R&D Consortia

As a subset of the more general forms of interorganizational arrangement, R&D consortia represent a very specialized form. R&D consortia may be defined as a non-equity agreement among two or more firms where all partners share both costs and results of R&D. Such consortia have become increasingly widespread in the US following the enactment of the National Cooperative Research Act in 1984. This organizational form has been credited to the revival of whole industries such as semiconductors, through the rapid dissemination and integration of diverse forms of technological knowledge. The effect of R&D consortia is to accelerate the product and process innovation cycle, thereby enhancing the competitiveness of member firms. Following the explosion in the number of R&D consortia, researchers have attempted to explain why firms form and remain in such arrangements, what the benefits of membership are, and what structural forms and formation processes were observed.

Firms, especially high technology-based ventures, join consortia to access new knowledge and technologies. An important distinction is that this knowledge may sometimes be very remote from commercial opportunities. Technological knowledge from R&D consortia is in some cases abstract and pre-competitive. Firms that engage in such consortia aim to spread the risks associated with R&D investments and gain early exposure to technologies that may relate to their future products and processes. The implications of consortia for high technology new ventures are not well understood.

A limitation of early research on consortia is the diverse theoretical perspectives adopted by scholars. At one extreme, the market forces theory (Baumol, 1993) attempts to explain consortium membership in terms of environmental forces such as the level of competition, complexity of the technological environment, and the nature of the products produced (whether complementary or substitute products). At the other extreme, strategic behavior models suggest that cooperation represents a strategic response to current market positioning

and is the result of a search for synergies in response to environmental uncertainty (e.g., Hagedoorn, 1993). In truth, both explanations may contribute to why firms cooperate. That is, R&D consortia are formed in response to specific environmental and firm level factors.

Several environmental factors increase the likelihood that organizations will cooperate in R&D consortia. These factors include: the level of competition, the rate of environmental change, the speed of the product life cycle, the extent to which the industry produces goods or services that evolve incrementally and innovations are complementary rather than substitutable. At the firm level the amount of resources available for R&D investments, the relative strength of a firm's competitive position (followers are more likely to join than industry leaders), and its relative level of performance are all important factors leading to the decision to cooperate in R&D consortia. The importance of these variables to young vs. established high technology firms have not been fully investigated.

Besides analyzing companies' reasons for joining, scholars have suggested that R&D consortia may be differentiated according to the formation process and purpose. With respect to the processes underlying their formation, R&D consortia may either emerge naturally or result from the intervention of some triggering entity (Doz, Olk and Ring, 2000). The emergent forms result from the identification by members (and potential members) of common interests and shared external threats such as the emergence of new technologies, new competitors from abroad, or new governmental interventions. These consortia are likely to be composed of firms from the same or similar industries. In contrast, triggered or engineered forms of consortia are formed in response to some organizational catalyst such as a trade association or governmental agency (e.g., the National Science Foundation). These consortia will frequently be composed of members from diverse industries and without a common strategic agenda. Further research is needed to examine the implications of these different formation processes for consortium effectiveness and firm level outcomes such as technology acquisition. The differential benefits that accrue to young vs. established firms should also be considered.

A second characterization of consortium emphasizes the purpose for which they are formed (Barnett, Mischke and Ocasio, 2000). While some consortia are formed for a highly specific purpose, such as the development of technology standards, others exist to explore basic, pre-competitive research. The implications of these two types for consortium and firm level outcomes have not been fully explored, especially among high technology new ventures.

These firms usually have different knowledge bases that differ significantly from those of established companies.

The literature on R&D consortia has several limitations. First, there has been a strong emphasis on explaining the variance in outcomes such as consortium membership while the processes underlying these decisions have been ignored. This is due to the availability of membership data through secondary sources and the relative difficulty of examining the decision processes of executives with respect to joining consortia. Available case study and survey data show, however, that different processes and purposes represent important moderators of organizational outcomes. Further analysis is needed to link the underlying processes with the changes in outcomes such as the acquisition of capabilities, maintenance of membership and consortium survival among high technology new ventures.

Second, the consortium literature has been dominated by studies of R&D consortia

formed in the US between 1984 and 2000. A greater emphasis upon the nature, role and contributions of consortia developed in other countries is necessary. There is a need to compare the formation purposes, processes and outcomes across national boundaries to improve our knowledge of these issues.

A third limitation is the tendency to ignore industry level outcomes; i.e., the collective level of analysis discussed later in the chapter. It is apparent from reading research published to date that, like alliances, R&D consortia concentrate in high technology settings. However, what has not received attention is the contribution that such consortia make to the international competitiveness of these industries. This is an area that holds great promise for future study of the impact of this collaborative arrangement on technological entrepreneurship.

5.3 University-Industry Alliances

For many years, research universities have been a fountainhead for significant technological breakthroughs (Roberts, 1991). Recently, however, policymakers and researchers have begun to examine the opportunities and challenges associated with exploiting their entrepreneurial potential. The growing commercial orientation of universities stems from the decreasing state and federal funding. However, a second stimulus has been the observation by existing businesses that many successful new organizations have emerged from the collaboration with research universities. Most notable are those firms that have emerged over the last few decades from institutions such as MIT and Stanford. Also, as noted earlier, universities themselves have become increasingly aware of the opportunities for new sources of funding through the commercialization of intellectual properties developed within their organizations. Three key themes of this emerging body of research are university spinouts, licensing arrangements, and cooperative industry-university alliances.

University spinouts offer a mechanism for the university to capitalize on its best scientific and technological innovations through the creation of a new firm (Nicolau and Birley, 2003).

As with any new operation, a university spinout faces challenges in acquiring necessary financial capital as well as management expertise. One challenge for these operations is that the original inventor of a technology may have little incentive to participate in the formation of a new firm. Further, the university may risk losing key research faculty to industry.

Increasingly, universities are attempting to develop links among technology transfer offices, university incubators or technology parks, and the science, engineering and business faculty to identify and exploit opportunities for technology commercialization through spinout firms. Research is necessary to compare the success rate of this model with that of non-spinout new ventures. This research should identify the unique obstacles that university spinouts face, and if they represent a significant barrier to the success of these firms.

Licensing represents a second theme in the industry-university collaboration research.

Rather than attempting to encourage firm formation directly, universities may seek to sell their intellectual property to the highest bidder. University licensing has accelerated since 1980 in a likely response to the funding challenges noted earlier. Although research has been limited, it provides evidence that patent effectiveness is an important factor in the subsequent success of licensing agreements (Shane, 2002). Patent effectiveness refers to the

degree in which a patent may be invented or successfully challenged. The more effective the patent, the more likely a university can attract a licensee who will successfully commercialize the invention and thus increase the chances that the university will profit from its intellectual property.

A third theme in the university-industry collaboration literature is the evolution of cooperative R&D consortia. Many of the R&D consortia studied and discussed previously also involve research universities. These universities donate resources including specialized facilities, and faculty and students to participate in what is typically pre-competitive collaborative research. In exchange, the university and faculty get access to new sources of funding and research ideas, and students have access to new job opportunities. Within this literature, there is evidence that a number of challenges must be overcome when promoting such direct cooperation between universities and firms. A major challenge, is the difference in cultures between business firms and universities. The incentives and constraints of university researchers diverge considerably from those of their industry counterparts. The need for speedy development, ownership and secrecy in industry is quite distinct from the need for academic purity, transparency, and dissemination of knowledge in a university setting. Research on balancing these two conflicting cultures tends to be prescriptive and atheoretical.

In general, the research on why firms join these consortia is well developed and is consistent with that previously discussed for R&D consortia. What is missing from the literature on university-industry consortia is a theoretical account of the technology transfer process. Given the rapid proliferation of various industry-university links, there is a need for further research into the licensing process, the creation and management of university spinouts, and the management of technology transfer through university-industry research consortia. Such research needs to go beyond single case analyses and also beyond static, variance explanation models to examine the underlying processes and factors influencing the successful and ongoing transfer of technology from universities to industry. Research should also seek to improve our appreciation of the benefits young high technology ventures gain from remaining closely affiliated with a university.

6. RESEARCH AT THE COLLECTIVE LEVEL OF ANALYSIS

Researchers have also explored important technology-based entrepreneurship issues that lie at the collective level of the analysis. As shown in Table 1, these issues fall into two broad strands. The first deals with industry-wide forces that influence technology based entrepreneurship. The second focuses on the role of networks in the technological entrepreneurial process. These two sets of issues are analyzed in turn below.

6.1 Collective Strategy

Researchers have examined the collective strategies new ventures use to gain legitimacy from powerful institutional stakeholders. Legitimacy is an important condition for the survival

of new organizations because it allows them to obtain resources inexpensively, bestows approval on their management and operations, and gives them credibility in dealing with various stakeholders.

In addition to studying strategies that can bestow legitimacy, researchers have also examined the strategies high technology entrepreneurs employ to influence the evolution of industry standards. These activities could be informal (e.g., contacting friends in high places) or formally coordinated (e.g., joining trade associations that lobby public policy makers). Informal and formal strategies are often used as complements, bringing pressures on public policy makers to favor industry participants. This is most evident when new standards are being considered and new ventures seek to influence regulations covering these standards. Other examples include influencing proposed tariffs on imports and exports in ways that reduce high technology new ventures' costs of operations. Another issue that usually galvanizes high technology entrepreneurs' energy is the subsidy granted by foreign governments to their companies as they internationalize their operations. Global competition is usually fierce in high technology industries and new ventures understand that through collective action they can shape public policy debates and recommendations.

Research on collective strategy and its effect on high technology entrepreneurship is limited. Important issues, therefore, must await future study. For example, when do high technology entrepreneurs use formal vs. informal influence tactics? How do they choose the causes for which they lobby publicly? How do lobbying efforts influence high technology entrepreneurs' quest for public credibility and legitimacy?

6.2 Networks

A large body of research has emerged over the past two decades on the role social, professional and industry networks in spurring the development and subsequent growth of new high technology firms (Freel, 2003). A recent review of this extensive literature appears in Hoang and Antonic (2003). Research shows that formal and informal networks are key sources of resources and information about opportunities in the market. Networks are also important for testing ideas informally, gaining competitive intelligence data inexpensively, identifying new customers, obtaining leads about potential alliance partners, and gaining access to various sources of funding such as venture capital (Aldrich and Zimmer, 1986; Burt, 1992; Saxenian, 1994; Uzzi, 1996). Research also shows that the locus of innovation in high technology industries has shifted from individual firms to networks of firms that collaborate formally and informally (Ahuja, 2000; George et al., 2002; Powell, Koput and Smith-Doerr, 1996). These networks include venture capitalists (Daunt, 1989; Florida and Smith, 1990; Streier and Greenwood, 1995), universities and research centers, other organizations within the same industry, and firms from other industries (Keil, 2002).

Researchers have also studied the effect of a firm's location within a network on its innovation activities, arguing that more centrally located firms are apt to gain access to more and perhaps superior information that can stimulate their innovation (Powell et al., 1996).

Likewise, researchers have explored the effect of the number of ties on a firm's innovation, proposing that more frequent ties to other organizations can enrich high technology firms' knowledge base and as a result innovation. These findings suggest that those firms that are

actively engaged with others in their networks are likely to acquire new and rich information that can fuel their growth by stimulating innovation. Coleman (1988) and his followers have posited that firms gain advantages by crossing the structural holes that exist within their networks. These holes arise from the specialization of firms, and connecting these holes can provide a source of new information about new opportunities that enhance organizational growth.

A key finding from network-related research is that high technology firms' economic performance is determined by their embeddedness in various networks. This embeddeness gives these firms knowledge that they cannot develop internally or acquire externally. Given the importance of organizational embeddedness, researchers have begun to investigate those factors that give companies locational advantage. Researchers have observed that new ventures cluster in close proximity, a process that has made it possible for them to acquire resources and build their value chain quickly (Appold, 1995).

Research has explored the effects of this clustering on high technology new firms' competitive advantages. Researchers seek to explain how and why these clusters emerge, thrive and decay. Researchers have also noted that, over time some clusters loose their competitive advantage and give way to other locations that rise to industry dominance.

Currently, the effect of these changes on the behavior of individual firms is not well understood.

Another issue that has received attention in past research is the notion of community of practice (Wade, 1995), where professional and personal ties bond the members of an industry and allow them to collaborate in ways that enhance their collective innovation. With the growth of the Silicon Valley and Route 128, a new norm has evolved where professionals from different companies frequently collaborate in solving common problems. Thus, software engineers from different and often competing companies collaborate to finish the development of a new program. These collaborative efforts arise from a sense of loyalty to the profession, not the employing companies. Problem solving in this case becomes a group activity and those who participate in this process rely on professional and personal norms of reciprocity.

They, too, expect to get help from other professionals when they encounter a complex problem. The growing reliance on communities of practice can determine the transfer of knowledge and learning within an industry.

7. IMPLICATIONS FOR FUTURE PRACTICE, PUBLIC POLICY AND FUTURE RESEARCH

Entrepreneurs, whether independent or corporate, are important agents of social, economic and technological progress. For *managers of technology-based companies,* our review highlights a need for a broader vision for the firm in order to succeed. This vision should center on developing multiple and varied capabilities. Even the most imaginative new ventures can not retain their market lead without assembling multiple capabilities. Our discussion also reminds executives of the need to look outside their own companies and build productive links with universities and other companies and gain the knowledge and skills necessary for capability building. Managers should bear in mind that different capabilities are necessary at different points in time. Consequently, managers of technology-based

companies need to re-examine the relationships they develop and ensure that they match their firm's needs for growth.

For *public policy makers,* our review suggests a need to provide the context within which entrepreneurs are willing to take the risks associated with new venture creation. It is also important to provide the right incentives that support entrepreneurial risk taking once the firm is in place. Policy makers need also to examine existing legal and political frameworks and ensure that they foster a willingness to collaborate, which is important for high technology new ventures' gaining access to the resources needed for capability development. Legal and political frameworks should also reflect the realities and challenges of global competitiveness.

Our analysis has already outlined multiple areas for *future research.* Looking at Table 1, it becomes evident that several methodological improvements are necessary. Our review also highlights some of the key areas that demand attention. Notably, greater attention to theory building is in order. Entrepreneurship research is fast approaching adolescence and theory building can enrich our understanding of the diverse issues being tackled today in the field. Also, attention to process variables is overdue. Indeed, this lack of attention to process variables has handicapped past research into technological entrepreneurship and made prior findings non-cumulative. It is legitimate to analyze the entrepreneur, the environment and the venture. But, progress could be made by studying the processes by which entrepreneurs, their environments and their ventures intersect as they influence the discovery and exploitation of emerging technologies.

8. CONCLUSION

Technological entrepreneurship is a fertile area of research. Scholars from as diverse fields as entrepreneurship, strategy, organizational theory, sociology, economics, and psychology have made valuable contributions to this fast growing area. Our review of prior research reinforces the importance of prior research findings, while outlining several opportunities for imaginative and productive scholarship in this area. We hope that our review will encourage interested scholars to give greater attention to theory and methods, thereby providing coherence to future findings on this important but complex topic.

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ENTREPRENEURSHIP IN LATE DEVELOPING COUNTRIES: WHAT IS UNIQUE ABOUT EAST ASIA?

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1. INTRODUCTION

The luster of East Asia's economic success wore off with Japan's hibernation in the "Lost Decade" of the 1990s and a region-wide financial crisis in 1997. It is, however, too soon to give up on East Asia's once shining star. Countries from Korea to Thailand and even Indonesia have made an impressive V-shaped comeback. Taiwan and Korea are both advancing fast into high-tech. Vietnam is quickly building modern basic industries. China is becoming a world economic power. Thus, by global standards, East Asia remains a region whose economic performance is outstanding.

Our question is what role the "entrepreneur" has played in this miracle. To clarify his point, we try to develop a general theory of entrepreneurship in economic development and hen examine the empirical regularities of East Asian entrepreneurship.

According to (Schumpeter, 1942), the tasks of the entrepreneur involve coming up with a new idea ("new" in the case of an entrepreneur from a developing country, to the country in question), coordinating the resources necessary to exploit it, implementing the resources to bring a product to market, and monitoring production. In an everyday use the term "entrepreneur" often has a connotation of a private individual and his or her start-up enterprises. Even in theory entrepreneurs typically represent the private individual, who, in the Walrasian framework, behaves as a price taker — it has no influence on price and produces a single product that is standard in terms of quality and characteristics. There is no product differentiation and hence no monopoly profits. Nor are there organizations. The Walrasian enterpreneur operates alone and embodies all the qualities that are necessary to compete in perfect markets.

But theoretically, and often practically, entrepreneurial functions can be performed by other players than a private individual. Organizations that entrepreneurs may create deviate from the price-taking single-product firm that figures in classical market theory. Even a government may be entrepreneurial. A government can own business firms, or it may influence the decision-making of private entrepreneurs by arranging macro- and micro-

economic environments. In trying to develop a theory of the entrepreneur in economic development, and applying that theory to East Asia, we thus consider three players in the markets: private individuals; organizations; and governments.

We examine how these players create or correct market failures. The market failure on which we concentrate is mostly related to technology, or knowledge. In market theory, technology is free and available to all firms. Firms' productivity, therefore, is the same. In reality, technology is tacit and proprietary. It is difficult to imitate or transfer from one firm to another. Productivity varies in the same industry among firms in different countries.

Perversely, therefore, a high-wage country may be globally more competitive in a labor-intensive industry than a low-wage country, which in theory has the comparative advantage.

Entrepreneurship in developing countries, therefore, is oriented towards acquiring and creating knowledge, a task for which free markets, individual entrepreneurs and single-product firms are not necessarily ideal.

2. ECONOMIC DEVELOPMENT AND ENTREPRENEURIAL THEORY

Economists regard a developing country as one with pervasive "market failures," or imperfect markets and unexploited externalities. But theorists are very conservative in the way in which such failures are supposed to be corrected. Certainly the government is not regarded as a qualified agent. Market theorists assume that the costs of government failure will always exceed the costs of market failure. Instead, the correction of market failures should be the sphere of private entrepreneurs. Market imperfections generate an innovative opportunity for a Schumpeterian entrepreneur.

In theory and reality, thus, entrepreneurs may have behaved very differently from what Walrasian theory prescribes, both in developed and developing economies. Organizations and the government have assumed active entrepreneurial roles either by correcting or creating market failures. But entrepreneurship has differed between developed and developing economies because of variations in their market imperfections and externalities.

In advanced economies, markets tend towards perfection in terms of the working of competitive market forces. Entrepreneurs seek to build monopoly power, which takes the form of investing in, for instance, large-scale plants, innovative technology, and brand names.

Technology in the form of genuinely new products and processes does not fall like manna from heaven, as theory assumes. It is the object of deliberate entrepreneurial effort and involves cooperation among government, universities and business in national innovation systems. Even if an individual invents a new product, its production and distribution typically involve rapid ramp-up such that the new technology is exploited by a large-scale firm. This firm earns monopoly rents. Its unique product thus creates a market imperfection. Entrepreneurs from advanced countries with globally new ideas may enjoy monopolistic returns for a long time period, as in the case of the software product segment dominated by Microsoft.

But eventually other firms enter the same product market and compete. Due to a large supply of entrepreneurs with skills, capital, and organizational capabilities, the market failures created by an innovator may be expected to be corrected fairly quickly in most cases. Thus, entrepreneurship in advanced economies involves a tendency domestically towards the rapid correction of market failures (Kirzner ,1973). This dynamics of the Schumpeterian mechanism

of creating market imperfections and the Kirznerian correction of them represents the fundamental operation of entrepreneurship in advanced economies.

In developing countries, however, the technology-cum-market failure created by the world's leading innovators cannot be replicated or imitated easily. Cutting-edge technology is tacit and hence, hard to copy (or it is patented and expensive to buy). This is especially so when a country's production and project execution skills are low, as they tend to be in a developing country. Thus, instead of correcting the markets of developing countries — which are highly imperfect in terms of skills, capital and products — entrepreneurship in advanced countries in the form of new products and processes leaves the markets of backward countries even more imperfect.

Because of low productivity and heavy risks, the developing world's high interest rates (by international standards) fail to attract capital from advanced countries (foreign direct investment or indirect investment tend to lag rather than lead economic development in latecomer countries[1]). Low wages initially fail to attract a transfer of production from developed to developing countries. As wages rise and interest rates fall in countries at the world frontier, the income gap with backward countries grows wider.

In addition to the serious imperfections in product markets developing economies also face acute imperfections in the labor markets. This is particularly true in the supply of entrepreneurial talent. Knowledge of markets and technology was concentrated in the hands of a few elites, as education initially did not diffuse to a large part of the population. This gap between the enormous demand for entrepreneurial activities and the limited supply of entrepreneurial human capital constitutes one of the basic troubles of backward economies.

The shortage of entrepreneurial talent thus was compensated by the deliberate and clever efforts in the use of those resource. Once the entrepreneurship is found it must be utilized in an organized form. Organized business groups emerge not only from the imperfect product markets but also from the efficient and effective use of entrepreneurial leadership. Wherever the entrepreneurial supply is available it is exploited for the maximum use. The government thus often became the source of entrepreneurship, as in the process of industrialization it certainly pools talented elites.

To catch up, the government and business, acting together in all latecomers (successful and unsuccessful), created even more imperfections in order to compete. In the case of East Asia:

> Policy interventions took many forms — targeted and subsidized credit to selected industries, low deposit rates and ceilings on borrowing rates to increase profits and retained earnings, protection of domestic import substitutes, subsidies to declining industries, the establishment and financial support of government banks, public investments in applied research, firm- and industry-specific export targets, development of export marketing institutions, and wide sharing of information between public and private sectors. Some industries were promoted while others were not (World Bank 1993, pp. 5-6).

Thus, whereas the development process in countries at the world technological frontier largely involves a process of correcting market failures, in countries behind the world frontier it involves creating market failures. The policy interventions mentioned above are all considered in neoclassical theory to create serious market imperfections. The very opposite happens globally. Innovations in advanced countries tend to create more market failures worldwide — developing countries lack more knowledge and generally become less desirable

venues for investment. Per contra, if entrepreneurs in developing countries succeed and enter world markets, joining the ranks of the world's great multinational firms, more competitors exist, and this increases global competition. Entrepreneurship here corrects market failures.

We now turn to the markets, institutions and government policies that account for East Asia's success. Given government intervention and pervasive market failures, East Asia's postwar miracle can be attributed prewar manufacturing experience, the type of such experience, and the nature of the region's control mechanisms over subsidies, as discussed below.

3. PREWAR MANUFACTURING EXPERIENCE

Some developing countries did not emerge out of World War II with their factories intact (many factories, for instance, were destroyed in Korea during World War II or the Korean War, while 400 or so manufacturing enterprises in Indonesia were ransacked by the Dutch as they fled Indonesian liberation forces)[2]. Despite the obsolescence or destruction of capital goods, however, a few developing countries had nonetheless acquired prewar "manufacturing experience". Such experience has no single definition but embraces a shift from mystical beliefs to rationalism[3], the existence of commercial laws and services, as well as production skills, organizational capabilities, and the remnants of firms.

Empirically, we measure prewar manufacturing experience by the share of manufacturing in GNP (as close to the end of World War II as data permit), as well as a diversification factor — a country with a very high share of its industrial output in a single industry (such as textiles in the case of Pakistan and Egypt or oil in the case of Venezuela) is not considered to have accumulated substantial manufacturing experience. Given these two criteria, twelve countries fit the bill. No country entered the orbit of modern world industry after World War II without manufacturing experience. Leap-frogging of other sorts may have occurred, but not this one. All countries with prewar manufacturing experience did not succeed (witness Argentina). But prewar manufacturing experience turns out to have been a necessary if not a sufficient condition for industrial development.

If one tries to explain variations among developing countries in manufacturing per capita in the 1990s by per capita income in the 1950s, the R^2 is only around .35. If, instead, one uses manufacturing output per capita in the 1950s, the R^2 is as much as .75 (Amsden, 2001).

Why does manufacturing experience matter?

Government postwar subsidies to business are more likely to lead to successful enterprise when there are experienced managers and workers available, including experienced managers in government with business experience. The more experience, the more private capital is also likely to flow to industry — the probability of making profits is greater in the presence of experience. This inflow reduces the burden on government to finance industry. Foreign capital may ultimately appear for the same reasons. The first foreign direct investment (FDI) to flow to developing countries flowed to countries with manufacturing experience.

Given our two criteria (share of manufacturing in GDP and diversification), the 12 developing countries which succeeded in accumulating manufacturing experience by the end of World War II were: Argentina, Brazil, Chile, Mexico, Turkey, India, China, Korea, Taiwan,[4] Malaysia, Indonesia and Thailand (Amsden, 2001).

These countries are located in the Middle East, South Asia, Latin America and Turkey. The largest number (6) are located in East Asia. Why the concentration of entrepreneurship in East Asia?

4. TYPE OF MANUFACTURING EXPERIENCE

Not only did success in industrialization among latecomers depend on prewar manufacturing experience. For this set of firms, in the specific historical context in which they operated, success in industrialization also depended on the type of manufacturing experience they acquired. The type of experience East Asia accumulated contributed to its entrepreneurship and rapid growth.

Three types of prewar manufacturing experience existed: pre-modern, emigre and colonial.

Pre-modern experience refers to the long-standing industry, usually in the service of a royal court or aristocracy, that over a long time period lent to the rise of specialized manufacturing activity and the decline of household self-sufficiency. Such experience characterized India (Royle, 1851), China (Chao, 1975), and the Ottoman Empire (Turkey) (Quataert, 1988). In the case of the Ottoman Empire, for example, the production of silk went back for at least a century (Quataert, 1983). Mexico also had a long-standing woolen industry located in Pueblo (Thomson, 1991). The problem with such experience is that it is hard to connect to modern industry. Mexico's traditional woolen obrajes, for example, produced not a single modern textile plant (Glade, 1982).

We will concentrate, therefore, on only two types of experience: emigre and colonial.

In principle, both diffuse know-how and mobilize capital. Emigre refers to the migration of individuals (later foreign firms) from more advanced economies to less advanced economies.

Emigres from the North Atlantic were the single source of manufacturing experience in Latin America. Colonial experience was irrelevant by the time of World War II because Latin American had ended its colonial rule by the early nineteenth century (even if "neo-colonialism" survived). Argentina acquired a metal-working sector, for example, through the migration of Italian artisans. Banking in the region originated from emigres from the US and Europe. Emigres were also important in the learning of some Asian countries, although not necessarily from the North Atlantic. Emigres from China to Indonesia, Malaysia, Taiwan and Thailand brought industrial experience with them and became the backbone of modern industry, as in Taiwan's textile industry.

5. DE-COLONIZATION

Nevertheless, the most important source of know-how and experience for Asia (East Asia and India) was colonial. In the case of colonial experience, not just individuals from the imperial power emigrate to the colonies. Through government promotion, firms also migrate to implement specific projects, both industrial and infrastructure (such as electric power plants in northern Korea). Government bureaucracies were reproduced for purposes of political control, so civil servants also migrated, and the institutions of governance were put into place (central banks, ministries of finance, etc). Arguably, for better or worse (worse

when the colony had no prewar manufacturing experience), colonial transfers of know-how tended to be more intense than emigre transfers of know-how, especially when the colonial form involved an organization rather than an individual (Wilkins, 1987), and especially when the colonizer was itself a learner (Japan), sharing problems in common with the colony.

Colonial transfers of capital, labor and know-how were sometimes motivated by geopolitics. In the 1930s, the Dutch belatedly attempted to industrialize Indonesia in order to ward off Japanese attack (Segers, 1987). As World War II approached, the Japanese accelerated industrial investments in Taiwan, to groom it as a bridgehead for Japanese advancement in Southeast Asia (Ho, 1984), and in Korea, to groom it as a bridgehead for Japanese aggression in Manchuria (Ahn, 1998) and (Eckert, 1996), which was partly regarded as an arsenal for war materiel.

Sometimes the transfer of manufacturing experience was motivated by profits. British firms invested in India (Bagchi, 1972) and Malaysia (Lindblad, 1998) solely to make money.

Big agency houses in both countries were often owners of a large number of firms, rather than a single enterprise Thailand's raw materials had long been an object of profit-making for Japanese companies (Suehiro, 1985) and (Ingram, 1971). Cement mills and shipyards in South Korea were owned by new Japanese zaibatsu (Park, 1999).

Three virtues of the colonial mode of technology transfer operated in the postwar period by comparison with the emigre mode. First, colonialism ended as the world became less tolerant of foreign rule (the US was interested in diluting the global power of England and France). De-colonization brought significant political and economic discontinuities, unlike the investments of emigres and foreign firms, which endured before and after the war without a break. De-colonization tended to increase popular demands for nationalism and greater egalitarianism, as well as kick out foreign investors. The result of social upheaval in China was a revolution. The result in Korea, Taiwan and parts of India was land reform.

A major consequence of land reform was greater income equality, especially in agriculture.

Previously, the best resources (land, minerals, water rights, etc), in the Ricardian sense, were concentrated in the hands of a few wealthy families. The wealth and human capital of these families remained bottled up in agriculture before the war. As these resources were redistributed, capital and second-generation educated people from the countryside began investing in industry. Land reform thus encouraged industrial entrepreneurship. Given differences in opportunity costs (it was more profitable in Latin America to invest in agro-industry than in manufacturing industry), the share of industry in GNP became much higher in East Asia than in Latin America (Amsden, 2001). Arguably, a greater share of manufacturing led to greater employment in (relatively) high-wage jobs, and a step towards higher value-added industry and capabilities in R&D. Politically, industrialization led to the rise of a middle class, with greater demands than otherwise for democratization.

Second, de-colonization typically included a transfer of ownership of business organizations from colonials to nationals. In China, as well as in Indonesia, foreign enterprises were expropriated. In Korea and Taiwan, colonial businesses fell into the hands of nationals (state and private) as the Japanese forces fled. In Malaysia, the largest British companies were bought by the government on the London Stock Exchange. In India, national companies successfully competed against foreign companies, which in any event were loath to invest

more given their perception of political instability under Indian government (Tomlinson, 1981). In Latin America, by contrast, the multinationals remained hegemonic, and constituted barriers to entry to national firms.

We haven't the space here to debate the virtues for economic development of foreign versus national ownership. Suffice it to say that in the four cases we've examined, entrepneurship, particularly the generation of a new idea and the adoption of a new way of doing something, tended to characterize national rather than foreign firms, which largely imitated the practices of their parent company without adaptation to local conditions (depending on the industry). In the Indian pharmaceutical industry, the time to market of a new drug became quicker for a national firm than for the local subsidiary of the multinational that invented the drug (Mourshed, 1999). Multinationals dominated industry in Singapore, but their ventures into R&D were largely a function of government promotion (Amsden, Tschang et al., 2001). In the dynamic, fast-growing Taiwan electronics industry, the share of foreign firms in exports fell from around 85 percent in the 1980s to around 7 percent in the 1990s, as most foreign firms (with the exception of Philips) failed to exploit new opportunities in electronics (Amsden and Chu, 2003). Joint ventures have become popular in China, but a local company (Legend) has managed to retain the largest market share in the highly competitive computer industry. Almost all industries in Korea are led by firms that are nationally owned.

By contrast, in countries with émigré experience, where the war brought no discontinuity in ownership or income re-distribution, foreign multinational firms tended to "crowd out" national enterprises. The Latin American automobile industry is a case in point. In Argentina, a national enterprise could not survive the competition of foreign auto makers, some of which had operated in Argentina since the 1930s (Cochran, 1962). Despite a huge struggle, Brazilian entrepreneurs in the automobile industry could at most become suppliers; all assemblers were foreign (Shapiro, 1991). Chile kept its auto industry open to all entrants, the consequence being too many investors in such a small country and the collapse of the industry altogether (Johnson, 1967). Prewar dependence on individual foreign émigrés (and later firms) for technology and capital made it hard for the rise of national entrepreneurship.

Third, colonial manufacturing experience provided a "role model", an intimate understanding of how another country worked, a country with more developed skills and organizations than a latecomer. The diverse origins of émigrés, by contrast, from the US to Europe, presented less of a model that could be intimately known, although ultimately American FDI in Latin America and migration from Latin America to the US created a de facto role model for Latin America in the form of the US.

Sometimes the "wrong" role model was chosen by a learner, meaning that the major characteristics of the teacher could not — or should not — be replicated by the learner. As a consequence, emulating the teacher did not put the learner closer to the world frontier.

This was probably true of Russian influence on Turkey and India. Arguably it was also the case with the US influence on Latin America, the premier émigré countries. The US, Argentina, Brazil and Mexico were all large, rich in raw materials and prone to high protective tariffs. But the US thrived on its technological capabilities while those of Latin America were never seriously nurtured (Alcorta and Peres, 1998).

East Asia, by contrast, benefited greatly from having Japan as its teacher, a country, like

many others in East Asia, with relatively few raw materials, high labor density, and a recent history of having to catch up in the presence of highly industrialized Western countries. The institutions and organizations that Japan had used with great success to industrialize were intimately known by its two colonies, Korea and Taiwan, as well as by China after initiating post-1978 a series of reforms. These countries methodically and systematically imitated Japan, from the structure of business enterprise (the zaibatsu) down to the width of the aisles separating different manufacturing functions in the automobile industry (for the diffusion of Japan's export promotion system, see (Amsden, 2001).

6. NATURE OF THE FIRM

Industrialization in latecomers meant diversification, or moving into one industry after another depending on entry costs (for technology, capital and skills). In virtually all latecomers with prewar manufacturing experience, and not just those in East Asia, the agent of diversification became the diversified business group, zaibatsu in Japan, grupo in Latin America, chaebol in South Korea, etc.. These groups tended to be family owned and professionally managed. They differed from the American or European conglomerate insofar as their subsidiaries did not represent merely a stand-alone financial investment. Instead, subsidiaries became organic parts of the group, and shared capital, inputs, managers and know-how with each other (Hikino and Amsden, 1994).

Business groups implemented a latecomer country's diversification plans; as an industry received protection and subsidized credit from the government, groups targeted that industry for entry. As multi-product entrepreneurs, they differed from the Walrasian specialized firm.

Some of their characteristics have been heavily criticized: cross-subsidiary financing (lending by one subsidiary to another) has been unpopular with the financial community because, if a subsidiary goes public, cross-financing makes it difficult to predict any one subsidiary's profits. Multi-product operations have also been faulted for the inefficiencies that are assumed to exist in the absence of specialization. Nevertheless, in the context of industrializing late, the diversified business group has exhibited several advantages, which would explain its predominance in latecomers of different size, culture, natural resource endowment, history and geographical region.

First, by diversifying again and again into different industries, business groups became good at diversifying itself. They acquired project execution capability, or a set of skills related to buying a core technology, implementing it, overseeing construction of a new plant, designing its layout, supervising start-up, trouble-shooting, etc. (Amsden and Hikino, 1994).

This capability enabled groups to enter new industries at low cost and with minimum delay when opportunity presented itself. Leading East Asian companies became especially good at diversification because the fast growth of their economies provided multiple opportunities to diversify and learn, and excellence in project execution then contributed to rapid growth.

Second, diversified business groups became hubs of learning, just like big businesses in advanced countries (Chandler Jr. and Hikino, 1997). They tended to be the first firms to hire professional managers (for India, see Agarwala, 1986). Managers were trained at the

group level and were then assigned to work in different subsidiaries, thereby spreading professionalism over many industries (as in the case of the Samsung chaebol). In some industries, especially automobiles and electronics, the groups transferred technology to their suppliers. Thus, the groups became key diffusers of modern technology at low cost.

Third, although small-scale firms are frequently a source of innovation and entrepreneurship in advanced economies, this is generally not the case in latecomer countries (Amsden, 2001), not even Taiwan, where the small-scale firm is (erroneously) believed to dominate high-tech industries such as electronics (Amsden and Chu, 2003). Market failures globally have been corrected by latecomers' large-scale firms. That is, in the few cases where latecomer companies have managed to establish a brand name and hold their own against a multinational — thereby increasing global competition and reducing global market failures — diversified business groups have tended to be involved. Two examples, both from Korea, are Samsung Electronics and Hyundai Motors.

Another example, from Taiwan, involves a specialized large-scale firm — Giant Bicycle. This is a company that benefited from an upsurge in foreign demand after the 1973 energy crisis, depended on imports of key parts (derailleurs, for example) from Japan, and relied on technical assistance from the government (Chu, 1997). Nevertheless, the importance of groups has risen over time in Taiwan. As indicated in Table 2, the share of groups' sales in GNP hovered around 30 percent from 1973 to 1986. Then, as the government liberalized the service sector, groups diversified into services and their share of GNP rose to as much as 54 percent in 1998. Even in Taiwan, therefore, entrepreneurship and groups — the antithesis of the Walrasian firm — go hand in hand.

7. STATE-OWNED ENTERPRISES

Orthodox market theory has nothing to say about ownership (private or public), but generally theorists regard state ownership as inimical to firm efficiency. This is because of a "soft budget constraint" (Kornai, 1992) and supposed political meddling, especially in hiring. In even in the fastest-growing latecomers, however, state ownership has been pervasive. Thus, two forms of state entrepreneurship have existed: the state as owner of an enterprise, and the state as allocator of resources to different industries and firms.

In the manufacturing sector of countries with prewar experience, state ownership has mainly operated in the petrochemical and steel industries. In most countries (Mexico, Brazil, Taiwan, etc.) the state was instrumental in building the downstream organizations that made the production of petrochemicals efficient. For Latin America, see (Cortes and Bocock, 1984). For Taiwan, see (Chu, 1994). In the Brazilian and Indian steel industries, some state-owned enterprises were highly efficient while others were hopeless, depending on the degree of direct political interference (Baer, 1969; Ramamurti, 1987 for Brazil and Lall, 1987; Ahluwalia, 1985 for India). In East Asia, however, state enterprises were important in industries besides petrochemicals and steel, especially China, Indonesia (Hill, 1996), and Taiwan. Sometimes they flourished in high-tech industries (Ramamurti, 1987), including the semiconductor industry of Taiwan (Mathews and Cho, 2000). Despite pressure to privatize from the US and the international organizations (eg., World Bank), and despite pronouncements

that the state-owned enterprise was dead in the West (Università L. Bocconi, 1996), they continue to play a major developmental role in some East Asian countries, not least of all China (Steinfeld, 1998).

In the case of China, as market reforms have progressed in the 1990s state bureaucrats have been spontaneously going into business on their departments' behalf. Many (but not necessarily all) of the individual departments setting up these business are best seen as "entrepreneurial" because they are engaged in direct, profit-seeking, risk-taking economic activities. State entrepreneurialism is adaptive, because it involves officials accepting markets and the state restructuring they bring. Its economic consequences are unclear, however, and it also creates problems of financial control, administrative discipline and inequality in public spending.

> State entrepreneurialism simultaneously reveals the difficulties and unpredictability of development, as well as the possibilities for innovation....(Duckett 2001, p. 33)

Thus, both firm structure and ownership have deviated in East Asia from the free market norm, without seriously hampering (and possibly highly encouraging) entrepreneurship.

8. MARKETS AND EAST ASIA'S CONTROL MECHANISM

As we have just seen, entrepreneurialism in latecomers with prewar experience emerged out of the market, business organizations and the government, although in all cases entrepreneurship went hand-in-hand with the creation of market failures and the repression of recognized forms of competition.

There are three recognized forms of competition: pure competition of the textbook variety; creative destruction, as proposed by Schumpeter (Schumpeter, 1942), and financial market discipline (Jensen, 2000). None of these competitive forms, however, would have worked in the third quarter of the last century, when developing countries were involved in a Big Push to raise incomes. Financial discipline, involving such practices as hostile takeover of a firm inefficiently managed, requires the equity shares of firms to be publicly traded and sophisticated financial markets. Neither existed in latecomers. Creative destruction, or the overthrow of monopolies by external innovations, was unlikely in latecomers if only because no firm in a latecomer country was likely to produce a state-of-the-art innovation.

As for perfect competition, or some facsimile thereof, typically if unleashed full-force, was likely to kill-off a new industry rather than cradle it. Despite lower wages in postwar Korea and Taiwan compared to Japan, for example, higher productivity in Japan's cotton textile industry made the Korean and Taiwan cotton textile industries uncompetitive at world prices. Initially, therefore, both Korea and Taiwan protected their textile industries and put up barriers against Japanese takeovers of textile firms. Only after textile production in Korea and Taiwan had acquired experience and had reduced costs, and Japanese wages had risen, did competition occur in the form of exports. Exporting, however, first required a product that was competitive, and a competitive product — even in the case of cotton textiles — required protection and subsidization (Amsden, 2001). Therefore, alternative forms of discipline were required in order to make government support to business work.

With the exception of Argentina, the governments of latecomers with prewar manufacturing experience created "control mechanisms" in an attempt to mimic competition and insure that subsidies would be used efficiently and for the purpose for which they were intended.

A control mechanism is a set of institutions (organizations and behavioral norms) that imposes discipline on economic behavior. In the case of the eleven latecomers with prewar manufacturing experience, it imposed monitorable performance standards in exchange for subsidies, although discipline took different forms and varied in degree. Among other forms of discipline, Korea tied exports to protection of the domestic market. Taiwan did as well but used private export cartels rather than government administrators to implement standards.

After reforms began in 1978, subsidized "technology enterprises" in China had to sell a certain number of new products to continue to receive special privileges (Lu, 1997). Thailand imposed varied standards in exchange for reductions in onerous taxes. The development banks of Brazil and Mexico tied their loans to various standards (Amsden, 2001).

Thus, East Asia grew faster than Latin America not because policies were very different, but because performance standards were different, including differences in the degree to which exporting was made a condition for receiving subsidized investment capital (as it originally was in Japan).

9. CONCLUSION

Economic development has changed the type and character of market failure. Greater competition as well as more complementarity have evolved.

In terms of the three categories we specified earlier — the market, organizations, and the government — each has changed, and many market failures have been corrected. Still, upgrading among latecomers, or their move into high-tech, high-skill industries, continues to involve the creation of market failures although of a different kind from those that were deliberately created by business and government to build mid-tech industries, including cotton textiles.

In terms of the market for entrepreneurs, it is expanding on the supply side, as is the market for skilled engineers and workers. Entrepreneurship of the single, specialization-firm variety is being "crowded-in" by diversified business groups. Small entrepreneurs that are innovative have begun to make an appearance under the shadow of big business (in Taiwan, some venture capitalists estimate that as many as 75 percent of new, high-tech start-ups are connected in one way or another with large-scale firms (Amsden and Chu, 2003).

The government has begun to intervene heavily in high-tech industry. But whereas before, in the case of mid-tech, it used protection as a major tool to give firms a learning period, protection is no longer a viable instrument (although in the case of Taiwan's high-tech services, such as telecommunications, national firms were given a head-start over foreign firms). Instead, government builds high-tech industries by doing joint-research with the private sector, incubating start-ups, creating science parks with subsidized services for high tech industry, and creating state-owned enterprises such as the Taiwan Semiconductor Manufacturing Company, possibly world's most efficient foundry.

Thus, a new dynamic characterizes the entry into high-tech by latecomers, but the pattern of creating and then correcting market failures still prevails.

NOTES

[1]Amsden (2001), ch. 3

[2]For Korea, see Eckert (1996). For Indonesia, see Lindblad (1996) and Lindblad (1998).

[3] See Geertz (1963) for the social underpinnings of a modern industrial economy.

[4]Most of Taiwan's "prewar" experience took the form of emigration of entrepreneurs largely from Shanghai at the time of the Chinese Revolution in the late 1940s. Thailand had the least amount of prewar experience but in the 1930s, collaborated on industrial projects with Japan.

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ENTREPRENEURSHIP IN SCANDINAVIA: BRIDGING INDIVIDUALISM AND COLLECTIVISM

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1. INTRODUCTION

The Scandinavian countries - besides Sweden, Denmark, Norway and Finland, also Iceland, the Faroes and Greenland - are usually presented as very homogenous, nationally as well as when compared with one another. A possible reason for this homogeneity is that these countries, in addition to their geographical proximity, have colonised each other. Finland was part of Sweden until the beginning of the 19th century. After having lost Finland to Russia in 1809 after a war, Sweden entered an alliance with Norway that lasted for about a hundred years. Until then Denmark had ruled in Norway, in the Middle Ages also in Sweden.

Hofstede (1980) in his seminal study on work-related values also reports very similar findings from Sweden, Denmark, Norway and Finland. As a matter of fact his research places Scandinavian culture quite close to North American, with the difference that the Scandinavians have adopted more feminine values. After the Second World War the Scandinavian countries emerged into advanced welfare economies. A huge public sector and, especially in the case of Sweden, a number of large corporations managed to create wealth and economic progress that lasted well into the 1980s. Because of this there was not much need either for an active small-business sector, or for an offensive entrepreneurship policy. Such issues were instead integrated into regional policy, which is very elaborate in Sweden, Norway and Finland because of their huge and sparsely populated territories.

The political power in the Scandinavian countries, possibly with the exception of Norway, has for centuries been centralised. A possible reason for this is that few wars have taken place on Scandinavian ground in modern times and therefore the national boundaries have remained stable.

The Scandinavian countries in the 20th century all developed corporatist regimes (Johannisson, 1987). That is, alliances including the state, the large corporations, and the trade unions created highly regulated societies that did not leave much space for individual initiatives. A wage-earner culture has dominated the Scandinavian context since the 20th century, enforced by strong popular movements in all its member states. The independent way of life, epitomised by the small family business, has mainly been associated with petite bourgeoisie.

This sketchy historical account of the Scandinavian countries as potential arenas for

entrepreneurship, however, disregards some recent and important changes and associated shifts in national characteristics. First, the presumably homogeneous national settings have over the last 50 years, and during the last decade in particular, become ethnically more diverse. Every fifth Swede, for instance, is a first- or second-generation immigrant. Second, natural endowments as well as institutional changes have driven the countries quite apart economically. Sweden, the 'Big Brother' in the Scandinavian family, has lost its position as an exemplar welfare country. At the beginning of this millennium Norway is prospering on its oil, Finland on Nokia and Denmark on an internationalised and differentiated economy.

Third, following in Denmark's footsteps, Finland and Sweden have become members of the European Union. Norway has not joined the union, probably because of a well-developed nationalism supported by strong local communities.

Considering these shared spatial and institutional conditions for small business and entrepreneurship, the Scandinavian countries have adopted a similar public-policy approach.

The handshake between top-down regionalisation and bottom-up regionalism. (Cooke and Morgan, 1998) has been encouraged by politically and financially strong regional and local municipalities. While the regional dimension stands out, the conditions in the Scandinavian countries, however, do not differ very much from European standards with respect to the general political conditions for launching a career as an independent business person.

This brief introduction to the Scandinavian scene suggests that its member states do not take full advantage of a cultural and institutional setting that according to received knowledge should produce a strong civic society, in turn benefiting new-business creation and entrepreneurship generally (Putnam, 1993). This calls for a review of the entrepreneurial phenomenon from a collectivist perspective (Section 2). In the third section of the paper the regional dimension of promoting entrepreneurship in the Scandinavian context is elaborated upon. A general discussion is supplemented with illustrations from the Växjö region in Sweden. Section 4 offers a contribution to a discussion concerning what strategies the Scandinavian countries may adopt in order to jointly regain the position as leading welfare states.

2. ENTREPRENEURSHIP AS A COLLECTIVE PHENOMENON[1]

2.1 Entrepreneurship - Individual and Collective

The general image of entrepreneurship and small business, whether as new venturing or as a well-established small-scale family business, is a one-person effort with one business unit as the 'only' achievement. Living through the founding of one firm will suffice to satisfy most founders' urge to demonstrate independence and the ability to create. Besides, it usually takes about a generation to build a successful medium-sized business. In this perspective faster and further growth, let alone multiple firm ownership, may even be dysfunctional, considering that to advance venturing will increase the dependence on different resource providers and consequently reduce independence. Nevertheless some entrepreneurs initiate several ventures and sometimes entrepreneurship originates in the joint effort of many.

In an increasingly turbulent networked economy, ventures like products have shorter life cycles, which means that continued entrepreneurship calls for repeated start-ups in order to

combine into a life-long entrepreneurial career. This suggests that the entrepreneur/owner-manager, not the individual venture, should be focused on in research. We want to complement this perspective on individual multi-venturing with a collective view.

The notion of collective we have in mind relates to Tönnies notion of 'Gemeinschaft' and the Krapotkinian image of 'mutual aid' and solidarity. These images point at the direct interaction between members of the collective. We thus propose that the ability to build and exploit social resources creates a platform for offensive venturing. All economic activity is socially embedded (e.g. Granovetter, 1985; Uzzi, 1997; Johannisson et al., 2002). The benefits of such embedding are especially well demonstrated in the literature on industrial districts and associated phenomena. Research concerning ethnic enterprise makes the role of the social community as a platform for venturing obvious (e.g. Light and Gold, 2000). Social and economic forces thus reinforce each other in the venturing process.

Collective forms of entrepreneurship may differ with respect to e.g. governance structure (hierarchy/networks/standards (routines), the strength and/or formalisation of the ties between units, the fuzziness of the boundaries of the collective, and the importance of physical and social proximity. Structuring different images of collective entrepreneurship, two distinctions stand out in our mind: that between an *individual* and a *collective agency* and that between *calculated* (economic) and *social commitment* as a basis for involvement. Social commitment based on shared values and/or affection, may be as instrumental as calculated commitment in the venturing process. In Section 2.2 we provide different images of collective entrepreneurship along these two dimensions. In Section 2.3 entrepreneurship is associated with the context of the venturing rather than with individual entrepreneurs and their projects.

2. 2 Images of Collective Entrepreneurship

Here we will provide some empirical expressions of collective entrepreneurship.These examples are by no means exhaustive. However, we think that they provide a reasonably broad set of illustrations and should therefore convince the reader that it is relevant to present the entrepreneurial phenomenon as enacted collective socio-economic action.

Firms emerging in and out of personal networks. Over the last two decades the network metaphor has invaded the social sciences, obtaining almost a paradigmatic status. It is now recognised that *personal* networking, i.e. between individuals, in addition to inter-organisational networking, is pivotal to business development in general and entrepreneurial venturing in particular (Johannisson and Mönsted, 1997). Personal networking is especially important in entrepreneurial venturing, since it extends individual ambitions to a collective effort, thereby enhancing the entrepreneur's self-image, i.e. identity and self-confidence. The mutual trust carried by personal networks mediates human as well as financial capital and brings legitimacy to the emerging business. As a strategic resource the personal network creates a learning context for both the entrepreneur personally and her/his firm. Persistent and frequent (inter)action helps the entrepreneur to craft and control both the venture and the environment (e.g. Carter et al., 1996; Sarasvathi, 2001). It is easy to imagine how a prospective entrepreneur tests her/his venture concept on confidants in the personal network, whether family members, friends, or professional acquaintances. Some of these persons will contribute

more substantively with needed resources as the venture materialises. In each venture only part of the personal network becomes internalised (as employees), leaving most confidants as an outside reservoir. This 'personal community' (Wellman, et al., 1988) provides a base for further venturing, (c.f. Johannisson, 1992, 2000).

Family business. Most firms, new as well as established ones, are family businesses, i.e. they are operated by and for families. Several researchers point out that the social and business systems overlap in the family business, (see Brunåker, 1997) for an overview.

Obviously the family business is an arena where social concerns heavily influence the way in which the business activity is organised and operated. A paternalistic clan structure (Leimu, 1985) combines hierarchical control with brotherhood on the shop floor as well as with strategymaking at the dinner table. Family life and business life as ideologies, including managerial as well as entrepreneurial ideals, create tensions that are conducive to organisational vitality (Johannisson, 2002).

Partnership. Partnership in entrepreneurial contexts is today as much associated with the teaming up of individuals for venturing as of established firms. As pointed out earlier by Reich (1987) the venturing process is so complex and challenging that individuals with different competencies must be brought together. Interrelated, well-calibrated dyadic relationships constitute the successful partnership (Bouwen and Steyaert, 1990; Watson et al., 1995). Although the social interaction between partners cannot itself explain economic performance, it is considered to be indispensable for venture viability (Lechler, 2001). Today the strategic alliance has also become a buzzword for joint inter-organisational efforts. Such partnerships are either triggered by a mutual need to control the 'partner' in order to reduce uncertainty (Klein Woolthuis, 1999) or adopted as a way to jointly exploit business opportunities. The notion of partnership is often extended to include small firms working closely together with customers and suppliers in order to create and market new products and processes (Larson, 1992).

Co-operatives. The co-operative is the most visible collective business form with a special formal structure offering joint ownership and control. However, as a formal doublehierarchical structure (the shop-floor personnel on the board govern the CEO and (s)he in turn manages the shop-floor personnel) the co-operative accommodates complex and rigid decision-making processes. As much as these structural features may secure broad and persistent commitment, they may hamper the need for spontaneous action and structural adaptation. In regions where co-operatives appear as the dominant form and where further societal structures adopt similar organising principles, e.g. the case in Mondragon in the Basque region in Spain, a comprehensive business and societal context is created, which is congenial to the co-operative (e.g. Benton, 1992). In Scandinavia the co-operative movement has been very important for the development of primary industries but there are few workers' co-operatives e.g. in the manufacturing industry. In the 1980s the co-operative was generally recommended as a feasible collective form for firms and communities needing reconstruction. Also, with a shrinking and decentralised public sector in the 1990s a huge number of neo-co-operatives were created, e.g. in Sweden. Bridging the private and public sectors, these co-operatives enforce an emergent social economy and non-profit sector where entrepreneurial drive and collective concern combine (Lindström and Wijkström, 1997).

Franchising. Franchise constructs offer the franchisee a shortcut to a business career and the franchiser an amplifier of the market penetration capacity. By design the franchising system is a hierarchical and centralised structure. However, franchisees may very well establish horizontal ties to peers creating a 'shadow system' that not only reflects internal politics but may vitalise the system as a whole by supplementing and challenging the formal structure, cf. Stacey 1996. Thus the franchising system, itself enacting a joint and systematic branding strategy, may also invite to local collective action to improve the conditions for individual franchisees/entrepreneurs. The benefits and drawbacks of franchising as a venturing strategy are continuously debated, both from the point of view of the franchiser (e.g. Alon, 2001) as well as that of the franchisee (e.g. Brodie et al., 2002).

Virtual organisations. In today's network and informational society the traditional formal/legal demarcation of the firm as an economic unit is challenged. Well-known trademarks are often only a facade behind which there are a number of firms, most of them anonymous, which jointly materialise the promises carried by the brand. Advanced information and communication technology is then needed to make one organisation of all the contributors (Barnatt, 1995).

Such an organisation is addressed as virtual since its substance remains with the partners, usually orchestrated by a leading firm. Borch (1999), contrasting bureaucratic and virtual organisations, presents the latter as a flat and participatory structure encouraging initiatives from all involved, employees as well as external partners. Communication is rich and unbounded. Rather than formal contracts, relational contracting dominates business operations.

Extrapreneurship. Extrapreneurship is a venturing strategy implying that the employee, encouraged by her/his employer, creates a concerted spinoff replacing the employment contract with a business agreement (Johnsson and Hägg, 1987). It appears as a safe - and thus feasible in the Scandinavian setting! - venturing strategy for employees with competencies that are recognised by both the (former) employer and the external market. This venturing strategy is supposed to be rational from the point of view of each party. The former employer still has access to the former employee's unique competencies, but with greater flexibility and less responsibility. Since the former employee, now a novice entrepreneur, has a committed customer from the very start, the liabilities of newness are reduced. Associated legitimacy can be used to attract further potential customers.

Shopfloor entrepreneurship - self-organising groups and teams. Sweden and other Scandinavian countries have a long tradition of self-organising in groups on the shopfloor (in contrast to intrapreneurship (see below) that usually focuses on middle-management).

To a great extent these organising efforts reflect the enacted workplace democracy that is the result of a traditionally high degree of unionisation in Scandinavia. Influence, however achieved, may trigger entrepreneurial action. The empowerment of the personnel through managerial measures has been the American way of creating a corporate entrepreneurial spirit, emphasised by Kanter (1983) but originally brought up by Burns and Stalker (1961). In a recent Swedish study, Forslund (2002) makes a systematic account of the barriers to shopfloor entrepreneurship. He concludes that barriers to shopfloor entrepreneurship often originate in misconceptions of entrepreneurship among the management as well as the employees.

Entrepreneurs as creating new styles of living. The images of entrepreneurship presented so far are collective as regards the way of initiating and organising the production process, which in turn is assumed to penetrate the market as an arena for individual customers. If, however, entrepreneurship is associated with the creation of new ways, or styles, of living, the collective dimension rather concerns the outcome of entrepreneurial processes. Spinosa et al., (1997) suggest that the ultimate function of the entrepreneur is to change the world as reflected in human values, sense-making and behavioural norms. In this perspective Henry Ford's entrepreneurship was not mainly reflected in the systematic use of the assembly line for industrial production but in its effect on society in terms of providing reasonable inexpensive cars that made the American people mobile (Hjorth et al., 2003).

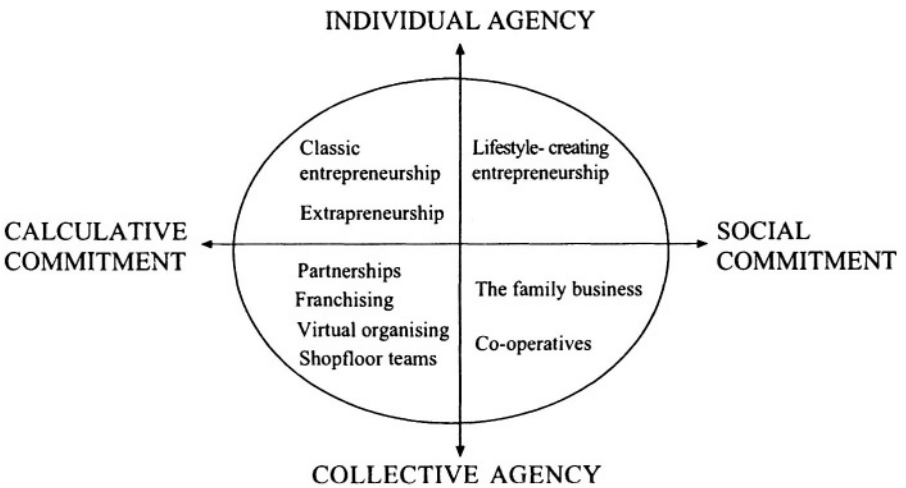

Figure 1. Structuring Collective Entrepreneurship - Subject and Commitment

In Figure 1 the two dimensions 'agency' and 'commitment' are used to position the different empirical enactments of collective entrepreneurship proposed above (the image of new ventures as emerging out of personal networks has as an illustration however been replaced by the positioning of the 'classic' entrepreneur). The acting subject may, ideally, be the individual with her/his personal interests or the collective as a concerted whole. Commitment may in principle be either calculative or social, based on self-interest and shared values/mutual sympathy, respectively.

2.3. Building an Organisational/Societal Context for Entrepreneurship

The logic of Figure 1 is that a munificent societal arena and a functioning market offer a point

of departure for individual and collective venturing. The notion of entrepreneurship as a collective may also refer to initiatives taken by individuals to create settings to which other persons are invited to carry out their entrepreneurial projects. Entrepreneurs in developing (national) settings, such as third world countries and reformed Europe, in addition to their own commercial venturing activities, have to engage in the hands-on building of institutions to provide for a context that offers a minimum of trust and needed real services. Such institutions include, for instance, trade and small-business organisations ,which in turn can establish their own rules and lobby for the enactment of new legal frameworks for organising, e.g. franchising systems. In the language used to construct Figure 1 this means a form of collective entrepreneurship that is not associated with any of the four quadrants but *refers to the (oval) surface as a whole.* Such collective efforts aim at building a context for entrepreneurial processes, themselves either originating in individual initiatives or being joint efforts.

Corporate entrepreneurship/Intrapreneurship. Corporate entrepreneurship is a concept associated with internal venturing within (usually) a large corporation, but may include corporate strategy-making (Stopford and Baden-Fuller, 1994). The 'intrapreneur', operating a quasi-independent venture within the corporation as an arena for entrepreneurship, is expected to team up with, for instance, mentors who have the influence needed to release corporate resources for the venturing process by tearing down barriers and 'open doors' (see for example Pinchot, 1985). Nevertheless, the very idea of intrapreneurship contains a contradiction: the intrapreneur, assumed to be driven by a need for independence, is only offered limited freedom within the formal corporate structure. Thus the intrapreneur may as much perceive the formal corporate context as a prison as seeing it as a container of resources for enacting opportunities. Ideally, though, corporate entrepreneurship and intrapreneurship are based on mutual dependence, a symbiosis between the corporation and the individual, i.e. it is genetically collective.

Intellectual Entrepreneurship. In some societal contexts the rules of the market game must be enacted before core entrepreneurial activities can be initiated. Then there is a call for the critical mind and broad knowledge base that we associate with intellectuals, subjects who already have the same need for integrity as entrepreneurs. Johannisson et al. (1999) have introduced the notion of the 'intellectual entrepreneur' to depict those people who mobilise their intellectual capabilities to launch an entrepreneurial career. Their comparative case study of such entrepreneurs in Poland, the USA, and Sweden indicates that intellectual entrepreneurs are much more frequent, and also more needed, in recently reformed Poland than in the two other welfare states. Intellectual entrepreneurs use their influence and personal networks both as a means for crafting an appropriate environment for their ventures and to advance their personal learning. In contrast to 'academic' entrepreneurs, i.e. individuals who exploit their scientific, however often narrow, knowledge base commercially, intellectual entrepreneurs focus on networking and creative organising in their venturing.

Community Entrepreneurship. Elsewhere we have introduced the notion of the 'community entrepreneur' to include people who use personal networking to mobilise internal as well as external resources to promote local venturing processes (Johannisson and Nilsson, 1989).

There may be several reasons for the increasing interest in this particular field of entrepreneurship: the awareness of the importance of the general social embeddedness of economic activity, the resurgence of local and regional perspectives on economic development (Stöhr, 1990; Storper, 1995), and an increasing concern for the moral dimension of business operations. Relating to the terminology introduced by Putnam (1993), community (or social) entrepreneurs are those who build and use social capital in a locality. Since the image of the community entrepreneur has emerged in a Western context, he/she is usually associated with mobilising for economic development in peripheral regions, which are widespread in Scandinavia, for instance. Henton and associates (1997) have introduced in the US context the similar notion of 'civic entrepreneurs' to whom are ascribed five common traits (p.34): ' [They] see opportunity in the new economy; possess an entrepreneurial personality; provide collaborative leadership to connect the economy and the community, are motivated by broad,enlightened, long-term interests; work in teams, playing complementary roles'.

The industrial district. For a number of reasons we will elaborate a little more on the industrial district as the materialisation of collective entrepreneurship. The image of the industrial district that I have in mind is close to that of Becattini (1990:38): 'a socio-territorial entity which is characterised by the active presence of both a community of people and a population of firms in one naturally and historically bounded area'. First, in the industrial district entrepreneurship is genencally associated with the territory as a socio-economic whole, i.e. not with individual firms or separate institutions. The dominant economic activity is carried out by traditional family businesses, the majority of which have little interest and/or ability to grow. That is, the individual firms are seldom entrepreneurial. Second, dense and 'lateral' information networks make the community transparent to all its members. Third, the intricate social embeddedness of business activity, which means shared identity and experiences as well as good will with respect to supporting others, enforces trust and mutual learning.

Fourth, a mature industrial district has the self-organising capabilities needed to maintain viability and growth potential, i.e. entrepreneurial processes are spontaneously initiated and maintained as an outcome of intense interaction.

There is much evidence that the spatial clustering of small firms has generated wealth, in Europe in general (see e.g. Piore and Sabel, 1984; Pyke et al., 1990) as well as in the Scandinavian countries (e.g. Illeris, 1992; Karlsson and Larsson, 1993; Isaksen, 1994; Johannisson, et al., 1994, 2002 and Maskell et al., 1998). In an increasingly global and networked economy 'industrial districts', nowadays more often (ad)dressed as subsets of spatial 'clusters', which also cover 'innovation systems' and 'learning regions', seem to remain relevant. The paradoxical fact that increasingly global competition calls for local collaboration reflects in our mind the genuinely collective entrepreneurial and learning capacity of the industrial district. The most prominent Swedish industrial district, Gnosjö in the southern part of the country, has about 80,000 inhabitants and 1,500 manufacturing firms. Gnosjö was the only region where employment increased between 1987 and 1994, and in the 1990s Gnosjö's economic development outperformed that of the national capital, Stockholm. At the beginning of the new millennium the small firms in the Gnosjö region reported the highest average profitability in Sweden.

The industrial district provides an ideal setting for small owner-managers in their collective enactment of entrepreneurial processes. First, shared tacit local knowledge and

individual personal integrity are both recognised. Second, the narrow knowledge base in the individual small family business is enriched by way of an everyday dialogue with peers, encouraging learning by interacting in addition to learning by doing and using. Third, due to dense local networking, most individual global relations become a collective asset.

Fourth, considering that doing business is a way of life, i.e. a cultural feature, learning and the development of competencies are closely integrated with ongoing societal and business activities.

3. REGIONAL APPROACHES TO ENTREPRENEURSHIP PROMOTION

Throughout this paper we have argued that the regional dimension of entrepreneurship is crucial in the Scandinavian setting. This does not mean that conclusive findings concerning regional determinants of new business creation can be provided. Johannisson (1993) used four different models to explain regional variations in new-firm creation in Sweden. The 'market model' proposes that demand is the major explanatory factor, the 'resource model' the availability of economic and non-economic production factors, the 'milieu model' access to 'cultural capital' in terms of the portion of cultural workers in the workforce and immigrants in the population. The fourth 'structural model' reflects the turbulence caused by industry restructuring that the region experiences. The market model was the most efficient, but all the models could satisfactorily (in 60% of the cases or more) explain the variations in regional business start-ups. This suggests that the local setting is in many respects important to emergent firms in Sweden as a Scandinavian setting. This assumption is confirmed when identifying the location of the core of the personal network that nascent and new entrepreneurs are building in Sweden: 80% of the network partners live within one hour's drive by car (Johannisson, 2000).

Adding to what has been said before, these findings suggest that the support of entrepreneurship should be locally or regionally organised. A regional implementation structure for industrial policy is also well established in all Scandinavian countries with only small variations with respect to ownership, authority and services provided. In the 1990s this regional structure for general support was enforced in Sweden through the creation of about 20 industrial development centres. Jointly owned by the local business community and the regional unions, these centres provide small firms with tailor-made competencies, combining formal knowledge and localised tacit expertise (Ennals and Gustavsen, 1999).

Besides offering their own training programmes and consulting services, the industrial development centres operate as bridges between the local businesses and different national competence centres such as universities and applied-research institutes.

Considering that all the Scandinavian countries in terms of their population are small nations, their university systems are elaborate and widely distributed geographically. A considerable share of their research is made on behalf of regional authorities and organisations, not the least in the field of (small) business development. In both Denmark and Sweden national programmes, albeit regionally organised, have recently been launched in order to mobilise university competencies for the training of small-business owner-managers.

In Sweden universities, besides their missions as centres for research and academic

teaching, are by law expected to be actively involved in the regional community, especially its small businesses. The science parks created in the 1980s in the vicinity of universities can, in retrospect, be considered as forerunners of this general development. This means that most Swedish universities have several liaison units aiming at bringing together entrepreneurs in need of support/advice and competent university representatives. The outcome of such co-operation is to a great extent dependent on the local initiative and on concerted action.

One of the bestknown examples of successful co-operation between university and region is Oulu in Northern Finland.

For more than a quarter of a century Växjö University in Southern Sweden has been teaching Small-Business Management and Entrepreneurship. Considering that entrepreneurs themselves focus on the dialogue between action and vision, the original programme aimed at complementing the entrepreneurs' competencies with planning skills. The students were offered a broad two-year small-business management training experience including weekly internships in small regional firms. With the changing attitude to entrepreneurship in the 1990s the programme, then a full Master programme beginning with two years of general management training, changed its focus and bravely included the ambition to make the students more entrepreneurial themselves. The harsh experience gained was that the students, because of their previous management indoctrination, were not able to re-orient towards an entrepreneurial outlook and action repertoire. The programme was closed.

Today Växjö University provides, for instance, a special fulltime three-year programme in Enterprising and Business Development and runs a compulsory one-month course unit within the general full-time MBA programme. Both the programme and the course include internships. The students in the full programme co-operate with small as well as large firms.

Another unique feature is its integrated multi-disciplinary pedagogical model. It aims at training the students to become entrepreneurial project leaders. The compulsory course unit brings the students in groups of three to emerging small firms. There the students are expected to identify the challenges that the nascent or still inexperienced entrepreneur faces, structure the challenges within a business-plan framework and select one issue for an in-depth inquiry. The findings of the 'junior consultants' are reported by the students both to the (would-be) entrepreneur and in class at the university. Continuous course evaluations reveal that the course is appreciated by both the students and the (nascent) entrepreneurs as well as by those regional agencies that help the university to identify and select partner firms.

In Figure 2 our understanding of what constitutes quality in any academic setting is presented. The *relations* between research, education and community dialogue contain the key to the success of the university as a high-quality contributor to regional development.

While most universities have a great concern for high-quality research and/or education and some (in Europe) pay attention to their stakeholders in society, few practise an integrated approach. The majority are more concerned with how the scientific production is received by the academic community, how educational programmes are ranked nationally and how much money research for the (business) community generates.

It would be too pretentious to argue that Växjö University at large has achieved a perfect fit between the three tasks, but within the field of entrepreneurship systematic attempts have certainly been made. Thus, the relation between research and education is nurtured by doctoral programmes, local, national as well as international, and the participants from Växjö

university are expected to teach undergraduates, bringing them to the research frontier.

Research feeds into the community dialogue when researchers carry out interactive research in the region or make their findings intelligible to everybody by publishing them in the regional media. The student internships make the students into active contributors to the community dialogue , which can easily be amplified by way of further projects. In 2002, university students studying entrepreneurship became mentors for high school students involved in programmes on enterprising.

Figure 2. Academic Quality - Integrating Research, Education and Community Dialogue

4. PROSPECTS FOR SCANDINAVIAN ENTREPRENEURSHIP IN A NETWORKED WORLD

In spite of, or because of, their attachment to place, Scandinavian entrepreneurs for a number of reasons seem to be able to cope with an increasingly complex and networked global society. First, since the entrepreneurs work within small economies they are used to operating outside both their local/regional and national boundaries. Second, all firms, even the small ones, are used to networking in order to gain access to information and resources, not only from commercial partners but also from authorities, organisations and further representatives of the Scandinavian corporatist setting. Located in not only high-trust but also high-cost economies, Scandinavian firms have been able to focus on their core business and enhance their competitive strengths by outsourcing. Thus, the combination of a high-trust and a high-cost context has made collaboration between firms a generic feature of Scandinavian entrepreneurship. The spatial clustering of firms enforces the cost-reducing and learning benefits of co-operation. Sometimes, as in the case of the Danish furniture industry, regional

concentration has created such dynamism that it has expanded considerably, while this industry in most other high-cost countries (Maskell et al., 1998) has declined. In Norway, firms in the primary fishing industry combine local and virtual structures to take on global challenges (Borch, 1999). Generally, Scandinavian firms seem to be able to take advantage of an elaborate local platform when approaching global markets. This suggests the 'glocal' (*glo*bal and lo*cal*) strategy as a generically Scandinavian one.

Collaboration between entrepreneurs, whether spontaneous or planned, short-term or long-term, means practising both individualism and collectivism. Entrepreneurs take care of their integrity; that concern once made most of them become independent businesspersons in the first place. However, once established, entrepreneurs realise the need to collaborate.

By building personal networks, i.e. networks where they represent both themselves and their firms and where the relations are co-created by themselves and their partners, entrepreneurs can cope with the paradox of having both an individualist and a collectivist outlook. Such personal networking is a general feature of entrepreneurship, only especially enforced in the Scandinavian context.

While on one hand inviting to entrepreneurship, the social and cultural legacy of the Scandinavian countries as early welfare economies has generated little pressure for individual initiative. The existing entrepreneurial energy has instead been channelled into democratic and popular movements and leisure activities (Baumol, 1996). However, the increasing general importance of the social economy and the expansive Swedish music industry suggest that the national entrepreneurial energy is now also used for economic activities. Since such a transition is a matter of change in basic values and beliefs there are, however, still many obstacles to overcome. The notion of the 'humanistic entrepreneur', i.e. a business-starter trained in the humanities, is a typical Scandinavian (Danish) invention (Kupferberg, 1998).

It highlights the agony that may hit people who during their primary and secondary socialisation into society never experienced entrepreneurship.

As indicated, 'community entrepreneurship' means focusing on the territorial context as an arena for (collective) entrepreneurship. When focusing on the community context, social forces include a strong commitment to place. Such an identity may be further enforced by way of 'cultural entrepreneurship', i.e. the staging of musical festivals, for instance, with the joint mission to create attractiveness and stimulate local economic development (Spilling, 1991). With the emergence of the experience economy, such venturing, often implying broad alliances, has become increasingly relevant in the Scandinavian countries. Community entrepreneurship, as well as cultural entrepreneurship, obviously mobilises collective entrepreneurial forces by explicitly bridging the economic and social spheres of society.

There are also a number of more pragmatic issues that the Scandinavian countries have to deal with in order to enhance entrepreneurship. I then leave changes in the institutional conditions aside, because they do not make the Scandinavian context stand out. Considering their presumably better awareness of gender issues, due to feministic work-related values, the Scandinavian countries should put more focus on female entrepreneurship. In this field extensive research is going on. Along with the deconstruction of the boundaries between the public and private sectors, there is also an increasing space for 'public entrepreneurship'.

In Sweden private venturing in the previously public educational and health sectors appears to be very promising. Such initiatives may also inspire 'public intrapreneurship'.

It seems adequate to conclude this contribution to a conversation about the impact of culture on entrepreneurship with some comments concerning immigrant entrepreneurship in the Scandinavian context. Emergent research in the field, especially in Denmark and Sweden, on one hand shows that some ethnic minorities, second-generation immigrants generally, more frequently than Scandinavians enter entrepreneurial careers (Nutek, 2001). Research findings also suggest that 'breaking out' of ethnic economies is as critical a strategic issue in the Scandinavian context as in any other or more multi-ethnic national setting. An increasing exchange between native and immigrant communities in Scandinavia — although immigration is at present (2002) politically restricted in several Scandinavian countries — brings promises of a societal milieu that will be increasingly conducive to entrepreneurship.

NOTES

[1]This section is elaborated further in Johannisson (2003).

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ENTREPRENEURSHIP: THE ITALIAN STORY

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1. INTRODUCTION

Let's start with three basic propositions. In this paper the entrepreneur is considered a) as an *innovator* in a Schumpeterian sense. Either he succeded or failed, he tried to introduce new products, new systems of production, new organizations; b) as a *decision maker* who has an impact on the Wealth of the Nation. From this point of view it is completely accepted the Chandlerian perspective (Chandler, 1977, 1990) according to which a national industrial system is divided into *core* (where scale and scope work) and peripheral (i.e. labor intensive) sectors. The entrepreneurial action has different outcomes for a national economy, depending upon the sectors in which it takes place; c) as an integral part of a whole, a social, cultural, political, legal, national system[1].

Until about twenty years ago the concept of "entrepreneur" enjoyed very little popularity among Italian public opinion. To the most important ideologies which dominated the intellectual climate — Catholic, Marxist, Idealistic — "entrepreneurs" appeared a minor, if not negative, characteristic of the national scenario. He or she was often blamed as a "freeloader" of public resources, an exploiter of workers, a fiscal evader — essentially a social actor inclined to violate common rules of society in favor of self-interest. This judgment was applied, above all, to leaders of big business (often State-owned) of whom it was impossible to ignore their strong ties with the political power and their inability to positively manage social conflict.

This anti-entrepreneurial stance started to soften after 1980, when the intense season of workers' struggles (which had taken off in the late Sixties and was known as "hot autumn") came to an end. In the meantime, a different form of entrepreneurship emerged in Italy. It manifested itself especially in the explosion of "industrial districts" which have since revealed themselves to be the epitome of Italian competitive advantage in the global economy.

The goal of this paper is to balance such a traditional vision, stressing the role and the accomplishments of entrepreneurs operating in large organizations during the 20th century.

It will be shown that their eventual failure was — to a large extent — caused by

inefficiencies in the institutional and political environment. The essay outlines typologies and evolution of entrepreneurship in industrial districts as well as in small and medium size companies. While emphasizing their good results, attention is also dedicated to their weaknesses and contradictions. The main argument is that, without the full success of entrepreneurship in big business, it is impossible to maintain a front row position in the world economy[2].

2. BIG BUSINESS AND THE GOVERNMENT

In the mid Thirties, two of the main protagonists of the beginnings of the State as Entrepreneur, Donato Menichella and Pasquale Saraceno, expressed serious doubts about the existence of "real" entrepreneurs in Italy (Ciocca, 1994: 13; Amatori, 2000: 143-148). Indeed, when in 1933 together with Alberto Beneduce they founded IRI (Istituto per la Ricostruzione Industriale, Institute for Industrial Reconstruction), private initiative did not show itself in a good light. IRI, a completely State-owned holding, was conceived as a temporary owner charged with taking over the industrial securities held by the country's three major banks (Banca Commerciale Italiana, Credito Italiano and Banco di Roma) and eventually selling them off to private buyers. It soon became apparent that the latter goal was impossible to achieve, as in Italy there were no entrepreneurs with private resources who were capable not only of purchasing the banks' shareholdings in sectors such as steel, shipyards, and public utilities but also of financing the continual investments required by such industries.

Even a strong opponent of State capitalism such as Angelo Costa — the legendary leader of the Confederation of Italian Industrialists (Confindustria) — had to admit before the Economic Committee of the Constitutional Assembly in 1946 that it was absolutely impossible to get rid of IRI. And Alberto Beneduce, IRI's first president, was forced to engage in a vigorous fight in order not to undersell companies that the State had taken over, not to give up for ridiculous prices the automobile company Alfa Romeo to Fiat, or the electric corporation SIP (Società Idroelettrica Piemontese) to a coalition of Turin-based businessmen led by Giovanni Agnelli (Fiat's owner), or pass over the ownership of the chemical plant of Terni (a polisectorial group) to the "hungry" Montecatini — the most important Italian chemical company which, if it had been successful in this attempt, would have met with no other obstacles to the materialization of a real monopoly in the field of fertilizers. De facto only Edison and Bastogi — two financial holdings active in the electric industry — were passed over to private hands; they were too profitable to escape the interest of national tycoons (Amatori, 2000).

In any case, IRI can be defined as "a rescue that comes from far away". On analysis, its actual origin can be dated back to 1887 when the government decided that Terni had to avoid bankruptcy. Terni was the country's first modern steel company and the State offered it subsidies, orders, and protectionism. Still, after three years of life it was on the verge of bankruptcy without having yet produced a single pound of steel. The incompetence and the adventurous spirit of its founder, Vincenzo Stefano Breda, contributed considerably to this outcome. "The failure of the company" — writes Franco Bonelli, Terni's historian — "was avoided only because the Bank of Italy agreed to print new banknotes to compensate those

that Terni could not pay back and to create further possibilities of financing the firm". The procedure followed was that of a "real rescue" (Bonelli, 1975: 26; Mori, 1996; Cianci, 1977).

But such a "procedure" was repeated three more times. If, in 1887, the government took care of a single corporation, Terni, by 1911 it was the turn of an entire sector — steel, and, by 1922, of the industrial assets of Banca Italiana di Sconto and Banco di Roma (which included the most important Italian industrial group, Ansaldo). Finally, as has been mentioned, in 1933 the involvement of the State came through the creation of IRI which oversaw all the industrial securities belonging to the universal banks.

In this way by the Thirties the State had assumed entrepreneurial responsibilities to an extent equal only in the Soviet Union. However, the dimensions of public intervention were not the only relevant aspect. A critical point was that, after the rescue of Terni, very high barriers to exit for companies deemed strategic for the country's military defense and economic consistency came to light. These firms lacked a fundamental freedom — the right to go bankrupt. It is an element that a large number of Italian industrial leaders grasp very quickly, thus differentiating themselves substantially from their counterparts in the advanced industrial nations. For the latter — this is the heart of the Chandlerian synthesis — growth occurs for strictly economic reasons, i.e. to cut dramatically costs per unit and at the same time enlarge market share.

Several Italian examples show, instead, that growth is pursued for strategic reasons: large dimensions make entrepreneurs stronger in bargaining with political powers. This is the practice followed by the "steel barons" before the restructuring imposed by the Bank of Italy in 1911 (but a similar policy would be adopted by the "chemical barons" sixty years later).

It is the same attitude showed by the Perrone brothers, leaders of Ansaldo — a wide metal machinery complex. Between 1909 and 1914, Ansaldo received from the government a guaranteed prefinancing so that the ratio between this payment and the expenses for the suppliers was 144%. Probably the most sophisticated cases of *do ut des* with the government can be found in the behavior of the polisectorial groups in the years between the two world wars. Terni, led by Arturo Bocciardo, abandoning after World War One the strategy based on steel and shipbuilding, entered vigorously into the electric and electrochemical field.

However, it did not dismiss the productions aimed at providing steel for the Army. Even if they resulted in serious liabilities, they were still useful in securing good tariffs in the supply of electric power, and favorable positions inside the cartels regulated by the government. Montecatini, whose leader was an empire builder, Guido Donegani, had an absolute need for total control of the domestic market to justify the enormous investment carried on in the Twenties of big hydroelectric plants necessary to produce nitrogen fertilizers. The associations of Italian farmers, a very powerful lobby, in order to keep prices low, strongly advocated the abolition of protective tariffs. Mussolini chose to support Donegani's company and in 1931 issued in its favor a tariff on the nitrogen fertilizers which was so high that it virtually hindered foreign competition. But, starting from that moment, the Fascist government began to put forward a series of requests (numerous rescues of weak chemical and mining companies) that Montecatini could not turn down. They would constitute the origin of the difficulties which in the Fifties would bring the company to the disastrous merger with Edison (Mori, 1996; Lepore Dubois and Sonzogno, 1990; Bonelli, 1975; Amatori, 1990). In the end it does not seem exaggerated to say that a conspicuous part of Italian entrepreneurs are representative of a "political" capitalism opposed to the "managerial" American, "personal" British, "cooperative" German (Chandler, 1990).

3. BIG BUSINESS AND THE MARKET

At any rate, it would be misleading to imply that all Italian big business was bound to the State in a symbiotic relationship. Certainly, nobody refused protectionist tariffs and orders.

Nevertheless, for some entrepreneurs success was due to their capacity of anticipating the market's potentials and needs and of adapting to them technological and organizational choices. There are no other explanations for the story of Giovanni Agnelli, who was the first in Italy to understand that automobiles were not a toy for wealthy people, but a means of transportation that in a near future would change an entire civilization. This vision required avoiding any form of extravagant design in favor of realizing a massive form of vertical integration — from the foundries to the "garages" for sale to the final customer. This strategy and its realization allowed Fiat to reach a clear supremacy within the Italian automobile sector at the eve of World War One and then to seize the great opportunity of military orders during the war. One of Giovanni Agnelli's most important merits was the ability to avoid dispersing those "fabulous profits" coming from State orders in the building of an uncontrollable conglomerate. In the mid-Twenties, only 10% of Fiat's turnover came from outside the automobile sector. Financial resources acquired with the war — at the end of the conflict Fiat was the country's third corporation for social capital after having ranked only 30th at the outset — were spent in buying a big metal mechanic complex, Gruppo Piemontese, to reinforce and consolidate the vertical integration process and in the construction of Lingotto — Europe's most modern automobile factory at the date of its inauguration in 1923 (Castronovo, 1977).

Anyway, it is important to stress that at least before 1950 even this "market oriented" capitalism was unable to grow beyond a certain limit, being unable to extend and socialize — in the "American-style"— the basis and the top of the company's pyramid. In this respect the narrowness of the domestic market had a crucial role. In 1921, if the Italian GNP per capita was 1, that of the French was 1.7, the British 1.9, and the American 3.6 (Fuà, 1981:245).

It is true that in those years a conspicuous part of Italian industry was strongly oriented to exports. In 1922, for instance, 40% of Italian automobile production was sold abroad.

However, export is always risky. If to the deflationary policy worked out by the government in 1926 we add the consequences of the Great Crisis, we can easily understand why the number of exported automobiles dropped from 34,141 in 1926 to 11,940 five years later.

As a matter of fact, for the entire period between the two world wars there was clearly a substantial gap between Italy and the other advanced nations. In 1938 Italy counted only 7 vehicles every 1,000 inhabitants, while Germany could reach 18, France 43, the United Kingdom 44, and the United States 144 (Amatori, 1996:17, 69). When Fiat engineers visited the Ford factory in Detroit in 1926, they reported that to compare the American and Italian productive flux was to confront an Alpine torrent with a stagnant rivulet (Bigazzi, 1980: 918).

The maximum extent of Fordism (i.e. workers becoming buyers of the products they manufactured) that Fiat could afford was the proposal advanced in 1932 by general manager Vittorio Valletta, who invited the company's workers to form partnerships of four in order to buy a Balilla (at the time the cheapest Fiat car) that would be used to reach their workplace every day, while each partner could enjoy the car with his own family one Sunday per month (Bairati, 1983: 69). This was the same country where the mass retailing company, La Rinascente, could enjoy a certain success only with its "five and ten" shops, and not with

the department stores, and where the main market for the most important chemical company, Montecatini, was agriculture (Amatori, 1989 and 1990).

In addition to a perverse link between big companies and political power, the general conditions of demand represent the background of those closed and arrogant lineaments caught at the eve of World War Two by the electric tycoon Ettore Conti in his well known group portrait: "In this period in which every day we repeat that we want to go towards the people, in reality a financial oligarchy has been formed which resembles in the industrial field the old feudalism. The production is greatly controlled by a few groups which in turn are controlled by a single man. Agnelli, Cini, Volpi, Pirelli, Donegani, Falck and a few others literally dominate the various branches of industry" (Romeo, 1987: 152).

In such a climate it is not surprising that the heart of Italian capitalism is constituted by a sector where, given a certain degree of technical skill in the building of plants, what is essential is to cash in and cautiously reinvest a substantial income. This is the electric industry that the investigations sponsored by the Economic Committee of the Constitutional Assembly in 1947 photograph as dominated by five or six corporations, and characterized by a tangle of crossed shareholdings, "cascades", shares with multiple voting rights, total disregard for the diffused shareholders, not at all protected by fixed rules and by institutions able to make them respected (Amatori and Brioschi, 1997).

Yet, even inside this discouraging framework, in the first half of the 20th century, Italy holds an honorable position among the industrialized nations. Even if populated by incompetent managers and speculators, at the eve of World War One the Italian steel industry was able to make the country self sufficient in a non secondary field (Mori, 1996). If Armstrong, British partner of Ansaldo, defines crazy the vertical integration projects of the Perrones, still the German military diplomat visiting the Ansaldo factories in 1912 was compelled to proclaim a full admiration (Segreto, 1996: 135). The practices imposed by the State during World War One (militarization of labor, payments of orders without administrative control) provoked serious distortions in entrepreneurial culture. Nevertheless, if we consider some goods of fundamental importance at the time (steel, cement, electric power, automobiles, sulphuric acid, superphosphates, artificial fibers) at the end of the conflict Italy is the eighth country in the world (Castronovo, 1980: 150).

What is most important is that before World War Two, thanks to tenacious entrepreneurial decisions, we assist at the consolidation of managerial cohorts, of human resources for development, of "organizational capabilities" to use a Chandlerian or an evolutionary economist's expression (Chandler, 1992; Dosi, Nelson and Winter, 2000). In this respect two are the main centers. The first can be found at Fiat, where the beginning of production at Lingotto — but the courageous choice during the turbulent Twenties to build an even larger plant, Mirafiori, reinforced the tendency — compelled the company's leadership to a wide enrollment and promotion of managers (above all engineers) to make the factory work with mechanic precision and create a fluid link with the market. This was how the "men of the Professor" (Vittorio Valletta, who after the war would become president of Fiat, where he entered in 1921 as head of accounting) were formed (Amatori, 1999).

The other fundamental nucleus for the evolution of Italian industrial capitalism took shape at the beginning of the Thirties at Sofindit, the financial holding where Banca Commerciale Italiana — the largest universal bank of the country — had concentrated its industrial securities. Its leader was Oscar Sinigaglia, the Roman engineer who since the first

decade of the century had been trying to solve the "steel question". His project was based on the substantial reinforcement of the complete cycle, the rigorous specialization of the plants, thus granting the possibility of offering good quality steel at low prices to the mechanic industry. The complicated story of this managerial cohort represents one of the most memorable chapters ever written in the history of Italian industry. Headed by one of Sinigaglia's pupils, Agostino Rocca, these managers took charge of a harsh battle inside IRI's holding for the steel sector — Finsider — by designing a big complete cycle plant in Cornigliano, near Genoa, unlike those who prospered on small factories protected by high tariffs. The project of the steelworks dismantled in 1943 by the German army was recovered by the group gathered around Sinigaglia after the war and finally realized thanks to the opportunities offered by the Marshall Plan funds (Bonelli, 1982; Osti and Ranieri, 1993).

In fact, Valletta and Sinigaglia were the only participants in the debate at the Constitutional Assembly where the Italian economy was redesigned after World War Two, to fight against the "Swiss model" based on "organized craftsmanship" advocated by many businessmen (Amatori and Colli, 1999). Valletta and Sinigaglia were unconditionally favorable to mass production and in this way, together with their managers, they became the main characters of the so-called "economic miracle" of the Fifties. Not inferior to them for his grand strategic vision and his capacity to realize it was the founder of the State oil company ENI, Enrico Mattei. His action was a clear example that the structure of the State Entrepreneur designed by Alberto Beneduce in the Thirties, a structure which envisioned State ownership for companies operating in the market, could be very effective.

Valletta, Sinigaglia, Mattei were great innovators, Schumpetenan entrepreneurs in the real sense of the term. They risked investments which common sense considered, to say the least, daring. From immediately after World War Two through 1960, Fiat spent 500 billion lire in new equipment while accomplishing between 1950 and 1960 multiple of five daily production. The adoption of automatized processes brought a worker to produce 5.5 kg per hour in 1956 while 8 years earlier the figure was 1.22. In the same period, the percentage of salaries as a percentage of costs dropped from 39 to 23%. The new Cornigliano plant (inaugurated in 1953) was three times larger than the one the Germans had dismantled ten years earlier. Thanks to a very demanding work of filling in the sea surface, it had an extension of one million square meters, and, when it started to function in 1953, it had a cost of more than 100 billion lire. Half of this sum had been spent for up-to-date continuous rolling mills, decisive for the modernization of the national steel sector. In 1960 Cornigliano accounted for 17% of Italian steel production (1,366,000 tons) and for half of the production of rolled sheets. In 1949 Enrico Mattei presented a request of 50 billion lire for five years to the government. The money would be used to buy drills, to dig wells, to build up oil and gas pipelines. The natural gas extracted by ENI grew from 500 million cubic meters in 1950 — when this resource was available for companies in the Milanese area — to 5 billion in 1958. In 1957 ENI built up a petrochemical plant in Ravenna to produce synthetic rubber and nitrogen fertilizers. It required an investment of 60 billion lire, three times the sum that Montecatini had spent to realize its petrochemical factory in Ferrara. This difference allowed ENI to sell its products at prices of 10-15% lower than those of the rival, thus effectively putting an end to a supremacy that, until then, had been overwhelming in the field of the fertilizers.

Such an amount of fixed capital imposed the need for sweeping away any organizational rigidity that could hinder the continuous flow between the factory and the market, with the risk of endangering the entire entrepreneurial design. Fiat pursued the full application of Fordist methods, the massive enrollment of unskilled workers, the preparation of faithful foremen, the tight control of suppliers who were compelled to borrow money from its financial company, Unione Finanziamenti Industriali. Cornigliano was controlled by a new corporation different from the old Finsider companies so that it could fully develop its innovative role in the Italian steel sector. The Genovese plant witnessed the shift from an organizational structure based on empirical methods and reliance on the technical skills of the workers — the factory as a black box for top management — to one that imitated the American example with its vision of strict operational prescriptions and a perfect visibility of the plant by the company leadership. Corollary of this new organizational structure are the exact definition of the workers' activities (job evaluation) and of the costs of production (costs centers) and the training of front-line managers (TWI, Training Within Industry program).

For ENI, instead, the overall element was the general organizational design of the group that has to realize a complete vertical integration. Under the superholding ENI were active AGIP Mineraria — with the task of dealing with raw materials (oil and gas), SNAM — which transported them, ANIC — refinery for the same, and finally AGIP — dedicated to distribution. A serious bottleneck could be represented by the lack of oil, whose research was vain in Italy and that explains Mattei's commitment in building his famous, innovative, but very risky, network with the governments of the producing countries (Sapelli, Orsenigo, Toninelli and Corduas, 1993).

Investments of an unprecedented size linked with organizational effectiveness provoked outcomes which represent true historical discontinuities. The Italian automobile production record before the war was 77,000 units. With an almost continuous growth, Fiat produced more than one million in 1966. In 1955 the Turinese company presented the first real utility car— known as the "600" — sold at a price that even a worker could afford. In this direction a still more important event was the appearance in 1957 of the "new 500" at an even lower price than the "600": in fifteen years 3,678,000 "new 500s" would be sold. At the end of the Sixties, in Italy there was one car every 5.4 inhabitants — a goal that in the years between the two world wars was considered a mirage, an aim reachable only on the other side of the Atlantic.

Such a leap of the automobile industry goes together with the same evident growth in the steel sector. The Italian production of rolled sheets between 1955 and 1964 rose from 1,300,000 tons to 3,500,000; but, of this amount, two million came from Cornigliano which was bound to Fiat by a supply contract. At the beginning of the Fifties, Italy was the ninth steel producer in the world. By the end of the same, it had moved up to sixth. In the meantime, ENI — that in the year of Mattei's death (1962) was able to offer half a million tons of liquid hydrocarbons and seven billion tons of natural gas — by 1960 was selling gasoline and diesel oil al the lowest prices in Europe (Bairati, 1983; Osti and Ranieri, 1993; Colitti, 1979).

These examples point to the fact that the golden period for the Italian economy is found in two decades, 1950-1970, when GNP grows almost 6% yearly and the main actors are companies like Fiat, Finsider, ENI, Pirelli, Olivetti, Italcementi — surely not terrain for minor entrepreneurs. But, taken the turn of the century as a point of observation, the vision

of Italy which today largely prevails in the national and international scientific community as a country of small and medium size companies and of industrial districts, appears well justified (Amatori, 1999b).

The fact on which we must agree is that the great leaders of the postwar years and their creatures were not sufficient to ferry the country towards the first positions of the world economy. It has been written of a "failed Japanese landing", meaning a landing of Italy in the very first positions of the world economy, a target that would have been possible only thanks to the development of branches of industry such as electronics and chemicals dominated by sectorial size companies (Pirani, 1991). But, for the achievement of such a goal, entrepreneurial abilities capable of dealing with big business were not enough. Instead, an institutional framework inside which these capacities could consolidate, progress, answer to the challenges of competition was called for. To pursue this objective, the entrepreneur converged with other social forces assuming his own responsibilities. But he was only one of the elements which contribute to make correct choices concerning the entire national community, choices in this respect political at the highest level.

4. THE "FAILED LANDING"

In order to clarify our argument we assert that, as far as big business is concerned, had the government desired a different outcome, big business would have oriented its actions in a different way. First of all, the State would have opted to limit its role as proprietor and emphasized the "benign neglect" manifested towards the leaders of State owned enterprises until the Sixties. In other words, government would have behaved as an absent shareholder, according to the prevailing attitude in other Western countries (Toninelli, 2000). At the same time, the political power would have been focused with strong determination on defining a set of rules — antitrust, protection of shareholders, possibility of an adequate interaction between Bank and Enterprise, indications of channels and procedures to make the industrial conflict physiological. These rules constitute the essential seedbed for the success of big entrepreneurial institutions (Barca, 1997).

The formidable momentum enjoyed by the country around 1960 was not supported by the above-mentioned conditions. This is the origin of the "failed landing" — an expression that acquires consistency thanks to some easily identifiable episodes.

a) The failure of "frontier" projects such as the development of electronics by Olivetti (a project too demanding for a company lacerated by family fights) or the diffusion of nuclear power plants that had a sort of "prophet", Felice Ippolito, but was not sustained by the State's industrial policy (Soria, 1979; Curli, 2000).

b) The degeneration of the State as Entrepreneur when overwhelmed by political demands and constraints, a real dispersion of talents epitomized by the bankruptcy of Finsider under the burden of a debt in 1988 of 25,000 billion lire (Amatori, 2000).

c) The consequences of the nationalization of the electric industry. Firms received generous indemnities from the State but the outcome clearly demonstrated that, given the institutional mechanisms characterizing Italian capitalism (especially financial markets), it was impossible to entrust conspicuous flows of money into the "right hands" (Amatori and Brioschi, 1997).

d) The diffuse crisis, after the "miraculous years", of the "families" dominating Italian capitalism "old" and "new". It is a subject that brings us back to the previous point: placing companies in the "right hands". Few attempts were made to consolidate routines for appropriate substitutions of corporations' leadership (Amatori and Colli, 1999).

e) The devastating social conflict that afflicted industrial relations between 1969 and 1990. The conflict, unavoidable wherever the large factory is present, in Italy became dramatically political, challenging the very basis of capitalistic order (Berta, 1998).

5. NEW ACTORS IN A PERIOD OF CRISIS

During the Seventies Italy appeared on the verge of total collapse. Inflation post oil shock approached 20%, official unemployment 8%, public debt consumed 60% of GNP. Big business — private or State-owned — was performing very poorly and the most important factories were upset by terrorism. Given all this, how could the growth of the Wealth of the Nation (GNP) march around 4% per annum, second only to Japan?

The mystery can easily be explained referring to the sound performance of small and medium sized firms. In 1971, about 50% of the total workforce was employed in factories with fewer than 99 employees. A decade later this percentage had grown to nearly 59%.

Notwithstanding this extensive presence, for many years small enterprises were not considered relevant by scholars. Dominant was the convergence theory which sustained the unavoidable success of the much more efficient scale and capital intensive industries, according to which the persistence of small business was synonymous with backwardness.

But, following the above mentioned crisis of the Seventies, in 1978 a seminal book entitled "Tre Italie" (Three Italies), written by the sociologist Arnaldo Bagnasco, was published. For the first time the "old" view of Italy's industrial and social structure — based upon the dualism between the developed and rich North-western regions and a backward South — was subject to revision.

This new perspective emphasized the dynamism of the entrepreneurship with peasant origins especially diffused in the North-eastern and central regions of the country (Cento Bull and Corner, 1993).

However, the importance of small firms in Italy's economic history has been considerable from the very beginning of the industrialization process (Colli, 2002). This is clear if one considers that labor intensive, craft-based sectors typical of the first industrial revolution

have remained a pervasive characteristic of the country's economic development. The presence of a low-cost workforce and the diffusion of the *putting out system* among peasant families, together with a strong tradition of urban craftsmanship and a fragmentation of the domestic market, all provide elements which explain the persistence of small scale production. Notwithstanding the Fascist economic and monetary policies — strongly oriented to favor large corporations — the relevance of small business in Italy was so conspicuous that, immediately after World War Two, it was a common opinion that the country's economy should abandon the policies of State intervention in capital intensive productions (as was mentioned earlier). According to such a view, Italy could sustain international competition only in light and specialized industries characterized by a high degree of craftsmanship.

The "economic miracle" was also a golden period for small and medium sized companies. Technological improvements which reduced the minimum production scale, one of the cheapest labor costs in Europe and market enlargement due to the birth of the European Community, allowed labor intensive, small scale industries in Italy to reinforce their standing in international markets.

Soon it was clear that the strength of Italian small business was largely due to the fact that individual production units were grouped in geographically concentrated clusters scattered all over the Peninsula which were defined by the British economist Alfred Marshall as "Industrial Districts". According to Giacomo Becattini, the economist who first built a theoretical framework to describe the phenomenon, the industrial district is essentially a territorial system of small and medium-sized firms producing a group of commodities whose manufacturing processes can be split into different phases (Becattini, 1989). In its simplest and most stylized form, the industrial district is populated by single-phase enterprises linked to one another, with backward and forward connections, by agreements and contracts which can also be informal and on a personal basis. These features (geographical clustering and production process fragmentation) are embedded in a complex social structure largely dependent on local traditions.

The historical dimension is of great relevance: industrial districts typically have a long-standing history in manufacturing (urban and rural craftsmanship) and in trading (protoindustrialization and putting-out), buttressed by traditions of civic democracy and self-governance. Mainly, these local systems are, according to their history, based upon a dense network of relationships with origins which can usually be traced to productive arrangements dating back to the early modern period, such as the putting out system.

Starting from the late 19^{th} century, in the silk area of Como (Lombardy), some "virtual enterprises" (the so-called converters) were able to manage the production cycle by means of small artisan shops each performing a part of the production process, from weaving to dyeing. In Prato (Tuscany) the same role was played in the production of wool textiles by the so-called *impannatore.* A similar model can also be found in the furniture industry. For instance, the chair-making district of Manzano, near Udine (Friuli), is today made up of more than 800 small units, each of which carries on a specific phase of the production process, while larger enterprises manage the complex subcontracting system, assembling and marketing the final product.

6. ENTREPRENEURSHIP IN THE INDUSTRIAL DISTRICTS

This kind of organizational structure is characterized by a particular form of entrepreneurship. Entrepreneurs of the industrial district share some general, historically permanent, features. Even if there is no systematic evidence on their origins, they show mostly an artisan background and there are rather frequent cases of former employees who decide to become independent. The shoemakers of the Marches region (Central Italy), for instance, share a long-standing tradition of craftsmanship dating back to the early nineteenth century, giving rise to one of the most important districts of the country. The same can be said for the clusters in some pre-Alpine zones, which are active in specialized productions in metalworking, from Lecco (light mechanics) to Premana (cutlery), Lumezzane and Brescia (specialized steel).

However, the origins of this diffuse entrepreneurship are also frequently to be found in peasantry. The pervasive primary sector was traditionally linked to manufacturing being the source of cheap labor and raw materials, of financing and market demand. For instance, the presence — especially in the Northeastern and Central regions — of a form of sharecropping, which stimulated the farmers' ability given an "autarchic" philosophy and continuous confrontation with the owner, has been considered an important premise for further development of independent initiatives in manufacturing. This is the case of the textile and knitwear districts of Modena (Emilia Romagna) and Treviso (Veneto) where a large number of farmers gave growing importance to their part-time activities, thus becoming full time subcontractors.

In general, the peasants' need to integrate their income was among the most important determinants of this kind of diffuse entrepreneurship. Such is the case of some furniture districts in Northern Italy; in the Brianza area, a relatively small territory situated between Milan and Lake Como, starting in the late 18th century, peasants were able to integrate their income coming from the cultivation of cereals and mulberries with the production of low — quality, inexpensive furniture by acting as subcontractors for Milanese merchants — entrepreneurs (Corner, 1993).

Whatever its origin, this entrepreneurship shows a considerable attitude for combining different kinds of resources (both in terms of labor and capital) in a very efficient way and for its focus on narrow but profitable niches of production. Flexibility, i.e. being able to rapidly shift from one production to another, proved to be an important resource. Family has been historically the most important source of labor and financing and it is possible to affirm that there is typically a close identification between the family and the firm.

A very important point is mainly the fact that the individual entrepreneur's actions take place within the more complex and general context of local society, with its rules and "norms". Since the costs derived from imperfect information are high, to be part of the local society became an essential asset for the survival of the enterprise. The industrial district entrepreneur needed to combine not only physical resources and human capital but also to manage his relationships with local networks of a different nature: with workers, with banks and other financial institutions, with local customers and suppliers and so on (Colli, 1998). The most interesting outcome of such a situation is the diffusion, from the 19th century onwards, of cooperative initiatives among local entrepreneurial communities: technical schools, local banks and consortia for distribution.

7. A CHANGING SCENARIO AT THE END OF THE CENTURY: POCKET MULTINATIONALS AND FOURTH CAPITALISM

During the 1980s the successful formula on which the competitive advantage of the industrial districts was based continued to be sustained by favorable market conditions, still low labor costs — largely due to fiscal evasion — and an undervalued currency. For years, this allowed entrepreneurs of the Italian industrial districts to avoid the competition of foreign producers in less developed countries. Yet, at the beginning of the Nineties growing competition brought the Italian small producers to move on to the upper level of the market, adding much more value in terms of quality and design to their products. At the same time, the need for closer control of production costs and for more labor saving investments in production, marketing and distribution brought about the diffusion of hierarchical structures (holdings, groups, formalized networks) inside the previously fragmented framework of local systems of production (Bonomi, 1997).

The "fourth capitalism" — a label coined to distinguish these medium size, internationalized and dynamic corporations from traditional big business, both private and State-owned, and from the single small workshop typical of the industrial districts (Turani, 1998) — only seems to be a "new" phenomenon. In reality, its origins are to be found inside the districts' traditional organization of production which provides the context for relationships between a larger firm — productive but above all commercial — and the smaller subcontractors supplying variable quotas of the whole production (Colli, 2001). A similar structure can be found for instance in the area near Belluno (Veneto), where some producers of considerable dimensions like Sàfilo and Luxottica, which are specialized in the production of eyeglass frames, benefit from the presence of a well-structured system of artisans and craft skilled producers. In the previously mentioned case of the silk district of Como some of the local converters — like the Ratti and the Mantero groups, today world leaders in silk production — invested and integrated both backward and forward, growing considerably while always maintaining a close connection with local small firms. Not very different is the history of some wool producers like Zegna and Loro Piana coming from another industrial district of old origins, the town of Biella in Piedmont, or of an international corporation like the Della Valle group with its close ties with the Marches shoemaking district. This highlights the issue of relationships between these middle-sized corporations and their surroundings, especially that of local production systems as industrial districts.

The relationship between middle-size corporations and local systems is traditionally very close in terms of labor and know-how, flexibility, innovation and also of market demand. One example is SCM, a machine tool company located in Rimini, a small Adriatic town in Emilia Romagna, whose expansion started during the Fifties thanks to the orders coming from the small firms producing furniture in the neighboring area of Pesaro, and which now exports 75% of its annual production valued at 350 million euro. The company Industrie Macchine Automatiche (IMA) in Bologna is linked to the local packaging district, while Danieli, a specialized rolling mills maker located in Udine (in Friuli-Venezia Giulia) with about 800,000,000 euros of annual sales, has its most important market in the small producers of iron bars in North-Eastern Italy. In any case, medium sized, internationalized enterprises are not only to be found in the favorable and dynamic environment of the

industrial districts but are also the result of the growth and expansion of specialized producers who began — as in the case of machine tools makers — to sell their products abroad once internal market had been saturated.

The steady and noticeable growth during the economic miracle of consumer goods production related to households (electric appliances, ceramic and tile productions, furniture and apparel) boosted the growth and the affirmation of the majority of these "new" actors. Candy, one of the most important Italian manufacturers of washing machines, started during the Twenties as a machine tool company in Monza, near Milan. After the war and especially in the Fifties with its transformation of living standards, the company diversified into the production of household appliances, quickly becoming a vertically integrated, large industrial enterprise.

Very similar is the case of those enterprises producing consumer goods (like packaged food, health care goods and clothing) which started their story thanks to the radical changes in Italian society during the Fifties and Sixties. Artsana was founded in 1946 in Como (north of Milan) and quickly specialized in the production of over-the-counter health care and cosmetic goods which enjoyed considerable market expansion during the Sixties. Immediately after the war, the food industry saw the affirmation of specialized enterprises which expanded quickly as an efficient answer to consumer demand. This is the case of Star, one of the most important in the food and beverages industry, founded in 1948 near Milan for the manufacture of dried and canned food. In a few years Star was able to build up a country-wide distribution network, similar to other companies in the same industry such as Ferrero, Barilla, and Parmalat which are today's excellent international competitors in their field.

Specialization and the ability to individuate new markets were the driving forces also in the classic "made in Italy" industries, such as knitwear and clothing. This is the case for current world leaders such as Benetton and Stefanel which transformed themselves in the Sixties from small workshops into integrated enterprises selling contemporary design garments through a worldwide distribution network of franchised shops.

It is worth stressing the fact that some of the medium-sized corporations experienced their growth and consolidation from the late Eighties onwards, quickly transforming from small specialized firms or subcontracting workshops into leading actors on the world market. Notwithstanding this, the ingredients of their success seem not to differ significantly from those discussed above. Telling is the case of Diesel, a well-known brand in casual clothing which is based near the Venetian town of Vicenza. Founded in the Eighties by a group of local entrepreneurs, it experienced an impressive and steady growth from the second half of the Nineties becoming one of the world leaders in its field with yearly sales of about 560 million euro in 2001. Behind these noticeable results, however, lies the fruitful relationship with the local system which provides Diesel with an efficient and flexible network of subcontractors, and combines with an aggressive commercial strategy based upon the presence of Diesel shops all over the world — a path already traced decades before by Benetton.

During the Sixties, the evolution of the most important industries as automobiles and their components, housing construction and consumer goods, fueled the growth of specialized producers which consolidated themselves on the domestic market and then quickly expanded abroad to fill worldwide market niches. This is, for instance, the case of ceramic tile manufacturers in Emilia Romagna located in the Sassuolo area (such as Marazzi-Ragno).

They, in turn, stimulated other very specific productions such as the industrial glues made by Mapei, a Milan-based family company founded in the late Thirties, now a successful multinational company in chemical products for the construction sector. Very similar — even if in a completely different field — is the story of some specialized enterprises which grew to an international dimension following the evolution of the automotive industry, such as car-frame makers like Pininfarina and Bertone. But in this area there are also enterprises which on the basis of a great technical experience positioned themselves as unchallenged suppliers of components, expanding their activity on an international level. It is the story of Brembo, which started at the beginning of the Sixties near Bergamo (Lombardy) as a small mechanic shop working as subcontractor for the most important national car makers.

Following the requirements of its most important customer, Alfa Romeo, Brembo started in 1965 to produce disk brakes progressively specializing in this activity and becoming a world leader in braking systems, so as to now sell abroad almost two thirds of its sales of 500 million euro.

The growth and the dynamism experienced by these enterprises during the last fifteen-twenty years has also brought along the evolution of their organizational structures, in general still not complex but characterized by a relevant degree of vertical integration. The most striking feature of these firms is their corporate architecture which is usually based upon a family holding that controls a large number of internationally scattered, independent productive units (frequently run through joint ventures with local entrepreneurs). The birth of these "pocket multinationals" is a consequence of a rational strategy aimed at the minimization of administrative and co-ordination costs, and is also the result of the path of growth followed by these enterprises, typically pursued by means of the acquisition of existing smaller companies which maintained their administrative independence.

8. A NEW ENTREPRENEURSHIP?

An evolution and transformation of the entrepreneurial role has accompanied the success of the corporations of the "fourth capitalism" although the continuities with the model of small entrepreneurship are still relevant.

The transition from the small workshop to a "real" enterprise has been carried on by the second, and sometimes third, generations, which generally had a better level of instruction than the founders who were characterized by a combination of little formal schooling and a highly practical formation. The enlargement of the firm's boundaries and the adoption of a relatively complex organizational structure has meant a transformation of the decision process which, even if still a family affair, is less "autocratic" and more participative with the involvement of co-opted managers or professionals close to the family. Even in the presence of a certain organizational debate, due mainly to the international dimension of the group, the family remains, as in the past, still at the top, influencing the succession strategies.

Familism (i.e. the identification between the family and the enterprise and the consequent adaptation of the company's goals and strategies to the family's benefit) is, however, still a dominating feature, especially if one looks at succession strategies and internal careers systematically privileging the (male) members of the family. This is reflected also by the

fact that the process of succession is generally perceived as the most delicate and difficult turning point in the life of these enterprises (Corbetta, 2001).

The (on average) extremely good performances of these firms in terms of sales and ROI as well as ROE, has meant that adequate internal funds to sustain expansion have been available. The fact that they are not dependent on financial markets to gather additional resources contributes to the enforcement of one of the traditional features of Italian capitalism, i.e. the symbiotic relationship between ownership and control. In this respect, however, it is a matter of fact that what changed is the quality of the human capital available, which now has fewer specific and product-related skills, and is more oriented to general problem solving.

On the other side, frequent contacts with the international financial community bring foreign institutional investors into the boards of these medium sized corporations which are now frequently listed. In turn, this gives rise to a number of problems related to corporate governance which are completely new for boards traditionally dominated by family representatives.

9. CONCLUDING REMARKS

As emphasized in the first part of this paper, Italian big business has suffered serious defeats after the years of the "economic miracle", real routs which since then it has never been able to make up for. The State as Entrepreneur has disappeared, so have (from an industrial point of view) large corporations as Olivetti (electronics) and Montedison (chemicals) while historical actors of Italian industry like Fiat (automobiles) and Pirelli (rubber) appear seriously weakened. Notwithstanding all this, Italy, while not in the front row, is still among the wealthiest countries in the world. Such a result has been reached mainly thanks to a diffused entrepreneurship in small and medium sized companies that originates from a refined craftsmanship, a tradition of cosmopolitan trade, an ethic of hard work in the countryside (Porter, 1990). This flexible, market oriented entrepreneurship is the opposite of that "political capitalism" outlined in the first part of the paper. The limits of these successful companies are that they do not operate in the fields which bring a country to the world economic frontier.

To reach this goal, in addition to entrepreneurial resources, it would have been necessary to have an "Italy Inc." characterized by an appropriate governmental industrial policy, a tight link between companies and science institutions, a legal framework that permits the mobilization of all the financial resources available. In the course of the twentieth century, Italy, having not been able to materialize these aims, failed the approach to critical industries such as chemicals, electronics, telecommunications, air transportation. They are all inconceivable without the full deployment of large enterprises. It may be that Italy, now fully integrated into the European Economic Community will leave to other countries, inside a continental division of labor, specialization in these frontier sectors, so as to fully enjoy its own unique positioning in goods dedicated to individuals and households.

NOTES

[1] As to different theories and typologies of entrepreneurship the amount of literature is overwhelming. A good review article is Martinelli, 1994.

[2] For an outline of Italian economic and business history see Amatori, 1997.

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APPENDIX 1. The Italian manufacturing industry (percentage of workers according to firm size, 1927-1996)

	1927	1937-9	1951	1961	1971	1981	1991	1996
1-9	37.8	36.4	32.1	30.0	18.6	21.5	23.7	24.2
10-99	21.7	20.7	22.1	26.9	28.7	33.6	38.0	40.0
1-99	*59.5*	*57.1*	*54.2*	*56.9*	*47.3*	*55.1*	*61.7*	*64.2*
100-499	21.2	20.9	20.4	21.6	19.0	18.6	16.1	16.7
> 500	19.2	22.3	25.4	21.5	33.6	26.3	22.0	19.3
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Sources Balcet, 1997: 112

Main Italian companies according to "Fortune 200"

1959	rank	1969	rank	1979	rank	1989	rank	1995	rank	1999	rank
Fiat *(automobiles)*	74	Montedison *(chemicals)*	42	ENI *(oil and natural gas)*	14	IRI *(financial holding)*	11	Fiat *(automobiles)*	41	Fiat *(automobiles)*	40
Montecatini *(chemicals)*	133	Fiat *(automobiles)*	50	Fiat *(automobiles)*	16	Fiat *(automobiles)*	15	IRI *(financial holding)*	50	ENI *(oil and natural gas)*	89
Pirelli *(rubber)*	173	ENI *(oil and natural gas)*	92	Montedison *(chemicals)*	62	ENI *(oil and natural gas)*	28	ENI *(oil and natural gas)*	64	Olivetti *(telecommunications)*	112
		Pirelli *(rubber)*	165	Pirelli Dunlop Union *(rubber)*	105	Ferfin-Montedison *(holding; mainly chemicals and food)*	85	ENEL *(electric)*	142	IRI *(financial holding)*	172
		Italsider *(holding; mainly iron and steel products)*	185	Italsider *(holding; mainly iron and steel products)*	187	Enimont *(oil refining and petrochemicals)*	100			ENEL *(electric)*	186
						Pirelli *(rubber)*	170				
						Olivetti *(telecommunications)*	196				

Sources: Fortune, various years

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A ROUNDTABLE OF PRACTITIONERS' POINT OF VIEW ON ENTREPRENEURSHIP

C. DEMATTÈ
Bocconi University
G. CUNEO
Cuneo and Associates
F. MINOLI
Ducati Motor Holding
V. GIULINI
Sistema Moda Italia
G. ROCCA
Techint Group
R. CATTANEO
Regione Lombardia

Claudio Dematté

Let me introduce the discussion with three premises. Yesterday evening while dining with the speakers I put a number of questions to them: "What is the definition of what makes an entrepreneur? What is the DNA of an entrepreneur? Just what are the ingredients of the entrepreneurial spirit?". In the discussion that followed it became clear that perhaps it is impossible to think and speak solely about the entrepreneur as an individual because very often the entrepreneurial spirit is collective. However, even where it is collective, it is nevertheless always driven along by a specific catalyst. And so one returns to the questions concerning the specific features of this catalyst. The first to use the term *entrepreneur* was Cantillon, in France, in a book published in 1755. Cantillon defines the entrepreneur as a person who takes a risk, who buys at certain prices and sells at uncertain prices. Cantillon also included beggars and thieves in his category of entrepreneurs since they shared the same characteristics. This association has to some extent entered the European mindset, where the borderlines between the above categories are often somewhat fuzzy in people's minds, with the image of the entrepreneur not entirely a positive one.

The second premise: is success through innovative ideas that are projected into the future an essential requisite for an entrepreneur? How do you tell the difference between an entrepreneur and someone who is simply over-ambitious? When they are deciding whether

or not to finance someone, venture capitalists try to distinguish entrepreneurs from those that have new ideas but lack the ability to translate them into positive results.

A final premise: this conference has been organised on the assumption that the entrepreneurial spirit is a force for improvement in society and not simply for the enrichment of individual entrepreneurs. Nor must we focus solely on the entrepreneurial spirit in companies since there are many aspects of the entrepreneurial spirit within educational institutions, philanthropic activities and political activity. The first two speakers were not originally entrepreneurs but have transformed themselves into entrepreneurs during their lives. To some extent they are therefore living proof that it is possible to learn to be an entrepreneur.

Gianfilippo Cuneo

The thesis I am presenting is that "entrepreneurs are made, not simply born". I will not try to set out a balanced presentation. Instead I will seek to sustain a thesis that may well be controversial but happens to be a position I personally believe in. I will speak first about those who are normally considered entrepreneurs. Then, by contrast, about those who are not entrepreneurs. I will then go on to speak about those who were typically entrepreneurs within the past economic context, which is very different from the current situation. After that I will make a few forecasts about those who could become entrepreneurs in the new context. And finally I will speak of the alliance between managers and the world of closed-end funds which constitutes, in my opinion, a new frontier for the entrepreneurial spirit.

Generally speaking, an entrepreneur is considered to be a self-made man, someone who had an intuition about something new (in the everyday sense of the word no entrepreneur does anything banal), who is normally involved in a single business (an entrepreneur who is involved in many businesses is more usually considered a financier rather than an entrepreneur), a man who has extracted the maximum from his skills and who is positively oriented towards saving. Again: he is someone who works tremendously hard, does not delegate his decisions, a man who identifies with his territory and his company to the extent that he wishes to see his company remain in the family forever. And then too an entrepreneur is someone who has enjoyed success. Entrepreneurs who fail are simply blotted out from the collective memory. A doctor who systematically kills his patients is hardly called a doctor. Nor can we call anyone who systematically destroys value an entrepreneur.

Let's now take a look at who isn't an entrepreneur. First and foremost the owners and managers of so many listed Italian companies who have destroyed value over the last ten years are certainly not entrepreneurs. Also, the children of entrepreneurs are not always entrepreneurs: they are entrepreneurs only if they create value. Nor are financiers entrepreneurs either i.e. those who simply finance others with their money.

In the past, entrepreneurs were very often people who chose to be entrepreneurs because no other employment possibilities were open to them. Usually entrepreneurs, in the past, were people who devoted their energies to a niche i.e. to a small segment which large companies ignored. They tend to be small entrepreneurs: many of the small and medium sized companies are managed by entrepreneurs and not managers. This is very much our historical inheritance. Let's now look to the future. My thesis is that if we want to have

entrepreneurs in the future we have to change our game.

First and foremost it has now been clearly demonstrated that in a world which is becoming ever more homogenous the relative size of a company with respect to its competitors is a fundamental factor in achieving profitability. It is no longer possible to be small. The second factor is that a shift of wealth and manufacturing capability is underway towards other regions of the world. Entrepreneurs who therefore choose to work with the factory nearest to home are doomed to failure. Again, the game of acquisitions is of fundamental importance in acquiring relative market share and therefore you either buy out or are bought out. To buy out someone else requires capital. It is therefore necessary to move on from the model of a non-listed entrepreneur to an entrepreneur who opens up to shareholdings, who is even willing to become a minority shareholder in his own company in order to obtain the capital required to create an empire. Finally, to create value, you have to be ready to transfer a significant part of the company capital and then reacquire it at the right moment, as the Barilla family did quite a number of years ago.

I therefore maintain that good managers are the true entrepreneurs who can play a winning hand on a world scale. It may also be the case that some of these managers are also in part capitalists, but their being defined as entrepreneurs is due to their ability and experience, their willingness to take risks (within the limits of safety that must always apply) and their ability to persuade investors to back them. Today the most careful and most intelligent capital investors are the private equity funds. Private equity funds do not behave like superficial analysts because they are managed by expert people who have the courage to think differently, who look at the track records of managers, who think in non-linear ways, take quick action and who have an open mind when it comes to buying or selling companies.

The new entrepreneurs, in my opinion, are hybrid subjects, i.e. they are managers who take risks with their own money and that of others; they are consultants who have made enough errors on their clients' behalf to avoid making them when they work for themselves. I very much hope that there can also be a certain seriality: an entrepreneur must know when the moment is right to abandon a sector, where there is no further room for development, and demonstrate that he also knows how to succeed in new sectors. If this is a little worrying for you all, I would like to invite you, on the contrary, to look at the positive side of this conclusion.

Federico Minoli

As my daughter, Rebecca, who is four years old, says: "You don't know how to do anything, you only know how to speak on the telephone". So, what I am going to tell you is what I do when I speak on the telephone, and in so doing I'll tell you something about my story.

A story that began in 1974, when I started to work in marketing for Procter & Gamble, after which I moved on to marketing at Playtex, first in Italy and then in New York. Then a friend called me to be a consultant, a job I hated from the very first moment. In 1996, after various trials and tribulations, I was once again back doing a managing director's job at Ducati, a company that almost went bankrupt but which I took on the stock exchange in 1999 with a return on capital invested the moment the company was quoted approximately six times the initial investment. A resounding success therefore. Not all turnarounds work

out so well. I have been involved in six and my score stands at three successes, two draws and one failure. At the end of my experience during this period I put the question to myself as to who I am: an *entrepreneur,* a manager, a consultant or simply someone who is lucky?

And here too I have to say I do not have any neat reply. The best thing to do is to tell you how we constructed Ducati's success. Now there is no doubt in my mind that Ducati's success was to a large extent due to luck and in my opinion it would be ungenerous not to thank Lady Luck, citing her as of the first importance in achieving success. The market has grown as it never grew in the past. Machiavelli put it very well when he said that half of our success is due to luck and the other half to our merits. A second element in Ducati's success was a team of people who were truly passionate about doing what they wanted — a passionate team, in other words. And who is most appropriate when it comes to constructing a passionate team? I think that constructing a passionate team requires leadership skills rather than managerial ability. My role in Ducati was certainly that of an aggregator of emotions and a generator of chaos. I am absolutely convinced that the best organisational structure for the future, in a world that is continually changing, is chaos. The more chaotic a situation, the more vibrant the energy; the less structure there is, the more that energy is liberated. I have worked with Luciano Benetton, who detests any structure, anything at all that leads back to an organisation chart, to a layout, or a budget. He even goes so far as to say that budgets are completely useless since their only purpose is to make those who adhere to them feel satisfied.

While I was generating chaos, I needed to find something that aggregated all those people, and that something was discovered in Ducati's "red" colour, in its passion. I put everything in motion: "No-one can enter Ducati unless they know how to ride a motorbike". Before that moment managers parked close to the factory and all the others about half a kilometre away; today managers without a motorbike park half a kilometre away and all those with a motorbike park close to the factory. In my opinion, an entrepreneur has a natural ability to hoist a flag that people can follow. A manager does not have it by nature; he has to construct it for himself.

Once the passionate team has been created, it is essential to have a *vision.* The entrepreneur has a vision that is typically linked to his product. We found a group of engineers that was tied to the product but someone like me, who entered Ducati with a new perspective, immediately saw that the old vision was had run its course. There is nothing less useful than a large capacity motorbike. It is no good for transport, dangerous and costs a lot of money — so why should anyone be tied to such a product? We therefore defined the new vision as follows: from a metallurgical and mechanical company anchored to the product and the factory we switched to an entertainment company that uses motorbikes as one element in a constellation of emotions. This is a shift that only someone with a new perspective can make, someone who has seen things from different angles, with the mentality of a child. A traditional entrepreneur always has a vision; the problems arise when it always remains the same. Whereas in my opinion change is an important part of every successful vision. And change can also come from someone else and not just from the entrepreneur: I have worked with successful entrepreneurs who find it very difficult to tolerate seeing things done in a way that is different from the way they want to have them done.

Of course it is essential to have a plan. Personally, I like to talk about water that boils in a glass vessel: water that boils unleashes an enormous force — the chaos I was talking

about earlier. However, if there is no glass vessel around it, the disruptive power of the vapour is essentially lost. This glass vessel then, inside which the bubbles boil away and generate chaos, is similar to a plan. And our plan was very precise, simple to understand and based on four elements. A niche strategy: in our case "big" means going against the Japanese. But if we go against the Japanese we will immediately lose because we have no ability to compete on a wide front. The second element is a unique product, different from the others, because uniqueness generates enthusiasm, generates the tribe, and generates a sense of belonging. The challenge is to succeed in ensuring that our motorbike never becomes a mere commodity. We then constructed the "Ducati world". The motorbike as an excuse to do a whole series of other things.

Then we abandoned the factory as a place of production. Today 92% of a Ducati motorbike is produced outside; 8% is constructed inside the factory, and remains inside solely because we need to display the construction of the myth for those thirty thousand people who come to visit the factory which we have opened up to the world. So anyone who turns up today at the factory gates can come in and see the construction of their myth, the "Rossa di Borgo Panigale". If it were not for this consideration, it would make much more sense to also produce the remaining 8% outside the factory.

The other evening, while I was writing this report my little girl came to me and said: "*Daddy, this is very boring, let's go and have some fun!*". And in the end, as always, children are right: my success in Ducati was due to the fact that I succeeded in enjoying myself and found a way to communicate my sense of enjoyment and passion to those around me.

Claudio Demattè

I will now hand over to Vittorio Giulini, entrepreneur and President of Sistema Moda, the largest association of entrepreneurs of small and medium sized company entrepreneurs in the clothing sector. After which it will be the turn of Gianfelice Rocca, one of the owners of Techint, a large group that is not very well known to the general public, but which operates worldwide in numerous industrial and service sectors.

Vittorio Giulini

Since the fall of Marxism it has become apparent that there is not just one form of economic liberalism; there are in fact as many economic liberalisms as there are cultural roots in individual countries. While Queen Elizabeth I launched England's rise to power by commissioning iron cannons, Italian princes were ordering their artists to engrave the bronze cannon balls that defended our fortresses. German liberalism is strongly influenced by Frederick II's distinctly Prussian concept: "The State, from crib to grave". Asiatic liberalism, on the other hand, is coloured by the Confucian concept of consent. Italian liberalism too is closely linked to our culture. Between the 13^{th} and 17^{th} century, Italy was far and away the richest country in Europe. During the same period Italy was certainly the greatest cultural centre in the world and it was indeed during that very period that Italy constructed what I consider today to be our country's only truly great asset: its cultural heritage.

The Italian model can be defined as the so-called vertical brand system. In the Anglo-American model "manufacturing" means producing in those countries having the lowest possible costs; "design" means cashing in royalties; "retail" means selling through large stores; "real estate" means specialised companies. In the Italian model production, design, retail and real estate are all integrated within the same company. Industrialists have become stylists and retailers, with stylists becoming industrialists and retailers.

The model comprises an integrated chain of functions. The made in Italy model has in fact become so strong that it is now impossible to be successful in the made in Italy industries unless the same model is adopted. Control of production is vital in order to be unique on the technological plane; control of design too is important in transforming technology into art; control of distribution, again, is crucial in offering consumers a completely different image with a typically Italian character; the chain of shops in our historic city centres is a primary factor creating social consensus around this model. If we close our historic city centre shops our cities will die. The vertical brand system is certainly the Italian system's greatest innovation. However, I would like to make four further observations. The first involves optimum dimension: it is now absolutely clear that "small is no longer beautiful".

On the other hand "big" is not a guarantee of success. The right answer is niche leadership.

The second observation concerns the advantages of the *family business.* A family manages a company with a long-term vision while many managers run a company for short term private profit. Certainly it is also true that family members need to improve their managerial awareness and skills. The third observation concerns the low internationalisation of small and medium sized companies. This is another terrible commonplace that I have heard constantly repeated but which is absolutely untrue. We are world leaders in fashion, furs and jewellery, in all those sectors in which made in Italy is to the fore. Why don't we stop teaching small and medium sized companies about globalisation and instead learn something from those very same small and medium sized companies which have succeeded in becoming global?

A final point: the enormous power of finance. Here too a lesson from history. Italy's decline began in the 16th century when finance became more important than trade in Venice. In the 18th century Holland lost its leadership when finance became dominant. When England, at the start of the 20th century, lost its manufacturing base its decline began. Today, in the USA, finance is becoming increasingly more dominant. Does this indicate the start of America's decline? If history teaches us anything, it may well be so.

What is the original message that comes from the Italian route to industrialisation? Certainly a strong connection with the nation's cultural past. I firmly believe there is no possibility of success today if industrialisation is detached from its cultural history.

It is essential to have roots. Basically this is precisely the same message that Bernard of Chartres launched in the XI century and which has never been more relevant than today: "We are dwarfs standing on the shoulders of those giants who came before us and for this reason alone we can see the horizon and look towards the sun".

Gianfelice Rocca

I will focus on the entrepreneurial spirit within a large group and the continuity of a great family group. Techint is a group that operates in the metallurgical, large construction,

services and oil refining sectors. We are present worldwide with 53,000 employees, of whom 11,000 work in Italy and 18,000 in Argentina. In the last fifteen years we have grown considerably and today our sales stand at approx. 7.5 billion dollars. We have taken part in privatisation and deregulation processes in various countries round the world, as well as entering new sectors.

In our traditional metallurgical activities we have developed some *internal entrepreneurship* mechanisms which have promoted growth. We have also created "Humanitas" from nothing — today the third largest hospital in Milan and a business far removed from our original activities. A vivid demonstration that *internal entrepreneurship* can also be developed within large groups. We are fully motivated to cultivating a strong entrepreneurial spirit. We have also carried out some important financial operations: for example, in telephony, in which we invested 30 million dollars, we exploited the speculative bubble, and as a result made some 250 million dollars. But we do not consider ourselves brilliant entrepreneurs because of such operations. They are examples of enrichment that do not form part of our DNA. Our task as entrepreneurs is to create large and enduring organisations.

I find it rather difficult to draw a clear line between an entrepreneur and a manager because I very much feel there is a continuum. In general, when one speaks about management one is referring to managerial ability. When one speaks about an entrepreneur one tends to refer to innovation. But in any dynamic environment I find it difficult to imagine a top level manager who does not have to continually make innovative decisions. Thus, in any large group, entrepreneurial ability cannot be the prerogative of just a few individuals. But if a biological organism is to survive in a dynamic environment it needs continuity of identity and vision which in a company is guaranteed by a stable shareholding. Large cells, if they are to survive over time, must avoid opening up excessively to the environment because otherwise viral systems manage to infiltrate them and rapidly reduce their ability to absorb other entities, rendering them in turn vulnerable on many fronts. Thus, a company, if it is to grow, needs ethical shareholders (i.e. interested in company continuity), "itinerant" shareholders (i.e. prepared, if necessary, to spend a large part of their time in Mexico or Argentina or China) and shareholders who have a thorough understanding of the business, with passionate managers as their allies.

It is of course essential to evaluate oneself in relation to the market, but this cannot be the only indicator. My faith in the market is rather low: I do not believe the market has shown, over recent years, that it is a particularly efficient arbitrator. Behind our success there also lies a passion for developing managerial talents. In other words, we do not feel it is possible to keep a group of our size healthy and profitable without promoting international managerial talents.

Claudio Dematté

The final word goes to Raffaele Cattaneo, responsible for developing entrepreneurial spirit in the Lombardy Region — our region, and one that is so rich in entrepreneurs.

Raffaele Cattaneo

I would like to communicate to you the perplexity of someone who has to look at all this from the point of view of policy-making. More than certainties, my work involves a demanding and daily search for solutions that at least do not hinder the work of entrepreneurs. It would already be a major achievement if the task of institutions succeeded in simply not retarding entrepreneurial freedom of action.

Today we live in a period in which the entrepreneurial spirit has acquired a positive nuance. Where in the 70s the word "entrepreneur" was almost akin to an insult, calling someone an "entrepreneur" today is very much seen as a compliment. Today, moreover, it is almost the case that appreciation for the entrepreneurial spirit is even somewhat exaggerated.

Politics, on the other hand, has moved in precisely the opposite direction: after years when it was considered the best of activities, saying to someone "You are a politician" today is more or less equivalent to using foul language. Who knows, perhaps as part of the sinusoidal cycle that always tends to accompany these phenomena, a new cycle will shortly commence.

Any such development, especially in view of the new frontiers now opening up, would be an element to be seized upon and exploited. Let me first give you a brief outline of the main features of Lombardy's entrepreneurial economic system. I will then quickly mention the policy lines we are working on and those we are thinking about pursuing in the future.

The first point I would like to look at concerns the Lombardy business model. It is worthwhile recalling some of our system's strengths. First and foremost, we are a polyform system, one that ranges across the entire spectrum of company typologies and dimensions.

We have 120 large companies enjoying turnovers of more than 200 million euro. We have 3-4,000 solid medium sized companies with turnovers of between 15 and 200 million euro. And finally we have an extensive plethora of approx. 700,000 small or very small companies. These are companies that operate in all sectors. One of Lombardy's key features is the presence of a vast array of production processes with areas of excellence in different contexts. And then we have our traditional experience in industrial estates. There are twenty industrial estates in Lombardy. No less than 51% of regional companies are located in these areas.

Very briefly, the region's other two strengths are:

a) internationalisation: our region accounts for approx. 30% of all Italian exports and 40% of Italian imports with some 25,000 companies that routinely operate on the international markets;

b) innovative activity: Lombardy accounts for 30% of Italian expenditure on research and innovation; 50% of robotics companies are based in Lombardy; 80% of turnover in Italian electronic publishing is generated in Lombardy.

Given this context, I shall now come to the second part of my intervention: what are our regional policies? We have six lines of company support policy intervention, especially for small and medium sized companies. The first involves our attempts to contribute to the

development of a positive company culture, through the implementation of a considerable number of initiatives: from financial support for those who wish to set up an entrepreneurial activity, to the diffusion of a positive entrepreneurial model as one of Lombardy's characterising features. The second line has focused on support for education, especially professional training. A third line involves the adoption of innovative credit and finance instruments.

Perhaps the most significant datum is that the Lombardy Region, among those regions which submitted their *expression of interest* for the sixth European research programme, was considerably ahead of the rest of the Europeans. We put forward more than twice the number submitted by the region that came second.

Our penultimate action concerns the internationalisation of companies. I am sure you are all aware of our President's considerable international activity. Within this context we continually seek to exploit such opportunities as a means of promoting companies. We are ever more frequently asked to export our entrepreneurial model. From Latin America to India, even to Japan, our missions receive requests to transfer our experience of the Lombardy model, our ability to combine entrepreneurial skills, culture and artistic achievement. On many occasions those interested also offer to finance such projects.

The last line of action, though it is the one least directly related to policies for companies, is nonetheless the one that is most frequently voiced. In all the meetings we hold with industrial associations in our territory they constantly make the point: "If you really want to support our entrepreneurial spirit set up the infrastructures for us". We have therefore launched an infrastructural development policy. Let me give you just one example: in 2005 the Milan Trade Fair will have a new external complex.

What lines are we pursuing to construct new policies? I can identify three that focus above all on methodology. The first involves our construction of instruments that are increasingly characterised by subsidiarity. Let me give you an example. A few months ago we activated 25 'antennas' or satellite offices abroad, in support of our entrepreneurs. We did it by announcing a call for applications and making a contribution to all public and private subjects able to present us with a suitable support project for our companies abroad. We then drew up a list and have since financed 25 "antennas", sustained by associations, chambers of commerce and freelance entrepreneurs travelling round the world.

A second methodological emphasis concerns the concept of partnership. We are convinced that public development policies can be more correct, or let us say less incorrect, if they are constructed as part of a continual dialogue with those directly involved in the said development and therefore with representatives of companies, trade unions etc. Finally, we believe it is more effective to move in response to demand rather than supply i.e. we make instruments available and then the individual company decides which instrument to request. For example, we accredit subjects, public or private agencies that are able to offer certain services, giving vouchers to operators so that they can spend them where they feel it is most appropriate.

Claudio Dematté

I am sure all of us are extremely grateful to our speakers this morning for their contributions which have helped us to explore and gain a better understanding of the subject of entrepreneurial spirit. A subject that has different levels, various facets and assumes different tonalities

depending on the standpoint from which one views it. A subject that is so important that I believe initiatives like this, involving international comparisons, absolutely must be repeated.

This is very much the intention of both my network of colleagues and Bocconi. Indeed Bocconi intends to explore the subject further and I believe that looking at the various possible interpretations of the phenomenon, be it economic, sociological, cultural or historical, is the only way to attempt, on the one hand, to understand precisely what contributes to a flourishing entrepreneurial spirit and, on the other, to produce ideas and then initiatives which make it possible to actively promote this phenomenon.

SUBJECT INDEX