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Entrepreneurship, development, and the spatial context: Retrospect and prospect

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Research Paper No. 2009/08

Entrepreneurship, Development, and the Spatial Context

Retrospect and Prospect

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February 2009

Abstract

Entrepreneurship has been a topical issue in the business administration literature, but in the past decade a wave of interest can be observed on the role of entrepreneurship in the economic growth literature. This paper aims to highlight the various contributions to the entrepreneurship literature from the perspective of regional economic development. After a broad overview, particular attention is given to the regional action space of entrepreneurs, including their social and spatial network involvement. The paper concludes with a future research agenda.

Keywords: entrepreneurship, regional growth, action space, networks, SME, virtual organization, innovation

JEL classification: L26, R11, O31

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1 Introduction

Regional development has been a permanent source of interest among scientists and policymakers. Regional growth theory has over the years become an important branch of modern economic growth analysis. In the past, locational and resource conditions (e.g., accessibility) used to play a significant role (witness the traditional interest in infrastructural conditions including ICT), but in more recent years, the attention has shifted towards issues like sustainable development and competitive advantages of regions. This trend is also reflected in endogenous economic growth theory and the new economic geography. In this context, we also observe greater interest in entrepreneurship, leadership and regional innovative/creative culture in which the knowledge society also plays a critical role (see also Helpman 2004). This has had far reaching implications for development economics, for instance, by placing more emphasis on market efficiency, tradition/trust and the self-organizing capacity of regions.

In general, we observe not only more interest in efficiency and innovative modes of business activities (witness the emphasis on strategic performance management in corporate organizations), but also a thorough interest in the innovativeness of public sector operations (see Windrum and Koch 2008). Against this background, the strategic driving forces of regional development (such as education, training, R&D, incubator initiatives, creative city actions) are increasingly receiving attention. This merger of public and private sector initiatives as a joint focus on the knowledge and innovation sector is sometimes called the ‘triple helix’ concept (cf., Shane 2003). This is a promising policy support concept, as it is possible to engage local entrepreneurship through joint ventures.

The drivers of growth in a regional system may be classified according to six factors:

- *Human capital*: productive contribution by labour and cognitive talent of people;
- Entrepreneurial capital: productive contributions from smart business activities and innovative attitudes;
- *Financial capital*: financial resources available to support commercial production;
- *Social capital*: interactive resources among economic agents, e.g., in the form of network access and use, that support economic synergy;
- *Knowledge capital*: productive contributions by R&D and education, reflected in patents, concessions, and local spin-offs; and
- *Creative capital*: original and unplanned contributions that support the economic sustainability of local business initiatives.

Clearly, regional competitiveness and effective entrepreneurship are two sides of the same coin. Already since the early history of economics (Adam Smith, Ricardo), good entrepreneurship has been regarded as the critical success factor for economic performance. The notion of entrepreneurial competition was developed more fully a century ago by Marshall. A really pathbreaking contribution to the analysis of entrepreneurship from a broad historical perspective was offered by Joseph Schumpeter in his book *The Theory of Economic Development* (1934). Starting from a circular flow

of goods and money of a given size in a static context, he argues that without growth or economic progress there is no scope for entrepreneurship: history will then repeat itself. However, if the exogenous circumstances are changing, the circular equilibrium will also change. This disturbance of an equilibrium towards a new position is called 'creative destruction'. One of the driving forces for a change towards a new equilibrium is formed by innovation which means a breakthrough of existing patterns of production and productivity. Innovation is thus a creative *modus operandi* of an entrepreneur and induces a process of economic growth. Clearly, flexibility and vitality of the economic system is a *sine qua non* for an adjustment ('resilience') after a disturbance in the original equilibrium position.

Innovation and entrepreneurship are regarded as key factors for high economic performance in a competitive economy (see Acs 2002; and Suarez-Villa 1996). The unprecedented and accelerated economic growth in the past decades has to a large extent taken place in and was spurred on by the information and telecommunications sector (see Roller and Waverman 2001), through which the advanced knowledge economy could be materialized. However, the fruits of the modern knowledge economy are not equally spread over all regions, but exhibit a clear regional and local differentiation (see Acs, de Groot and Nijkamp 2002; Nijkamp and Poot 1997; Porter 2003; Roper 2001). The spatial dimensions of innovation, production and knowledge dissemination have become an important field of study (Fischer and Varga 2003). The innovation literature shows that different analytical frameworks appear to offer different explanatory findings, such as the new economic geography, the new growth theory and the new economics of innovation (see Acs 2002). Such differences in empirical findings emerge, *inter alia*, from the role and seedbed conditions of knowledge production, the appropriability of knowledge in a broader spatial network, as well as the filters and barriers in knowledge spillovers. Knowledge creation and acquisition have nowadays also become part of modern industry and of advanced entrepreneurship (Capello 2002; Shane and Venkataraman 2000). Not surprisingly, the impact of policy on innovation and entrepreneurship in a regional setting has recently received broad attention in the scientific literature.

Since the 1980s, economic research has witnessed an avalanche of interest in innovative behaviour of firms, in particular in the context of regional competitive conditions (for a review, see Bertuglia, Lombardo and Nijkamp 1997; Fischer and Fröhlich 2001). Regions (including cities) are increasingly regarded as important nodes of production, consumption, trade and decision-making and play a critical role in global modes of production and transportation. Locality and globality are two sides of the same medal in an open network. The conventional comparative advantage perspective on regions is no longer sufficient to explain the relative economic performance of regions in a global economy, as also participation in ICT networks, educational systems and business culture are important economic success factors. This awareness has had important implications for regional growth theory culminating in the popularity of the 'new' growth theory (see for an overview also Nijkamp and Poot 1998).

The focus on knowledge as a factor *par excellence* for business performance ties in with the present emphasis on endogenous growth theory, which takes for granted that economic growth does not automatically emerge from technological innovation as 'manna from heaven', but is the result of deliberate actions and choices of various stakeholders, including the government. Government policy in a modern society, however, is no longer a controlling strategy, but a facilitating strategy through which, by

means of investments in R&D, education, training and knowledge centres, etc., the seedbed conditions may be created for successful entrepreneurial performance.

The birth, growth, contraction and death process of enterprises has become an important field of research in so-called firm demographics (see van Wissen 2000). This new field of research is concerned with the analysis of the spatial-temporal change pattern of firms from a behavioural-analytical perspective (cf., Nelson and Winter 1982). Recent interesting studies in this field can be found, *inter alia*, in Brüderl and Schussler (1990), Carroll and Hannan (2000) and Siegfried and Evans (1994). Many studies on growth processes of firms originate from industrial economics or organization and management disciplines, often complemented with notions from geography, demography, or psychology (e.g., Caves 1998; Evans 1987; Gertler 1988; Hayter 1997; or Stinchcombe, MacDill and Walker 1968).

Empirical research has shown that in most cases enterprises change their strategies (products, markets, etc.) in an incremental way. From historical research it appears that radical adjustments do take place, but occur infrequently (Mintzberg 1978). In evolutionary economics it is emphasized that organizations develop, stabilize and follow routines. These routines may change over time, but in the short run they function as stable carriers for knowledge and experience. This causes a certain degree of 'inertia'. Related to the latter point is the core concept of search behaviour. Organizations are not invariant, but change as a result of search for new solutions when older ones fail to work. Search behaviour follows routines, for example, based upon perceptions 'coloured' by the previous situation and biases in information processing (see also van Geenhuizen and Nijkamp 1995). The study of the development trajectories of individual firms from a spatio-temporal perspective is sometimes called 'company life history analysis' (see van Geenhuizen 1993). It uses mainly a case study approach and aims to trace and explain the evolution of firms over a longer period. Particular attention is then given to entrepreneurial motives for corporate change at the micro level. Factors to be considered are, *inter alia*, the business environment, leadership, links between strategic and operational change, human resource management and coherence in management (see also Pettigrew and Whipp 1991). Information acquisition—e.g., through participation in networks of industries—is of course also an important element to be considered. In this context, also the local 'milieu' (e.g., through *filières*) may play an important role.

2 The regional nexus

Structural change and economic development are usually seen as the outgrowth of new and creative combinations of economic activity. The dynamics in this development process can largely be ascribed to innovative behaviour of risk-taking entrepreneurs. It is noteworthy that studies on entrepreneurship have shown in the course of economic history a fluctuating pattern of interest among economists. Illuminating examples can be found in the works of Schumpeter (1934) and Galbraith (1967). An interesting overview can, *inter alia*, be found in Hébert and Link (1989), who address the motives and economic background of entrepreneurship; in their rather comprehensive study they distinguish the German, Chicago and Austrian schools of thought. In general, there appears to be a broad consensus that the entrepreneurial act is pursued by a risk-taking rational businessman in a small-scale setting, who dares to choose new, potentially

beneficial directions and to explore less travelled pathways. Innovative acts are not generated by formal policies, but by challenging stress situations in a competitive environment that may bring about high revenues but also unexpected losses. From an evolutionary perspective, the 'animal spirit' is the driving force in a real entrepreneurial climate.

The globalization trend in the past decades has prompted the emergence of an open space-economy, with a high degree of imports/exports of capital, labour, information and knowledge across the border. International migration and spatial mobility of firms exhibit a similar pattern. The last part of the twentieth century has witnessed a massive downsizing and drastic restructuring of many corporate firms. This new economic area, less based on the traditional inputs of natural resources, labour and capital, and more on the inputs of knowledge and ideas, is often labelled as the 'entrepreneurial economy'. This new age takes for granted the Schumpeterian ideas on risk-taking entrepreneurship as the basis for innovation and economic progress. Paradoxically, the increased degree of uncertainty creates also many opportunities for small and young firms, and hence leads to higher rates of entrepreneurship. Entrepreneurship affects the economy both directly and indirectly, and at various levels, through innovation, competition and restructuring (Wennekers and Thurik 1999). Empirical investigations have shown that both a higher rate of new business start-ups and a higher rate of turbulence (the sum of start-ups and closures) enhance, after a certain time lag, economic growth and job creation (Carree and Thurik 2003). Clearly, entrepreneurship is not only a driver for economic growth, competitiveness and job creation but also a vehicle for personal development and the resolution of social issues.

It is widely recognized that the region has become a fundamental basis of economic and social life. The national level of observation, though still important, is no longer the uniquely privileged point of entry to our understanding of economic development and all the more so given the fact that the barriers between national economies are, in certain respects, breaking down, at least in Europe (Scott and Storper 2003).

Innovation and entrepreneurship are not equally distributed among sectors and regions. In the past two decades we have witnessed a renewed interest in the seedbed conditions for small- and medium-sized enterprises (SMEs), as it was recognized that the innovative potential of the SME sector was very high (Acs 2002; Acs and Audretsch 1990). Many start-ups appear to be small-scale in nature and hence it is no surprise that new entrepreneurship is often found in the SME sector. The current economic conditions reflect also new types of industrial organization among commercial firms (e.g., network constellations) in which entrepreneurship plays a key role. It is therefore conceivable, that in recent years the action-oriented concept of entrepreneurship is back on the stage with a particular view to the regional and network conditions for the emergence of innovative and competitive entrepreneurship (Danson 1995; Davidsson 1995; Deakins 1999; Foss and Klein 2002; Nijkamp 2003; Pineder 2001; Preissl and Solimene 2003; Stam 2003). Entrepreneurship means a sailing tour under very uncertain and changeable weather conditions, driven by survival strategies in a competitive and sometimes antagonistic world (see Mehlum, Moene and Torvik 2003; Stough, Kukarni and Paelinck 2002). In such evolutionary economic developments, due attention is to be given to incubation conditions and technogenesis processes which drive regional growth.

Regional economics in the past decades has made a successful attempt to uncover the complexities of the modern space-economy. It has led to important integrations of scientific perspectives, such as an integration of agglomeration theory and location theory, trade theory and welfare theory, or growth theory and entrepreneurship (including industrial organization). The blend of rigorous economic analysis and geographical thinking has furthermore induced a bridge between two traditionally disjoint disciplines, while this synergy has laid the foundations for innovative scientific cross-fertilization of both theoretical and applied nature in the important domain of regional development. The region has become a natural fruitful anchor point for an integrated perspective on the dynamics in the space-economy, such as regional development in the context of changing labour conditions, or spatial innovation in the context of metropolitan incubator conditions (see Florida 2002).

There is clearly a wealth of literature on regional convergence/divergence and on the factors determining structural disparity. In the past decades we have also witnessed the rise of many applied studies (see e.g., Kormendi and Meguire 1985; Barro 1991; Abreu 2005), in which extensive databases were analyzed in a comparative perspective.

In light of the previous observations, regions face two imperatives in a market-driven world. First, they have to be concerned with socioeconomic welfare, notably employment. Job creation, an important indicator of economic growth, is central to the wealth-creating process of a regional economy. The second imperative is the ability to develop the economy. Development includes two interrelated processes: structural change and productivity improvement (Malecki 1997a). These processes take place in a multi-faceted force field.

Regional development manifests itself as a spatially uneven change in a system of regions. Regional divergence, rather than regional convergence, is a usual phenomenon that has attracted thorough attention from both the research community and policy agencies. The standard neoclassical view of regional growth would predict that low-wage regions would acquire productive investments from high-wage regions and/or export cheap labour to these areas. Then, the market system in the longer run would lead to an equalization of factor payments, so that in the final equilibrium, a convergence among regions would occur. In reality, this simplified model is subjected to many restrictive assumptions (full mobility, absolute cost differences, no institutional inertia, complete foresight on profitable investments, constant returns to scale), so that an equilibrium may be very hard to achieve. Regional change at the end is the result of entrepreneurial activity in which innovations (new or improved products and processes, new management styles, locations) are key factors.

Entrepreneurship has acquired central importance among the processes that affect regional economic change. Entrepreneurs are essential actors of change, and they can act to accelerate the creation, diffusion and application of new ideas. In doing so, they not only ensure the efficient use of resources but also take initiatives to exploit business opportunities (OECD 1998). A central reason for the interest by policymakers in entrepreneurship is its apparent capacity—based on US experience (see OECD 1989)—to create, directly and indirectly, employment and wealth. An important indication of the significance now attached to entrepreneurship is the OECD study on *Fostering Entrepreneurship* to increase economic dynamism by improving the environment for entrepreneurial activity (see OECD 1998).

This paper makes a modest attempt to review the current literature on entrepreneurship. It is not a literature on a phenomenon that has reached a mature equilibrium, but as one that is still vigorously developing. Clearly, to review such an expanding field constitutes an almost impossible task, at least with regard to completeness of coverage.

3 The entrepreneurial hero

Modern economic and technological systems are indeed in a state of flux. Consequently, recent years have witnessed an avalanche of interest in entrepreneurship, in particular the critical success factors of the modern 'entrepreneurial hero' and the wider urban and regional development implications of emerging entrepreneurship in favourable seedbed areas. It goes without saying that in the recent past also the conditions that facilitate proper entrepreneurship policy or the opportunities of public-private partnership constellations have received increasing attention. Research in this field has focused in particular on fact finding, on theory development and on modelling contributions and has aimed to get a better understanding of this complex multi-actor force field. Contributions have been made by representatives from different disciplines, in particular economics, regional science, industrial organization or behavioural psychology. And in this context, the critical importance of knowledge and information in our ICT-driven world is increasingly recognized and it has become an important field of study.

Entrepreneurship is a phenomenon that takes several forms and appears in small and large firms, in new firms and established firms, in the formal and informal economy, in legal and illegal activities, in innovative and traditional concerns, in high-risk and low-risk undertakings, and in all economic sectors (OECD 1998). Apparently, entrepreneurship is a multi-faceted phenomenon that can be viewed from different angles. Entrepreneurship has been a topic of long-standing concern in economics, but there remains little consensus on the concept of entrepreneurship (see Hébert and Link 1989). An extensive review is found in Fischer and Nijkamp (2008).

Different authors stress different facets of entrepreneurship. Schumpeter (1934), for example, emphasizes the creative component. For Schumpeter the creativity of entrepreneurship lies in the ability to perceive new economic opportunities better than others do, not only in the short term as arbitrageurs, but also in the long term as fillers of innovative niches (Suarez-Villa 1989). While in Schumpeter's concept risk-taking is not a definitional component, Knight (1921) emphasizes the entrepreneur's role as dealing with risk in a context in which entrepreneurship is separable from the control of the firm. More recently, Schultz (1980) has chosen to define entrepreneurship as the ability to deal with disequilibria rather than the ability to deal with uncertainty. Risk does not enter prominently into this concept of entrepreneurship. In his view, definitions of entrepreneurship which are uncertainty-based cannot logically relegate risk to a position of little or no importance. Finally, several other economists including Piore and Sabel (1984) stress the network character of entrepreneurship, a new form of entrepreneurship based on innovative activities carried out in clusters of firms. A review of the conceptual and operational definitions of entrepreneurship can be found in Bögenhold (2004).

Innovation has become a fashionable topic in modern economics, but the foundations of this concept date back already to Marshall (1890), who introduced the notion of industrial districts, in which a strong spatial concentration of (usually smaller) firms may be found and where each of these firms is specialized in one (or a few) elements of the production process of the main economic activity in the area concerned. This concentration is not only the consequence of market-driven economic and technological efficiency requirements, but is also anchored in the region's cultural, institutional and socio-economic value systems (such as trust, cooperation, social support systems). Industrial districts have in general major advantages, in particular, lower production costs, reduced transaction costs, rise in efficiency of production factors deployed and enhancement of dynamic efficiency (cf., Gordon and McCann 2000; Lever 2002; Porter 2000). Such economic-technological clusters form the seedbed conditions for modern entrepreneurship (see Rabellotti 1997). An extensive description and typology of regional clusters in Europe can be found in the 'Observatory of European SMEs' (European Commission 2002) in which a distinction is made into regional clusters, regional innovation network and regional innovation systems. A review of the literature on regional clusters is given in Asheim, Cooke and Martin (2006).

The OECD (1998: 42-4) identifies three important characteristics of entrepreneurship that have emerged in the light of the above views. First, entrepreneurship involves a dynamic process in which new firms are starting up, existing firms are growing and unsuccessful ones are restructuring or closing down. A second characteristic of entrepreneurship is that—to the extent that it implies control of the process by the entrepreneur-owner—it tends to be identified with small business where the owner(s) and manager(s) are the same.

Finally, entrepreneurship entails innovation. This view stems from Schumpeter's (1934) suggestion that entrepreneurial innovation is the essence of capitalism and its process of creative destruction embodied in new products, new production processes and new forms of organization.

In both science and policy circles, it is nowadays widely accepted that knowledge is the key to success, and that explains why with the advent of the ICT revolution so much emphasis is placed on the promises offered by our modern knowledge society (cf., Audretsch and Thurik 1999; Nijkamp and Stough 2002). The ICT sector in combination with drastic changes in the industrial organization will exert profound influences on modern spatial-economic systems. These dynamic developments will undoubtedly create a new urban and regional scene dominated by the digital economy (see Cairncross 1997). The ICT sector may in principle create the conditions for a dispersal of economic activity, but the network constellations of a modern industrial system will at the same time call for close interactions favouring agglomeration forces. What we actually observe in recent years is a reinforced position of urban nodes in global networks (see Castells 1996; Preissl and Solimene 2003; Scott and Storper 2003). Furthermore, the ICT orientation of urban areas induces also a clear emphasis on knowledge infrastructure and knowledge transfer in urban agglomerations, a development which induces both centripetal and centrifugal urban development (see Kolko 2002; Smith 2001). Learning and training mechanisms in a modern urban and entrepreneurial setting are apparently the key conditions for economic performance. In a recent book, Drennan (2002) demonstrates clearly that the ICT sector flourishes best in large urban concentration, as this favours scale advantages and human interaction. In

conclusion, our world is showing an unprecedented techno-economic dynamics, with far-reaching implications for the space-economy.

A frequently used measure of innovative activities is the output of the knowledge production process measured in terms of patent applications. But innovation is a phenomenon that is difficult to capture empirically. Patent-related measures have two important limitations (see Fischer, Scherngell and Jansenberger 2006). First, the range of patentable inventions constitutes only a subset of all research and development outcomes, and second, patenting is a strategic decision and, thus, not all patentable inventions are actually patented. As to the first limitation, purely scientific advances devoid of immediate applicability as well as incremental technological improvements, which are too trite to pass for discrete, codifiable inventions are not patentable. The second limitation is rooted in the fact that it may be optimal for firms not to apply for patents even though their inventions would satisfy the criteria for patentability. Therefore, patentability requirements and incentives to refrain from patenting limit the measurement based on patent data. R&D-related data, while important, relate to the input of the knowledge

In the traditional regional economics literature we already find that space offers discriminating economic conditions. And also nowadays we realize that, despite the ICT sector, knowledge and entrepreneurship are not ubiquitous goods that are freely available everywhere, but have clearly geographical and institutional backgrounds. There is an avalanche of recent studies on the geography of innovation and economic progress (see e.g., Boekema et al. 2000; Brons and Pellenbarg 2003; Gallup, Sachs and Mellinger 1999; Van Oort 2004). Notwithstanding the ‘death of distance’, physical geography is nowadays still a major determinant of competitive economic conditions, such as access to main transport and communication arteries.

4 Driving forces of entrepreneurship

Clearly, geographical space is not able to create sufficient conditions for innovative developments or novel institutional arrangements, but it is important in that it may embody necessary or desirable conditions for new forms of behaviour in both the private and the public domain. The urban incubation theory is a nice illustration of this argument. The recent interest in the new economic geography has clearly pointed out the critical importance of spatial accessibility in regard to the emergence of innovative attitudes and of institutional support mechanisms (see Acemoglu, Johnson and Robinson 2001; Hall and Jones 1999). Such institutional ramifications are not only related to regulatory systems such as property rights or stable political regimes, but also to self-organized modes of cooperation and competition in the private sector. The main challenge from a research perspective is the identification of promising human capital conditions from a regional–institutional perspective, while taking account of the self-organizing potential of business life in a given area (see Lundvall 1992; Norton 2001; Oakey 1996). The concept of a ‘learning economy’ has to be mentioned in this context as well, as this notion indicates that evolution is not a rectilinear development, but is dependent on deliberate choices and cognitive feedback decisions of humans in an uncertain environment, who respond endogenously to new challenges and to creative opportunities offered by social and economic interaction. This new mode of producing and interacting is a major departure from Fordist mass production methods in the past.

Regional development is a dynamic phenomenon with a permanent change in business activities. This change may be caused by innovation, by decline and by the birth and death of firms. The development of the SME sector plays a critical role in spatial dynamics, as many forms of creative entrepreneurship are found in this sector. Clearly, the regional system (education, social support system, culture, accessibility, etc.) plays an important role in the changing conditions for entrepreneurship. Entrepreneurial adjustment patterns are thus of decisive importance for convergence or divergence patterns in regional systems. But the fundamental question remains: which are the drivers of new business investments and new entrepreneurial modes of operation?

Mass production in large-scale concentrations has been a prominent success factor in the age of industrialization. Labour specialization and—later on—capital specialization was a *sine qua non* for a productivity rise that was needed to survive in a competitive economy or to become a winner in a growing market. Mass production, however, creates also a high degree of path dependency, lock-in behaviour and hence inertia in large-scale enterprises, with the consequence of a low degree of flexibility and adaptability to new circumstances. In the course of history we have learned that mass production is not the only mode of industrial organization, but is also accompanied and sometimes even facilitated by SMEs, which have often demonstrated a surprising ability to adopt new production possibilities (including distribution and logistics) (cf., Marsili 2001; Suarez-Villa 1989). The fact that ‘big size’ is not always the optimal level of a firm has been thoroughly analysed by You (1995), who offers four explanatory frameworks:

- *Technological*: the optimal scale of a firm is determined by economies of scale and scope as well as by the span of control, so that the optimal firm size is the result of scale economies and diseconomies;
- *Institutional*: according to the transaction cost theory (see Coase 1937; Williamson 1985), the governance of a complex undertaking with many activities may cause high internal transaction costs, so that it may be more beneficial to resort to the market for specific activities (e.g., non-core activities);
- *Organizational*: the type of industrial organization (e.g., monopoly, oligopoly or monopolistic competition) is reflected in the market share of a firm, which is in turn determined by the price, the product uniformity (or specialty) and the managerial structure; and
- *Dynamics*: due to path dependency, lock-in behaviour, cultural environment, age of the firm and other determinants, the past situation of the firm may impact on its future size.

Although the industrial revolution has created the seedbed conditions for large-scale industries, the importance of small-scale activities has to be mentioned here. The existence—and sometimes resurrection—of a strong SME sector in various regions or urban districts was already noted by Marshall (1890) and later on by many industrial economists, who observed that innovative behaviour of existing or new firms does not necessarily increase their firm size. Examples may be found in many industrial districts (e.g., Lyon, Solingen, Sheffield, Rhode Island), where differentiated market orientation, flexible modes of production, and regional governing institutions controlling a balance between competition and cooperation were the most prominent features. This model was called *flexible specialization* (for details, see Piore and Sabel 1984; Sabel and

Zeitlin 1985) and was based on networks of partly competing, partly cooperating firms involved in production and/or distribution of goods in a given region. Innovation was the driving force of these networks, which were subject to permanent change, depending on market conditions and competition. The strong feature of flexible specialization was the high degree of craftsmanship and skills of all actors involved in a clearly visible regional profile. When market conditions were changing, new networks could spontaneously emerge, so that the market positions could be kept. This industrial constellation could only be maintained under conditions of flexibility and mutual support of all actors involved.

The entrepreneurial event takes shape through the interaction of two sets of factors: personal (micro) factors and environmental (macro) factors. Much of the literature on entrepreneurship has focused on the micro factors, the characteristics of an individual to become an entrepreneur and to start a new firm. These studies focus on the role of factors such as personality, educational attainment and/or ethnic origin (Lee, Florida and Acs 2004). Personality studies find that entrepreneurship is associated with characteristics such as alertness to business opportunities, entrepreneurial vision and proactivity (see Chell, Hawarth and Brearley 1991). Research on personality, moreover, finds that entrepreneurs exhibit greater individualism than non-entrepreneurs do (McGrath, MacMillan and Scheinberg 1992).

Roberts (1991) emphasizes aspects of local culture and attributes as critical to building a local environment that fosters entrepreneurship. Even though cultural attitudes are formed through complex processes that are not well understood, it is a generally accepted view that cultural factors affect the way in which business is done. Such factors, for example, influence the willingness to cooperate with others and may reinforce trust and personal reputation that can reduce transaction costs in doing business. Conversely, an environment characterized by mistrust may oblige entrepreneurs to spend time and money to protect against the potentially opportunistic behaviour of those with whom they work. This may deter some of the entrepreneurial activity (OECD 1998). But there has been little research analysing systematically the impact of trust/mistrust on entrepreneurship.

High levels of entrepreneurial activity are often ascribed to cultural attributes. Culture, indeed, seems to play a critical role in determining the level of entrepreneurship within a region. Other things being equal, an environment in which entrepreneurship is esteemed and in which stigma does not attach to legitimate business failure will almost certainly be conducive to entrepreneurship. In the US the strong pro-entrepreneurial culture has assisted to shape institutional characteristics of the economy that facilitate business start-up, reward firms based on their economic efficiency, allow low-cost exist for entrepreneurs who succeed, fail or simply want to move on to a new venture. A further striking aspect of the US entrepreneurial environment is the ample availability of risk capital and generally well-functioning market mechanisms for allocating this efficiently across a wide range of size, risk and return configurations (OECD 1998).

The key aspect of favourable entrepreneurial environments, however, is—as emphasized by Malecki (1997a)—thriving networks of entrepreneurs (see section 5 for further details), other firms and institutions, providing capital, information and other forms of support. The theoretical notion of the *milieu* introduced by the GREMI group (Groupement de Recherche Européen sur les Milieux Innovateurs) epitomizes these characteristics (see Maillat 1995). Entrepreneurial development is most likely to be

successful in larger urban regions, especially in metropolitan regions, where innovativeness, an entrepreneurial climate and business opportunities are relatively abundant (Malecki 1997a).

Nowadays, with the advent of the ICT sector favouring network formation, such constellations based on flexible specialization are usually coined *virtual organizations* or *virtual enterprises* (cf., Cooke and Morgan 1993). They refer to organization networks that have a flexible structure, that are governed by trust and innovative spirit, and that resemble for the outer world as one unambiguously identifiable and complete organization. The control and command structure is not always very clear and may be flexible as well. According to Hale and Whitlam (1997): ‘The virtual organization is the name given to any organization which is continually evolving, redefining and reinventing itself for practical business purposes’. Virtual enterprises may have different appearance forms. Examples of this organizational model are (see Noorman 2002):

- *Internal virtual organization*: an organization comprising relatively autonomous teams which can be flexibly employed (Campbell 1997); illustrations can be found in virtual offices and lean offices;
- *Stable virtual organization*: an industrial model based on an outsourcing of non-core activities to a relatively small and fixed number of intermediaries;
- *Dynamic virtual organization*: large-scale but flexible cooperation between industrial organizations based on ad hoc opportunistic market motives (cf., Upton and McAfee 1996); and
- *Web-enterprise*: an organization centred around a (temporary) network of experts in a given field, sharing knowledge management and information for dedicated purposes.

The advances in the ICT sector have, of course, induced the transition to virtual network activity. It is clear that a wide variety of virtual enterprises is emerging nowadays. Their common feature is the trend to shorten the product life cycles, to be subject to permanent innovation pressure, to be information-oriented, to be driven by high quality targets (zero defect), to operate in non-hierarchical modes, to be market-oriented through learning-by-using interactions and to take care of the entire value chain (cf., Morgan 1991).

5 The regional action space

A region is a spatially organized entity that offers the geographic seedbed conditions for entrepreneurship and their spatial network constellations, both physically and virtually. The governance of such a complex network organization is fraught with many problems, as innovative behaviour cannot so much be steered by policy. But policy can create support mechanisms through which self-reliance, self-esteem and confidence may be shaped. This requires in particular proper administrative support systems that favour business trust via non-bureaucratic, flexible and tailor-made governance initiatives.

Despite much variety, we observe in almost all cases a decentralized mechanism for governing cooperative relationships. Cooperation becomes volatile, but needs rules and trust. Consequently, the principle of trust has become a popular concept; it is less based

on emotion but rather on economic rationality which may be more transaction-specific (Dasgupta 1988; Granovetter 1985; Linders, de Groot and Nijkamp 2005). Consequently, there may be a need for more institutional support systems or various forms of institutional embeddedness in order to prevent destruction of human capital for ad hoc purposes (cf., Hagen and Choe 1998). This brings us to a major issue for public policy: is a non-formal public-private governance mechanism feasible that ensures the public interest (e.g., a stable regional development) and enhances private performance (e.g., innovative behaviour)? Availability of resources, smart infrastructure and proper education and training systems, accompanied by close interactions between the business world and the public sector, are critical success factors in this context (see Stough 2003). It goes without saying that the spatial context of innovation and entrepreneurship needs an intensive research effort in order to understand the complex mechanism of regional and urban economic development.

In the literature on technological innovation and regional growth—following the rise of the new growth theory—three major drivers of growth were outlined: the knowledge base, innovative culture and action, and public infrastructure.

Entrepreneurship does not take place in a wonderland of no spatial dimensions, but is deeply rooted in supporting geographic locational support conditions (such as favourable urban incubation systems, venture capital support conditions, accessibility and openness of urban systems, diversity and stress conditions in the urban environment, heterogeneous and highly skilled labour force, communication and information infrastructures, collective learning mechanisms, etc.). With the advent of the modern sophisticated communication and network structures, the action radius of entrepreneurs has significantly increased (see e.g., Reggiani and Nijkamp 2006). Consequently, the geography of entrepreneurship and innovation has become an important field of research in modern regional economics, in which the dynamics of firms is receiving major attention.

There are various reasons why of all types of firm dynamics and new firm formation have attracted much concern (see van Geenhuizen and Nijkamp 1995). Perhaps most significant is the fact that new firms provide new jobs. A second reason is that new firms are often involved in the introduction of new products and processes in the market. Accordingly, they may provide a major challenge to established firms and encourage them to improve their product quality and service or to reduce prices. On the other hand, it should be recognized that newly established firms face relatively large risks, due to lack of organizational experience and cohesion. As a consequence, the death rate among start-ups is relatively high and tends to decrease over time. Many entrepreneurs appear to die at a young age. It is clear that successful new enterprises contribute significantly to the economy and employment in the region concerned. There is, however, usually a large sectoral and geographical variation among the success or survival rates of new entrepreneurs (see Acs 1994).

The study of the development trajectories of individual firms from a spatio-temporal perspective is sometimes called ‘company life history analysis’ (see van Geenhuizen 1993). It mainly uses a case study approach and aims to trace and explain the evolution of firms over a longer period. Particular attention is then given to entrepreneurial motives for corporate change at the micro level. Factors to be considered are, *inter alia*, the business environment, leadership, links between strategic and operational change, human resource management and coherence in management (see also Pettigrew and

Whipp 1991). Information acquisition, e.g., through participation in networks of industries, is of course also an important element to be considered. In this context, also the local 'milieu' may play an important role.

It is a widely held belief that metropolitan environments offer favourable incubator conditions for creative entrepreneurship, as in this setting the conditions for proper human resource management (e.g., by means of specialized training and educational institutes) and labour recruitment are most favourable (see, for example, Thompson 1968; Leone and Struyck 1976; Pred 1977; Davelaar 1991; or Lagendijk and Oinas 2005). But it should be recognized that various non-metropolitan areas also do offer favourable seedbed conditions to the management of corporate change. The reason is that in many non-metropolitan areas the information needs are met in localized learning mechanisms, based on a dynamic territorial interplay between actors in a coherent production system, local culture, tradition and experiences (see Camagni 1991; Storper 1993).

This view comes close to the one which puts a strong emphasis on the trend for localization in less central areas where doing business is a final resort or a survival strategy. Advocates of the latter idea adhere to a vertically disintegrated and locationally fixed production, based on a shift to flexible specialization. Some empirical evidence on non-urban seedbeds is found in high-technology regions such as Silicon Valley, Boston, the M4 Corridor, and in semi-rural areas such as the Third Italy. Although the success of economic restructuring in these regions—as a result of many high-tech start-up firms—is, without doubt, the pervasiveness of the trend for flexible specialization, concomitant localization is not sufficiently proven (see Gertler 1988; van Geenhuizen and van der Knaap 1994). Aside from a trend towards localization there is a trend towards globalization, associated with the growing influence of multinational corporations and their global networking with smaller firms (see Amin 1993).

In the light of the previous observations it may be argued that modern entrepreneurship is based on associated skills of a varied nature. An entrepreneur is certainly an opportunity seeker, but in so doing he needs to have an eye open on a rapidly changing external environment. As a consequence, firm demography is a multidimensional field of research in which psychology, sociology, marketing, political science, economics, finance and management come together. A demographic approach to entrepreneurship may unravel various components of the spatio-temporal dynamics of both existing and new firms. In-depth case study research as advocated in company life history analysis is certainly necessary to identify motives and barriers concerning successful entrepreneurship, but there is also a clear need for more analytical comparative research leading to research synthesis and transferable lessons.

An interesting example of the latter type of research approach can be found in a study by Breschi (2000), who conducts a cross-sector analysis of the geography of innovative activities. Using the evolutionary concept of a technological regime he is able to identify the background factors of variations in spatial patterns of innovations, viz. knowledge base, technological opportunities, appropriability conditions and cumulativeness of technical advances. Undertaking more of such studies might advance the idea that geography counts in a modern entrepreneurial age. Cities offer important seedbed conditions for modern entrepreneurship in an open network economy, but this role is by no means exclusive. We observe at the same time local niches or shells in isolated areas which offer due protection or incubation for creative entrepreneurial abilities. Important

stimulating factors may be the presence of training and educational facilities; an open business culture; venture capital; public support; local suppliers and subcontractors; and so forth. Consequently, the geographic landscape of modern entrepreneurship is varied and calls for intensified research efforts aimed at more synthesis.

6 Entrepreneurial interactions

A new phenomenon in modern economies is the emergence of interwoven global networks (see Castells 1996) which allow for global interaction and communications, a process through which market areas may obtain worldwide coverage (e.g., through the internet). Consequently, interaction costs, transaction costs and transportation costs form an interconnected portfolio of new market opportunities (and impediments) for modern business firms. Against this background, it is plausible that communication potential and knowledge are nowadays seen as critical success factors for the 'global entrepreneur'. The pathway toward global business is not easy to find; there is no single recipe, so that learning strategies are of great importance here. To reduce the risk of misinvestments, there is much scope for collective learning strategies which manifest themselves in two configurations, viz. network participation and geographical agglomeration. At present, both forces are at work simultaneously and create the new geographic landscape at the beginning of the new millennium (see also van Geenhuizen and Ratti 2001).

Entrepreneurship means also the management of business network constellations. An interesting and rather comprehensive review of the relationship between entrepreneurship and network involvement is given by Malecki (1997b). The local environment (including its culture, knowledge base and business attitude) appears to act as a critical success factor for new forms of entrepreneurship, a finding also obtained by Camagni (1991). Apparently, the local 'milieu' offers various types of networks which tend to encourage the 'entrepreneurial act' (see Shapero 1984).

It should be emphasized that the chain entrepreneurship—competition, innovation, growth—is not a rectilinear one. Innovation is a critical factor that functions in an open multi-actor system with concurrent phases of decisions and plan implementations, where the demand side (i.e., the customer) is the driving force (see Prahalad and Ramaswamy 2004). Innovation policy at the firm level with various risks bears increasingly a resemblance to a smart portfolio management. But in the particular case of innovation, a balance has to be found between uncertain exploration and risky exploitation (March 1991). Entrepreneurs are the foundation stones of the innovation process, as they have to create new combinations of people and products, through the creation of idea generators, of product champions, of proper support, of proper support systems and mentors, of venture mechanisms and of effective gatekeepers (see also Katz 2003).

The modern information and communication technology (ICT) is a centre-piece in the rise of both local and global networks. ICT does not only induce faster and more reliable communications, but prompts also a change in firm interaction, management practice, labour acquisition and spatial structure of entrepreneurship (see Beuthe et al. 2004). In addition, ICT favours both business-to-business commerce and business-to-consumer commerce. The use of Internet and e-commerce mean a significant and

historically unprecedented rise in productivity, a phenomenon that can be ascribed to network externality theory, which explains increasing returns, first-mover advantages and coordination advantages (see e.g., Economides 1996; Wigand 1997; van Geenhuizen and Nijkamp 2004). It is clear that creative entrepreneurship finds nowadays its roots in the modern ICT sector which induces a clear knowledge orientation.

Malecki and Poehling (1999), have given a very valuable review of the literature on this issue; learning-by-doing, supported by inter-firm network collaboration, enhances the competitive potential of new firm initiatives. They observe a variety of network configurations, such as suppliers or customer networks, local networks of neighbouring firms, professional networks and knowledge networks, which all may contribute to a better entrepreneurial performance. Empirical research in this area, however, is still scarce and there would be scope for more systematic comparative investigations into the knowledge drivers of modern entrepreneurship. It is certainly true that information and knowledge are important asset in an enterprise, but the economic evaluation of such knowledge (e.g., as a private good or a public good with a non-rivalry character) needs to be studied more thoroughly (see Shane and Venkataraman 2000).

An interesting illustration of the importance of local networks for new firm formation can be found in the literature on ethnic entrepreneurship (see Waldinger 1996). Many cities in a modern industrialized world are confronted with a large influx of foreign migrants (see, for example, Baycan-Levent, Nijkamp and Sahin 2009; Borjas 1992, 1995; Brezis and Temin 1997; Gorter, Nijkamp and Poot 1998; McManus 1990). The socioeconomic problems involved have created an enormous tension and have prompted many policy initiatives on housing, job creation, education, etc. But the successes of such policies have not yet been impressive. The seedbed conditions for active economic participation are often weak, as a result of low levels of skill, language deficiencies, cultural gaps and stigmatization. One of the more recent promising efforts has been to favour ethnic entrepreneurship, so that sociocultural minorities, through a system of self-employment, might be able to improve their less favoured position. Ethnic entrepreneurship has different appearances, e.g., production for the indigenous ethnic market or low skilled activities, but increasingly we see also an upgrading of the ethnic production sector (e.g., shops, software firms, consultancy).

In a survey study, van Delft, Gorter and Nijkamp (2000) demonstrate that the access to and use of local support networks is a critical success factor for various urban policy programmes addressing the new immigrants. Such networks may relate to socio-economic support, provision of venture capital or access to the urban community at large. The importance of social bonds and kinship relationships is also emphasized by several other authors (for instance, Boyd 1989; Chiswick and Miller 1996; Borooah and Hart 1999). In general, such networks appear to create various externalities in terms of entrepreneurial spirit, search for opportunities, self-organization and self-education, and business information and access to local markets.

But it is noteworthy that such network connections are geared toward the geographical space in which ethnic entrepreneurs operate. It should be added that in most cities ethnic networks are not uniform, but reflect local cultures from the country of origin. Many ethnic entrepreneurs operate in volatile markets and, although network participation is needed to cope with many market uncertainties, business or social networks are usually not sufficient to survive in a competitive environment (see Barrett, Jones and McEvoy

1996). There is a need for more thorough empirical research on the motives and performance of ethnic entrepreneurs (see also Masurel et al. 2002).

7 Concluding remarks

This paper on entrepreneurship and regional development rests on two strands of literature in regional economics, viz. regional growth theory and entrepreneurship/innovation theory. In the past these two mainstream theories have developed in a rather disjoint way, but more recently we have witnessed a clear tendency towards cohesion and integration (see Capello and Nijkamp 2009). This new direction emerged mainly from two origins, viz. more emphasis on the micro foundations for regional economic growth and the introduction of network theory as an integrating paradigm for spatial-economic dynamics.

Regional growth theory has already a long standing history in both regional economic and welfare theory. Neoclassical growth theory has provided an important cornerstone for our understanding of the drivers of regional development; it has acted as an analytical framework in which also learning principles—and other productivity-enhancing played a crucial role. In the past decades these contributions have been complemented with endogenous growth theory in which the determinants of economic growth (e.g., infrastructure, knowledge systems, technology) were no longer seen as external forces, but as important vehicles for growth that could be influenced by explicit and deliberate policy choices of both public and private actors. Furthermore, the new economic geography provided another complement, viz. the importance of agglomeration economies in the space-economy, in particular in the context of monopolistic competition. These new directions have prompted more applied work on spatial convergence in a multiregional system. They have also stimulated a badly needed research shift towards more realism in applied regional economic research, in particular in areas such as: accessibility, economies of scale, sustainability, proximity, monopolistic competition, knowledge systems, and innovation. In the new research trend a much more prominent place was given to the importance of entrepreneurship.

In this modern research framework the entrepreneur is increasingly conceived of as the critical change agent who has to reach the highest performance in a competitive system. He has to face externalities of various kinds (e.g., in industrial districts), but he is also the creator of new initiatives, as is witnessed in the current innovation literature. From a spatial perspective he has to excel in terms of local embeddedness, global orientation, exploitation of proximity advantages, use of clustering and network principles, and access to advanced knowledge circuits.

New research would have to address in particular the following issues:

- The question how locational choices of entrepreneurs (including the decision to stay at the same location) are linked to innovation theory;
- The seedbed conditions for the creation of new entrepreneurs (in particular, the development of a multidisciplinary-oriented production function for entrepreneurs); and

- The impact assessment of contextual factors (such as local leadership, institutional support systems, entrepreneurial culture, trust principles, etc.) on the emergence of successively local and regional entrepreneurship.

It goes without saying that the next years to come will call for a full-scale attention of entrepreneurship research in regional development analysis. Entrepreneurship and regional development prompt indeed a rich variety of research questions to regional scientists. It is a domain where industrial organization, cultural geography, location theory, business economies and technology form an intertwined nexus. From a macro or global perspective, the region is a strategic niche in a global development. But from a micro perspective, the region is shaped by innovative actions of risk-seeking entrepreneurs. Competition, trust, network organization and public policy are ingredients for win-win situations at local level.

Our review of this complex field has clearly demonstrated the linkages of the theme of 'entrepreneurship and regional development' to other research domains, such as network theory, spatial externalities, cultural-behavioural theory, innovation theory and endogenous growth theory. From a dynamic entrepreneurial and regional growth theory, the interwoven connection of entrepreneurial life cycles, industrial life cycles and (multi)regional life cycles is a fascinating research issue, not only from a theoretical viewpoint, but also from an applied modelling perspective. A particularly fascinating and policy-relevant question is then how knowledge investments and spillovers are related to dynamic spatial processes. It goes without saying that in this field still a wealth of research questions and answers are waiting to be tackled. From this perspective, there is a great need for creative combined micro-meso-macro growth analyses at a regional level. Quantitative modelling has so far not kept pace with the research challenges in the past decade.

References

- Abreu, M. (2005). *Spatial Determinants of Economic Growth and Technology Diffusion*. Amsterdam: Tinbergen Institute.
- Acemoglu, D., S. Johnson, and J. A. Robinson (2001). 'The Colonial Origins of Comparative Development'. *American Economic Review*, 91 (5): 1369-401.
- Acs, Z. (ed.) (1994). *Regional Innovation, Knowledge and Global Change*. London: Frances Pinter.
- Acs, Z. (2002). *Innovation and the Growth of Cities*. Cheltenham: Edward Elgar.
- Acs, Z. J., and D. B. Audretsch (1990). *Innovation and Small Firms*. Cambridge, MA: MIT Press.
- Acs, Z. J., H. L. F. de Groot, and P. Nijkamp (eds) (2002). *The Emergence of the Knowledge Economy*. Berlin/New York: Springer.
- Amin, A. (1993). 'The Globalization of the Economy: An Erosion of Regional Networks?'. In G. Grabher (ed.), *The Embedded Firm: On the Socioeconomics of Industrial Networks*. London: Routledge, 278-95.
- Asheim, B., P. Cooke, and R. Martin (eds) (2006). *Clusters and Regional Development*. London: Routledge.

- Audretsch, D. B., and A. R. Thurik (eds) (1999). *Innovation, Industry Evolution and Employment*. Cambridge: Cambridge University Press.
- Barrett, G., T. Jones, and D. McEvoy (1996). 'Ethnic Minority Business: Theoretical Discourse in Britain and North America'. *Urban Studies*, 33 (4/5): 783-809.
- Barro, R. (1991). 'Economic Growth in a Cross Section of Countries'. *Quarterly Journal of Economics*, 106 (2), 407-43.
- Baycan-Levent, T., P. Nijkamp, and M. Sahin (2009). 'New Orientations in Ethnic Entrepreneurship: Motivation, Goals and Strategies of New Generation Ethnic Entrepreneurs'. *International Journal of Foresight and Innovation Policy*, 5 (1-3): 83-112.
- Bertuglia, C. S., S. Lombardo, and P. Nijkamp (eds) (1997). *Innovative Behaviour in Space and Time*. Berlin, Heidelberg and New York: Springer
- Beuthe, M., V. Himanen, A. Reggiani, and L. Zamparini (eds) (2004). *Transport, Development and Innovation in an Evolving World*. Berlin, Heidelberg and New York: Springer.
- Boekema, F., K. Morgan, S. Bakkers, and R. Rutten (eds) (2000). *Knowledge, Innovation and Economic Growth*. Cheltenham: Edward Elgar.
- Bögenhold, D. (2004). 'Entrepreneurship: Multiple Meaning and Consequences'. *International Journal of Entrepreneurship and Innovation Management*, 4 (1): 3-10.
- Borjas, G. (1992). 'Ethnic Capital and Intergenerational Mobility'. *Quarterly Journal of Economics*, 107 (1): 123-50.
- Borjas, G. (1995). 'Ethnicity, Neighbourhoods and Human Capital Externalities'. *American Economic Review*, 85 (3): 365-90.
- Borooah, V. K., and M. Hart (1999). 'Factors Affecting Self-Employment among Indian and Caribbean Men in Britain'. *Small Business Economics*, 13: 111-29.
- Boyd, M. (1989). 'Family and Personal Networks in International Migration: Recent Developments and New Agendas'. *International Migration Review*, 23 (3): 638-70.
- Breschi, S. (2000). 'The Geography of Innovation: A Cross-Sector Analysis'. *Regional Studies*, 34 (3): 111-34.
- Brezis, E. S., and P. Temin (eds) (1997). *Elites, Minorities and Economic Growth*. Amsterdam: North-Holland.
- Brons, M., and P. H. Pellenbarg (2003). 'Economy, Culture and Entrepreneurship in a Spatial Context'. In T. Marszal (ed.), *Spatial Aspects of Entrepreneurship*. Warsaw: Polish Academy of Sciences, 11-36.
- Brüderl, J., and R. Schussler (1990). 'Organizational Mortality'. *Administrative Science Quarterly*, 35: 530-7.
- Cairncross, F. (1997). *The Death of Distance*. Boston: Harvard Business School Press.
- Camagni, R. (1991). *Innovation Networks: Spatial Perspectives*. London: Belhaven Press.
- Campbell, J. (1997). 'Knowledge Management in the Virtual Enterprise'. In J. Jackson and J. V. D. van der Wielen (eds), *Proceedings of the Second International*

- Workshop on Telework*. Tilburg: Work and Organization Research Center, Tilburg University. Publisher, 15-25.
- Capello, R. (2002). 'Entrepreneurship and Spatial Externalities: Theory and Measurement'. *Annals of Regional Science*, 36 (3): 387-402.
- Capello, R., and P. Nijkamp (eds) (2009). *Handbook of Regional Growth and Development Theories*. Cheltenham: Edward Elgar (forthcoming).
- Carree, M. A., and A. R. Thurik (2003). 'The Impact of Entrepreneurship on Economic Growth'. In Z. J. Acs and D. B. Audretsch (eds), *Handbook of Entrepreneurship Research*. Dordrecht: Kluwer.
- Carroll, G. R., and M. T. Hannan (2000). *The Demography of Corporations and Industries*. Princeton, NJ: Princeton University Press.
- Castells, M. (1996). *The Rise of the Network Society*. London: Blackwell.
- Caves, R. E. (1998). 'Industrial Organization and New Findings on the Turnover and Mobility of Firms'. *Journal of Economic Literature*, 36 (4): 1947-82.
- Chell, E., J. M. Hawarth, and S. Brearley (1991). *The Entrepreneurial Personality: Concepts, Cases and Categories*. London: Routledge.
- Chiswick, B. R., and P. W. Miller (1996). 'Ethnic Networks and Language Proficiency among Immigrants'. *Journal of Population Economics*, 9 (1): 19-35.
- Coase, R. H. (1937). 'Some Notes on Monopoly Price'. *Review of Economic Studies*, 5 (1): 17-31.
- Cooke, S., and M. Morgan (1993). 'The Network Paradigm: New Departures in Corporate and Regional Development'. *Environment and Planning D: Society and Space*, 11: 543-64.
- Danson, M. W. (1995). 'New Firm Formation and Regional Economic Development'. *Small Business Economics*, 7: 81-7.
- Dasgupta, P. (1988). 'Trust as a Commodity'. In D. Gambetta (ed.), *Trust; Making and Breaking Cooperative Relations*. Oxford: Basil Blackwell, 49-72.
- Davelaar, E. J. (1991). *Incubation and Innovation: A Spatial Perspective*. Aldershot: Ashgate.
- Davidsson, P. (1995). 'Culture Structure and Regional Levels of Entrepreneurship'. *Entrepreneurship and Regional Development*, 7 (1): 41-62.
- Deakins, D. (1999). *Entrepreneurship and Small Firms*. London: McGraw Hill.
- Drennan, M. P. (2002). *The Information Economy and American Cities*. Baltimore: Johns Hopkins University Press.
- Economides, N. (1996). 'Network Externalities, Complementarities and Innovation'. *European Journal of Political Economy*, 12 (2): 211-33.
- Evans, D. (1987). 'The Relationship Between Firm Growth, Size and Age'. *Journal of Industrial Economics*, 35 (4): 567-81.
- European Commission (2002). 'Observatory of European SMEs'. Available at: www.ec.europa.eu/enterprise/library/lib-entrepreneurship/series_observatory.htm
- Fischer, M. M., and J. Fröhlich (eds) (2001). *Knowledge, Complexity and Innovation System*. Berlin: Springer-Verlag.

- Fischer, M. M., and A. Varga (2003). 'Spatial Knowledge Spillovers and University Research'. *Annals of Regional Science*, 37 (2): 303-22.
- Fischer, M. M., and P. Nijkamp (2008). 'Entrepreneurship and Regional Development'. In R. Capello and P. Nijkamp (eds), *Handbook of Regional Growth and Development*. Cheltenham: Edward Elgar.
- Fischer, M. M., T. Scherngell, and E. Jansenberger (2006). 'The Geography of Knowledge Spillovers between High-Technology Firms in Europe. Evidence from a Spatial Interaction Modelling Perspective'. *Geographical Analysis*, 38 (3): 288-309.
- Florida, R. (2002). *The Rise of the Creative Class*. New York: Basic Books.
- Foss, N. J., and P. G. Klein (eds) (2002). *Entrepreneurship and the Firm*. Cheltenham: Edward Elgar.
- Galbraith, J. K. (1967). *The New Industrial State*. London: Routledge.
- Gallup, J. L., J. D. Sachs, and A. D. Mellinger (1999). 'Geography and Economic Development'. NBER Working Paper 6849. Cambridge, MA: National Bureau of Economic Research.
- Gertler, M. (1988). 'The Limits of Flexibility: Comments on the Post-Fordist Vision of Production and its Geography'. *Transactions of the Institute of British Geographers*, 17: 410-32.
- Gordon, I. R., and P. McCann (2000). 'Industrial Clusters: Complexes Agglomeration and/or Social Networks'. *Urban Studies*, 37 (3): 513-32.
- Gorter, C., P. Nijkamp, and J. Poot (eds) (1998). *Crossing Borders*. Ashgate: Aldershot
- Granovetter, M. S. (1985). 'Economic Action and Social Structure: The Problem of Embeddedness'. *American Journal of Sociology*, 91 (3): 481-510.
- Hagen, J. M., and S. Choe (1998). 'Trust in Japanese Interfirm Relations: Institutional Sanctions Matter'. *Academy of Management Review*, 23: 589-600.
- Hale, R., and P. Whitlam (1997). *Towards the Virtual Organization*. London: McGraw-Hill.
- Hall, R. E., and C. Jones (1999). 'Why Do Some Countries Produce so Much More Output per Head than Others'. *Quarterly Journal of Economics*, 10: 463-83.
- Hayter, R. (1997). *The Dynamics of Industrial Location*. Chichester: John Wiley.
- Hébert, R. M., and A. N. Link (1989). 'In Search of the Meaning of Entrepreneurship'. *Small Business Economics*, (1) 1: 39-49.
- Helpman, E. (2004). *The Mystery of Economic Growth*. Cambridge: Belknap Press.
- Katz, R. (2003). *The Human Side of Managing Technological Innovation*. Oxford: Oxford University Press.
- Knight, F. H. (1921). *Risk, Uncertainty and Profit*. New York: Houghton Mifflin.
- Kolko, J. (2002). 'Silicon Mountains, Silicon Molehills: Geographic Concentration and Convergence of Internet Industries in the US'. *Information Economics and Policy*, 14: 211-32.
- Kormendi, R., and P. Meguire (1985). 'Macroeconomic Determinants of Growth'. *Journal of Monetary Economics*, 16 (4): 141-63.

- Legendijk, A., and P. Oinas (2005). *Proximity, Distance and Diversity*. Aldershot: Ashgate.
- Lee, S. Y., R. Florida, and Z. J. Acs (2004). 'Creativity and Entrepreneurship: A Regional Analysis of New Firm Formation'. *Regional Studies*, 38 (8): 879-89.
- Leone, R. A., and R. Struyck (1976). 'The Incubator Hypothesis: Evidence from Five SMSAs'. *Urban Studies*, 13 (3): 325-31.
- Lever, W. F. (2002). 'Correlating the Knowledge-Base of Cities with Economic Growth'. *Urban Studies*, 39 (5-6): 859-70.
- Linders, G. J., H. de Groot, and P. Nijkamp (2005). 'Economic Development, Institutions and Trust'. In R. Boschma and R. Kloosterman (eds), *Learning from Clusters*. Dordrecht: Springer, 111-37.
- Lundvall, B. (ed.) (1992). *National Systems of Innovation*. London: Pinter.
- Maillat, D. (1995). 'Territorial Dynamics, Innovative Milieus and Regional Policy'. *Entrepreneurship and Regional Development*, 7 (2): 157-65.
- Marsili, O. (2001). *The Anatomy and Evolution of Industries: Technological Change and Industrial Dynamics*. Cheltenham: Edward Elgar.
- Malecki, E. J. (1997a). *Technology and Economic Development*. Harlow: Addison Wesley Longman.
- Malecki, E. J. (1997b). 'Entrepreneurs, Networks, and Economic Development'. In J. A. Katz (ed.), *Advances in Entrepreneurship, Firm Emergence and Growth*, vol. 3. Stamford, CT: Jai Press, 57-118.
- Malecki, E. J., and R. M. Poehling (1999). 'Extroverts and Introverts: Small Manufactures and their Information Sources'. *Entrepreneurship and Regional Development*, 11: 247-68.
- Marshall, A. (1890). *Principles of Economics*. London: Macmillan.
- Masurel, E., P. Nijkamp, M. Tastan, and G. Vindigni (2002). 'Motivations and Performance Conditions for Ethnic Entrepreneurship'. *Growth and Change*, 33 (2): 238-60.
- McGrath, R. G., I. C. MacMillan, and S. Scheinberg (1992). 'Elitists, Risk-Takers, and Rugged Individualists? An Exploratory Analysis of Cultural Differences between Entrepreneurs and Non-Entrepreneurs'. *Journal of Business Venturing*, 7: 115-35.
- McManus, W. S. (1990). 'Labour Market Effects of Language Enclaves'. *Journal of Human Resources*, 25 (2): 228-52.
- Mehlum, H., K. Moene, and R. Torvik (2003). 'Predator or Prey? Parasitic Enterprises in Economic Development'. *European Economic Review*, 47 (2): 275-94.
- Mintzberg, H. (1978). 'Patterns of Strategy Formation'. *Management Science*, 36: 934-48.
- Morgan, K. (1991). 'Competition and Collaboration in Electronics: What Are the Prospects for Britain?'. *Environment and Planning A*, 23: 1459-82.
- Nelson, R. R., and S. G. Winter (1982). *An Evolutionary Theory of Economic Changes*, Cambridge MA: Harvard University Press.

- Nijkamp, P. (2003). 'Entrepreneurship in a Modern Network Economy'. *Regional Studies*, 37 (4): 395-405.
- Nijkamp, P., and J. Poot (1997). 'Endogenous Technological Change, Long-Run Growth and Spatial Interdependence: A Survey'. In C. Bertuglia, S. Lombardi and P. Nijkamp (eds), *Innovative Behaviour in Time and Space*. Heidelberg: Springer, 213-38 .
- Nijkamp, P., and J. Poot (1998). 'Spatial Perspectives on New Theories of Economic Growth'. *Annals of Regional Science*, 32 (1): 7-37.
- Nijkamp, P., and R. Stough (eds) (2002). 'Entrepreneurship and Regional Economic Development'. *Annals of Regional Science*, 36 (3): 369-71.
- Noorman, A. (2002). 'Flexibele Specialisatie en Virtuele Organisaties'. Amsterdam: VU University. Master's Thesis.
- Norton, R. D. (2001). *Creating the New Economy*. Cheltenham: Edward Elgar.
- Oakey, R. (ed.) (1996). *New Technology-Based Firms in the 1990s*. London: Paul Chapman.
- European Commission (2002). 'Observatory of Regional SMEs 2002, No. 3. Regional Clusters in Europe'. Brussels: European Commission. Available at: www.planotecnologico.pt/document/regional_clusters_europe.pdf.
- OECD (Organization for Economic Cooperation and Development) (1989). *Mechanisms for Job Creation: Lessons from the United States*. Paris: OECD.
- OECD (1998). *Fostering Entrepreneurship*. Paris: OECD.
- Pettigrew, A., and R. Whipp (1991). *Managing Change for Competitive Success*. Oxford: Blackwell.
- Pineder, M. (2001). *Entrepreneurial Competition and Industrial Location*. Cheltenham: Edward Elgar.
- Piore, M. J., and C. F. Sabel (1984). *The Second Industrial Divide: Possibilities for Prosperity*. New York: Basic Books.
- Porter, M. (2000). 'Location, Competition and Economic Development; Local Clusters in the Global Economy'. *Economic Development Quarterly*, 14 (1): 15-31.
- Porter, M. (2003). 'The Economic Performance of Regions'. *Regional Studies*, 37 (6/7): 549-78.
- Prahalad, C. K., and V. Ramaswamy (2004). *The Future of Competition*. Boston: Harvard Business School Press.
- Pred, A. (1977). *City-Systems in Advanced Economies*. London: Hutchinson.
- Preissl, B., and L. Solimene (2003). *The Dynamics of Clusters and Innovation*. Berlin: Springer-Verlag.
- Rabellotti, R. (1997). *External Economies and Cooperation in Industrial Districts*. London: MacMillan.
- Reggiani, A., and P. Nijkamp (eds) (2006). *Spatial Dynamics, Networks and Modelling*. Cheltenham: Edward Elgar.
- Roberts, E. B. (1991). *Entrepreneurs in High Technology*. New York: Oxford University Press.

- Roller, R., and L. Waverman (2001). 'Telecommunications Infrastructure and Economic Development: A Simultaneous Approach'. *American Economic Review*, 91 (4): 909-23.
- Roper, S. (2001). 'Innovation, Networks and Plant Location: Some Evidence for Ireland'. *Regional Studies*, 36 (3): 373-86.
- Sabel, C. F., and J. Zeitlin (1985). 'Historical Alternatives to Mass Production: Politics, Markets and Technology in Nineteenth Century Industrialization'. *Past and Present*, 108: 133-76.
- Schultz, T. W. (1980). 'Investment in Entrepreneurial Ability'. *Scandinavian Journal of Economics*, 82: 437-48.
- Schumpeter, J. (1934). *The Theory of Economic Development*. Cambridge, MA: Harvard University Press.
- Scott, A. J., and M. Storper (2003). 'Regions, Globalization and Development'. *Regional Studies*, 37 (6/7): 579-93.
- Shane, S. (2003). *A General Theory of Entrepreneurship*. Cheltenham: Edward Elgar.
- Shane, S., and S. Venkataraman (2000). 'The Promise of Entrepreneurship as a Field of Research'. *Academic Management Review*, 96: 98-121.
- Shapiro, A. (1984). 'The Entrepreneurial Event'. In C. A. Kent (ed.), *The Environment for Entrepreneurship*. Lexington, MA: Lexington Books, 21-40.
- Siegfried, J. J., and L. B. Evans (1994). 'Empirical Studies of Entry and Exit'. *Review of Industrial Organization*, 9 (2): 121-55.
- Smith, M. P. (2001). *Transnational Urbanism: Locating Globalization*. Oxford: Blackwell.
- Stam, E. (2003). 'Why Butterflies Don't Leave'. Utrecht: University of Utrecht. PhD thesis.
- Stinchcombe, A. L., M. S. MacDill, and D. Walker (1968). 'Demography of Organizations'. *American Journal of Sociology*, 74 (3): 221-9.
- Storper, M. (1993). 'Regional "Worlds" of Production: Learning and Innovation in the Technology Districts of France, Italy and the USA'. *Regional Studies*, 27: 433-55.
- Storper, M., and A. J. Scott (1989). 'The Geographical Foundations and Social Regulation of Flexible Production Complexes'. In J. Wolch and M. Dear (eds), *The Power of Geography: How Territory Shapes Social Life*. Boston, MA: Unwin Hyman, 61-83.
- Stough, R. (2003). 'Strategic Management of Places and Policy'. *Annals of Regional Science*, 37 (2): 179-202.
- Stough, R., R. Kukarni, and J. Paelinck (2002). 'ICT and Knowledge Challenges for Entrepreneurs in Regional Economic Development'. In Z. J. Acs, H. L. F. de Groot and P. Nijkamp (eds), *The Emergence of the Knowledge Economy. A Regional Perspective*. Berlin: Springer-Verlag, 195-214.
- Suarez-Villa, L. (1989). *The Evolution of Regional Economies: Entrepreneurship and Macroeconomic Change*. New York: Praeger.

- Suarez-Villa, L. (1996). 'Innovative Capacity, Infrastructure and Regional Policy'. In D. F. Batten and C. Karlsson (eds), *Infrastructure and the Complexity of Economic Development*. Berlin: Springer, 251-70.
- Thompson, W. R. (1968). 'Internal and External Factors in the Development of Urban Economies'. In H. S. Perloff and L. Wingo (eds), *Issues in Urban Economics*. Baltimore, MD: The Johns Hopkins University Press, 43-60.
- Upton, D. M., and A. McAfee (1996). 'The Real Virtual Factory'. *Harvard Business Review*, July-August: 199.
- van Delft, H., C. Gorter, and P. Nijkamp (2000). 'In Search of Ethnic Entrepreneurship Opportunities in the City: A Comparative Study'. *Environment and Planning C*, 18 (4): 429-51.
- van Geenhuizen, M. (1993). 'A Longitudinal Analysis of the Growth of Firms'. Rotterdam: Erasmus University. PhD thesis.
- van Geenhuizen, M., and G. A. van der Knaap (1994). 'Dutch Textile Industry in a Global Economy'. *Journal of Regional Studies*, 28 (7): 695-711.
- van Geenhuizen, M., and P. Nijkamp (1995). 'A Demographic Approach to Firm Dynamics'. Serie Research Memoranda, 25. Amsterdam: Department of Economics, Free University.
- van Geenhuizen, M., and R. Ratti (eds) (2001). *Gaining Advantage from Open Borders*. Aldershot: Ashgate.
- van Geenhuizen, M., and P. Nijkamp (2004). 'In Search of Urban Futures in the E-Economy'. In M. Beuthe, V. Himanen, A. Reggiani and L. Zamparini (eds), *Transport, Development and Innovation in an Evolving World*. Berlin: Springer, 64-83.
- van Oort, F. G. (2004). *Urban Growth and Innovation*. Aldershot: Ashgate.
- van Wissen, L. J. G. (2000). 'A Micro-Simulation Model of Firms: Applications of the Concept of the Demography of Firms'. *Papers in Regional Science*, 79: 111-34.
- Waldinger, R. (1996). *Still the Promised City?* Cambridge, MA: Harvard University Press.
- Wennekers, S., and R. Thurik (1999). 'Linking Entrepreneurship and Economic Growth'. *Small Business Economics*, 13 (1): 27-55.
- Wigand, R. (1997). 'Electronic Commerce'. *The Information Society*, 13 (1): 1-16.
- Williamson, O. (1985). *The Economic Institutions of Capitalism*. New York: The Free Press.
- Windrum, P., and P. Koch (eds) (2008). *Innovation in Public Sector Services*. Cheltenham: Edward Elgar.
- You, J. (1995). 'Critical Survey: Small Firms in Economic Theory'. *Cambridge Journal of Economics*, 20: 441-62.