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Entrepreneurship in a modern network economy

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ENTREPRENEURSHIP IN A MODERN NETWORK ECONOMY

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Abstract

In this survey paper the literature on entrepreneurship is summarised from the perspective of geographical **seedbed** conditions and network constellations. We argue that urban areas offer favourable incubator conditions for innovative entrepreneurship, as a result of economies of density and the opportunities created by the city as a nucleus of a broader network. We conclude that a modern entrepreneur tends to become increasingly a network operator and manager.

1. Entrepreneurship in Perspective

Competition is the seedbed of the entrepreneurial spirit and the driving force of modern economies. It is based on the strive for survival by individual firms who have to operate as efficiently as possible. 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 has been more fully developed a century ago by Marshall. A really pathbreaking contribution to the analysis of entrepreneurship from a broad historical perspective has been 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, also the circular equilibrium will 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 after a disturbance in the original equilibrium position.

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 (see for a review Bertuglia et al. 1998). Regions 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. The conventional comparative advantage perspective on regions is not sufficient anymore 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 success factors. This awareness has had important implications for regional growth theory (see for an overview also Nijkamp and Poot 1998).

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 a world-wide coverage (e.g., through the Internet). Consequently, interaction costs, transaction costs

and transportation costs form an interconnected portfolio of new market opportunities for modern business firms. Against this background, it is plausible that communication potential and knowledge are 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.

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 is not automatically emerging from the seeds of technological innovation as 'manna from heaven', but is the result of deliberate actions and choices of various stakeholders, including the government. Government policy is however, 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 are created for successful entrepreneurial performance.

The entrepreneur is thus back on the scene. But his strategies may be entirely different from those in the past, as the institutional and technological environment of entrepreneurship has drastically changed. To put these modern strategies more in perspective, we will first offer in the next section a concise historical overview of the position of the entrepreneur in economic-historical thinking.

2. The Entrepreneur in Economic History

In a recent textbook on economics (Stiglitz and Driffill 2000), the entrepreneur is defined as a person who creates new businesses, brings new products to market, or develops new processes of production. This concise and simplified description does not do full justice to the wealth of literature on the history of economic thinking where the vibrant role of the entrepreneur has been extensively discussed.

The role of the entrepreneur in economic development has been a source of much scientific inspiration and research since the early history of economics. Important features of entrepreneurship were *inter alia* the degree of risk-taking by a firm, the innovative attitude of a firm, the degree of profit orientation by a firm and

the long-range spin-off of business activities. In their standard work on *'The Entrepreneur'* Hébert and Link (1982) make the following typological classification of the 'species' of entrepreneur:

1. The entrepreneur is the person who assumes the risk associated with uncertainty (e.g. Cantillon, Von Thünen, Mill, Hawley, Knight, Von Mises, Cole, Shackle)
2. The entrepreneur is the person who supplies financial capital (e.g. Smith, Böhm-Bawerk, Pigou, Von Mises)
3. The entrepreneur is an innovator (e.g. Bentham, Von Thünen, Schmoller, Sombart, Weber, Schumpeter, Shackle)
4. The entrepreneur is a decision maker (e.g. Cantillon, Menger, Marshall, Wieser, Amasa Walker, Francis Walker, Keynes, Von Mises, Cole, Schultz)
5. The entrepreneur is an industrial leader (e.g. Say, Saint-Simon, Amasa Walker, Francis Walker, Marshall, Wieser, Sombart, Weber, Schumpeter)
6. The entrepreneur is a manager or superintendent (e.g. Say, Mill, Marshall, Menger)
7. The entrepreneur is an organiser and co-ordinator of economic resources (e.g. Say, Wieser, Sombart, Weber, Clark, Davenport, Schumpeter, Coase)
8. The entrepreneur is the owner of an enterprise (e.g. Quesnay, Wieser, Pigou, Hawley)
9. The entrepreneur is an employer of factors of production (e.g. Amasa Walker, Francis Walker, Wieser, Keynes)
10. The entrepreneur is a contractor (e.g. Bentham)
11. The entrepreneur is an 'arbitrageur' (e.g. Cantillon, Walras, Kirzner)
12. The entrepreneur is an allocator of resources among alternative uses (e.g. Cantillon, Schultz).

Apparently, entrepreneurship is a multi-faceted phenomenon that can be viewed from different angles. Based on this long list of possible characteristics of the entrepreneur, one may argue that in the literature the following four main issues centring around entrepreneurship come generally to the fore (see also Hébert and Link 1982, Van Praag 1996, 1998, and Van Dijk and Thurik 1998):

- The position of the entrepreneur both in the surrounding economic system and within his own corporate organisation
- The identification of the economic tasks of the entrepreneur

- The financial remuneration of the entrepreneur for his risk-taking activities, based on his economic motives
- The dynamics in (local and global) markets, seen from the perspective of the entrepreneur.

These four attributes of an entrepreneur show up with varying intensities in the literature on the essence of entrepreneurship. We will address concisely here the scientific contributions on entrepreneurship offered by Cantillon, Say, Marshall, Schumpeter, Knight and Kirzner, respectively.

The pioneering study of *Cantillon* (1931) on the role of entrepreneurship made a main distinction between the following economic agents: (i) *land owners* who were financially independent, (ii) *'arbitrageurs (entrepreneurs)'* who were involved in risk-taking activities with a view to profit-making, and (iii) *'servants'* who were ensured of a fairly stable income by means of a labour contract. In Cantillon's view, the market economy was a 'self-regulating network of reciprocal exchange arrangements' which were able to produce equilibrium prices through free entry and exit of business firms. In Cantillon's perception of entrepreneurship, the mediating role of the economic actor, who needs to anticipate uncertain future events and to see uncertainty as an economic opportunity, is more important than his innovative attitude. The 'survival of the fittest' would be best guaranteed by those entrepreneurs who know how to handle risk situations properly.

A more modern view on entrepreneurship was advocated by *Say*, who identified the entrepreneur as a co-ordinating manager in the production and distribution process of goods, through which welfare for society was created. The degree of welfare creation by the entrepreneur (be it in agriculture, industrial production or trade) was dependent on three factors: (i) the generation of theoretical knowledge on production and distribution; (ii) the application of this knowledge to real-world practices; and (iii) the implementation of production and distribution processes. In Say's view: "*The application of knowledge to the creation of a product for human consumption is the entrepreneur's occupation*" (Say 1803, p.330). Clearly, this knowledge was not of a generic nature, but had to be focused on the creation of welfare by means of entrepreneurial activity. Interestingly enough, risk-taking behaviour is in Say's view less important for entrepreneurship than the application of

proper knowledge leading to good business judgement. Such qualities are rare, and hence 'the survival of the fittest' means that only a limited number of successful entrepreneurs is left in the market. This scarcity situation may also explain the high financial remuneration for good entrepreneurs. It is noteworthy, that the restructuring role of an entrepreneur in a dynamic economy was much less recognised by Say.

Based on a neoclassical perspective, *Marshall* (1890) has focused due attention on the specific properties of entrepreneurship, more than other neoclassical economists in whose view perfect information, free competition and similar economic objectives would apply to all business behaviour. In Marshall's view the entrepreneur is a 'superintendent': the main task of the entrepreneur is to offer good products, while he may also focus on innovative strategies and economic progress. The entrepreneur is responsible for the proper functioning of his business. For that purpose he should have general abilities (such as a good memory, reliability, flexibility etc.) and specialised abilities (such as good foresight, proper judgement and leadership). In Marshall's conception of the economic world the business enterprise is mainly functioning in a static context; the 'survival of the fittest' is mainly determined by the remuneration for entrepreneurship relative to the financial rewards from other occupations.

A radically new perspective was offered by *Schumpeter*. Changes in economic systems were in his view not only the result of external (contextual) changes, but also of endogenous forces. The intrinsic dynamics of an economic system is caused by the entrepreneur (Ripsas 1998). Based on his 'circular economy' concept, he argues that growth and progress will be hampered in a static economic system. A breakthrough will be created by innovative entrepreneurship, through which - by a process of 'creative destruction' - static conditions will be changed, leading to a new equilibrium. The entrepreneur is not a manager, but an innovator. Successful innovative behaviour is essentially based on entrepreneurial spirit and intelligence. To quote Schumpeter: "*Everyone is an entrepreneur only when he actually 'carries out new combinations' and loses that character as soon as he has built up his business, when he settles down to running it as other people run their business*" (Schumpeter 1934, p.78). It is interesting to observe that risk-taking as an explicit attribute of entrepreneurship is not explicitly emphasised by Schumpeter, perhaps because in his view risk is more limited to financial risks than to a broader set of entrepreneurial challenges to be faced by the company.

More emphasis on risk behaviour was laid by *Knight*. He made a distinction between risks that could be insured and those that could not. In his view the main mission of the entrepreneur is to decide *what* has to be done and *how* things have to be done, without having perfect information on future situations. The lack of insight may thus relate to *risk* situations (which may be analysed by standard statistical procedures) and *uncertainties* (which often have a unique character). Knight states in this context: “*In the first place, goods are produced for a market, on the basis of an entirely impersonal prediction of wants, not for the satisfaction of the wants of the producers themselves. The producer takes the responsibility for forecasting the consumers’ wants*” (Knight 1921, p.268). The proper management of ‘real’ uncertainty is in the core business of the entrepreneur. In addition, the entrepreneur needs to have sufficient financial resources, courage, self-confidence, creativeness and foresight. Whether or not someone would decide to become an entrepreneur, would be dependent on the relative financial revenues for this task compared to those originating from other tasks.

In his study on ‘*Competition and Entrepreneurship*’, *Kirzner* (1973) offers a sharp criticism on the neoclassical world by questioning the assumptions of perfect information and equilibrium prices. He emphasises the presence of asymmetric information leading to various forms of market disequilibrium. Good entrepreneurship is based on the ability to adequately deal with these ‘anomalies’. To be successful however, it is necessary to have a specific type of entrepreneurial knowledge: “*knowing where to look for knowledge!*” He called this “*the highest order of knowledge*”. The entrepreneur need not be rich, but has to be alert, viz. to have the ability to **recognise** profit opportunities under uncertain conditions.

Since the 1980s we have witnessed an almost explosive interest in entrepreneurship, in particular from the perspective of innovative behaviour (see for a review Cunningham and Lischeron 1991). It is noteworthy that especially the small and medium size sector (SME) has received much attention in the ‘entrepreneurial age’, as a result of vertical integration of large **firms**, the shift from manufacturing to service industries, the strategic downsizing of large corporations, and the flexible adjustment potential of small size firms (Harrison 1994). Even though empirical facts on the glory of entrepreneurialism were subject to criticism (Nodoushani and Nodoushani 1999), the idea of the creative entrepreneur – or the ‘entrepreneurial

hero' – has been pervasive in the SME literature (Reich 1987). In recent years we have seen very dynamic patterns of firm behaviour as a result of technological innovation and globalisation, reflected inter alia in flexible specialisation, corporate restructuring and new world-wide industrial networks (Harrison and Kelley 1993). As a result the industrial organisation has drastically changed, for instance, an orientation towards industrial districts and specialised geographical clusters (e.g., the Third Italy). Networking and flexible specialisation have become closely interwoven phenomena, but these phenomena take place in a geographic force field of regions or cities. The intricate embeddedness of modern enterprises in global networks has also challenged the position of the 'entrepreneurial hero'. Modern entrepreneurship is increasingly focussed on organising a complex force field influenced by many (internal and external) stakeholders (see Ackoff 1990). In a way one might even speak of a democratisation of entrepreneurship.

In conclusion, entrepreneurship is a multi-faceted phenomenon that plays a central role in market economy. The risks of entrepreneurship can be mitigated by an orientation towards a support system offered by the urbanisation economies in geographical space.

3. Drivers of Modern Entrepreneurship

After the discussion of the essential features and peculiarities of the 'entrepreneurial animal', we will now turn to the question of the drivers of entrepreneurship. The popularity of the 'new pioneer' (Petzinger 1999) or 'entrepreneurial hero' prompts an investigation into the determinants of creative entrepreneurship (cf. Tasthan 2000). The literature does not offer an unambiguous explanation, but suggests at least three complementary factors which may be used in an explanatory framework. These factors are: personal motivation, social environment and external business culture. They will now concisely be discussed.

Personal motivation

Which are the driving forces for an individual to become entrepreneur? In a survey article Homaday and Vesper (1982) have identified several characteristics which may be seen as the determining psychological factors for entrepreneurship. These are:

- *need for achievement*. This is a traditional argument already dealt with by McClelland (1961) in his book on 'The Achieving Society'. This attitude is found among people who want to be personally responsible for the resolution of problems, for the implementation of strategies and for the formulation of goals. It should be added that such a strong motivation does not always lead to successful entrepreneurship.
- *locus of control*. The degree to which an individual thinks to be able to influence the outcomes of business activities is another determining factor. The management control may relate to both internal and external factors (see Shapero 1984).
- *risk taking*. Entrepreneurship means risk taking. There is of course always a trade-off between profitability and financial risk, but this is not a simple relationship. Risks form a multi-faceted portfolio of financial, socio-economic, personal and managerial uncertainties, so that 'calculated risks' may be difficult to identify.

Clearly, the above-discussed psychological approach has also been severely criticised, as empirical research has demonstrated that the relative presence of these motivational factors can also be found among non-entrepreneurs or unsuccessful entrepreneurs. Stevenson and Sahlman (1985) conclude therefore: "*Finally, while many have purported to find statistically significant common characteristics of entrepreneurs, the ability to attribute causality to these factors is seriously in doubt.*"

Social environment

The social 'milieu' appears to be another determining factor for entrepreneurship. Shapero (1984) has distinguished four factors in this context:

- *displacement*. Examples of the displacement motive are loss of job, dissatisfaction with present job, discrimination, migration or social unrest (see Ndoen 2000). These are mainly push factors. In case of displacement with choice options also pull factors may play a role for the individual (such as new market opportunities, completion of a study etc.)
- *disposition to act*. This motive originates from the wish to change one's position in order to be independent, to develop one's own career pattern etc.

- *credibility*. This factor may be important as a start-up motive, which may be related to the need to receive recognition in a business environment.
- *availability of resources*. This driving force is essentially more a prerequisite for a start-up, in terms of financial support, tax exemptions, subsidies etc.

The above 'milieu' factors play in many cases a significant role, but they appear to be neither necessary nor sufficient for successful entrepreneurship. Thus this model is not able to offer a complete or unambiguous specification of a complicated choice process (Choenni 1997).

External business culture

Entrepreneurship is historically also determined by cultural and political factors (Baumol 1990). If financial rewards or power are the ultimate goal of an individual, then it might count to enter, for instance, politics rather than the industry (like in the ancient Roman period). A low societal appreciation for entrepreneurship may lead to a low entry rate of start-up firms. If the recognition profile of successful entrepreneurs is high, we may see a huge interest in entering the business sector.

Also other external factors may play a decisive role, e.g. technological changes. This can be illustrated by the share of ICT business start-ups in recent years. Similarly, structural changes in industrial composition and organisation, shifts in the labour market, changes in institutional and governmental structures or socio-demographic changes may encourage entrepreneurship as well (see e.g. Acs 1994, Baumol 1990, Brock and Evans 1989 and Evans and Leighton 1989).

The step towards entrepreneurship is certainly a complicated and multi-dimensional phenomenon. There are apparently necessary conditions, desirable conditions and facilitating conditions. This complex array calls for further empirical research.

In retrospect, the above concise descriptions of the role of and motives for entrepreneurship have brought to light that in general the role of the entrepreneur is concerned with a proper treatment of uncertainty and with the need to explore new endeavours, to initiate creative and innovative strategies, and to collect and deploy new knowledge. Spatially discriminating opportunities and impediments however,

have mainly been overlooked in these considerations. This also holds for the role of spatial public policy. It is surprising to observe that the geography of entrepreneurship has indeed received far less attention. Therefore, in the next section a few observations on the spatial aspects of entrepreneurship will be offered.

4. Entrepreneurship in Spatio-Temporal Context

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 Briiderl and Schusserl (1990), Carroll and Hannan (2000) and Siegfried and Evans (1994). Many studies on growth processes of firms originate from industrial economics or organisation and management disciplines, often complemented with notions from geography, demography, or psychology (e.g. Caves 1998, Evans 1987, Gertler 1988, Hayter 1997, or Stinchcombe 1968).

The roots of this new approach can be found in the 1980s when in a period of economic recession much attention was given to the birth of new firms. From a regional economic perspective much research was undertaken on the geographical differentiation in the birth and growth process of new firms (see e.g. Keeble and Wever 1986, Oakey 1993, Storey 1994, Suarez-Villa 1996, and Sutton 1998).

The predominant focus on new firm formation tended to neglect the **spatio-temporal** dynamics of incumbent firms, in particular the way they survive, grow or decline. From that perspective also the role of the adoption of new technology had to receive due attention (see e.g. Davelaar 1991, Abernathy et al. 1983, Nooteboom 1993, Pettigrew and Whipp 1991, and Storper and Scott 1989). This has also prompted several studies on the life cycles of firms (in particular, competitive performance, product differentiation, spatial relocation, organisational restructuring etc). There are various reasons why of all types of firm dynamics, new firm formation has attracted much concern (cf. 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 ought to be **recognised** that newly established firms face relatively large risks, due to lack of organisational experience and cohesion. As a consequence, the death rate among start-ups is relatively high and tends to decrease over time. Many 'entrepreneurial hero's' appear to die at a young age. It is clear that successful new enterprises in a geographical area contribute significantly to economic 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 (cf. Acs 1994).

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 emphasised that organisations develop, stabilise 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. Organisations 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.

It is a widely held belief that a metropolitan environment offers favourable incubator conditions for creative entrepreneurship, as in this setting the conditions for proper human resource management (e.g., by means of **specialised** training and educational institutes) and **labour** recruitment are most favourable (see e.g. Davelaar 1991, Leone and Struyck 1976, Pred 1977 or Thompson 1968). But it ought to be

recognised that also various non-metropolitan areas 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 localised learning mechanisms, based on a dynamic territorial interplay between actors in a coherent production system, local culture, tradition and experiences (cf. Camagni 1991, Ratti 1992, Storper 1992, 1993). This view comes close to the one which puts a strong emphasis on the trend for localisation. Advocates of the latter idea adhere to a vertically disintegrated and locationally fixed production, based on a shift to flexible specialisation. The empirical evidence 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 is without doubt, the pervasiveness of the trend for flexible specialisation and concomitant localisation is not sufficiently proven (cf. Van Geenhuizen and Van der Knaap 1994; Gertler 1988). Aside from a trend towards localisation there is a trend towards globalisation, associated with the growing influence of multinational corporations and their global networking with smaller firms (cf. Amin 1993).

In the light of the previous observations it may plausible be argued that modern entrepreneurship is based on associate skills of a varied nature. An entrepreneur is certainly an opportunity seeker but in so doing he needs to have an open eye 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 comes 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 recent study by Breschi (2000), who conducted a cross-sector analysis of the geography of innovative activities. Using the evolutionary concept of a technological regime he was 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.

5. Entrepreneurship and Networks

Entrepreneurship means also the management of business network constellations. An interesting review of the relationship between entrepreneurship and network involvement has been given by Malecki (1997). The local environment (including its culture, knowledge base, and business attitude) appears to act often 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' (cf. Shapero 1984).

In the Schumpeterian view the entrepreneur is seeking for new combinations while destroying in a creative way existing constellations. This highly risk-taking behaviour can however, be ameliorated by externalising some of the risks through participation or involvement in local or broader industrial networks. In general, the urban climate offers many possibilities for strategic network involvement, either material or virtual. In this way, the real entrepreneur tends to become an organiser of change. The early urban economics literature (Hoover and Vernon 1959) has already spelt out the great potential of urban industrial districts for creative entrepreneurship (see for a review of the incubation literature Davelaar 1991). Also in the sociologically-oriented writings of Jane Jacobs (19..) we observe similar arguments. Apparently, urban modes of life create scale economies which favour the rise of new enterprises. To some extent, this idea was already propagated by Marshall (1890), who introduced the concept of industrial districts which generated an enormous economic growth potential (see also Amin and Thrift 1992, Markusen 1996, and Paci and Usai 2000). In general, vertical disintegration in combination with network strategies at a local level may induce a resurgence of Marshallian districts as self-contained local networks of creative economic development.

Networks may, in general, relate to physical configurations (such as aviation networks, road networks, railway networks or telecommunication networks) or to virtual networks (such as industrial clubs, knowledge networks or information networks). Such networks may have a local character, but may also extend towards global levels. All such networks tend to create industrial diversity, entrepreneurial spirit and resource mobilisation (see also Andersson 1985 and Van de Ven 1993). In

general, local inter-firm networks may be seen as supporting mechanisms for new forms of creative entrepreneurship, as such networks are a blend of openness (necessary for competition) and protection (needed for an 'infant industry'). It may be interesting to quote here the final conclusions of Malecki (1997): "*Thus, it is difficult for any 'recipe' from one place to work when transplanted into another place, with its unique culture, traditions, capabilities, and networks*" (p. 98).

In the context of endogenous growth theory an intense debate has started on the way regions and governments can stimulate local economic growth. Following the seminal contributions by Lucas (1988) and Romer (1986), a wide interest has emerged in the critical conditions for modern economic growth (see e.g. Aghion and Howitt 1998, Barro and Sala-i-Martin 1995, Bluestone and Harrison 2000, Dixit and Stiglitz 1977, Helpman 1992, Kirzner 1997, Nijkamp and Poot 1998).

An important element in the discussion on endogenous growth concerned the role of knowledge and knowledge networks. The foundation for the theory of knowledge use was essentially laid several decades back by Arrow (1962) and Solow (1956, 1957) who advocated the significance of learning mechanisms for increasing productivity.

From the perspective of a business environment, information and knowledge is a *sine qua non* for entrepreneurial success, not only for large-scale companies but also for SMEs. 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 customers 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 is however, 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 is an 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). The potential benefits of up-to-date information may be high, but knowledge acquisition also has its costs. As Soete (2000) argues: "*But of course there are costs in acquiring knowledge. It explains why markets for exchange of knowledge are rare and why firms prefer in principle to*

carry out Research and Development in-house rather than have it contracted out or licensed. It also provides a rationale for policies focusing on the importance of investment in knowledge accumulation. Such investments are likely to have high so-called 'social' rates of return, often much higher than the private rate of return. Investment in knowledge cannot be simply left to the market"

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 industrialised world are confronted with a large influx of foreign migrants (see e.g. Borjas 1992, 1995, Brezis and Temin 1997, Gorter et al. 1998, McManus 1990, and Yap 1997). The socio-economic problems involved have created an enormous tension and have prompted many policy initiatives on housing, job creation, education etc. One of the more recent promising efforts has been to favour ethnic entrepreneurship, so that through a system of self-employment socio-cultural minorities might be able to improve their less favoured position. In a recent survey study, Van Delft et al. (2000) have demonstrated 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 has also been emphasised by several other authors (for instance, Boyd 1989, Chiswick and Miller 1996, and Ndoen 2000). In general, such networks appear to create various externalities in terms of entrepreneurial spirit, search for opportunities, self-organisation 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.

6. Concluding Remarks

The history of economic thinking has demonstrated a fluctuating interest in entrepreneurship. In the past decades we have seen much emphasis on the innovative role of the entrepreneur, while more recently a trend can be observed in which the entrepreneur is conceived of as a network operator or manager. Clearly, changing patterns of economic life have had a decisive influence on views on entrepreneurship.

The 'network entrepreneur' needs specific skills in terms of information processing, international access, alertness to world market developments, and search

for partnership. Metropolitan environments appear to offer fruitful conditions for network behaviour, as a result of economies of density, suitable communication modes and associative cultures (including a scientific environment). Large-scale companies are usually able to manage complex world-wide interactions, but for firms in the SME sector quite a few hurdles have to be taken in terms of training, network access, marketing channel choice, e-commerce opportunities, and inter-firm cooperation. An urban environment with an abundance of formal and informal contacts may then offer a protective shell for new ventures. It seems therefore plausible that the rise of the network society will (continue to) favour urban modes of operation for creative entrepreneurship. The entrepreneurial role model seems to find promising seedbeds in urban cultures.

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