CESIS Electronic Working Paper Series

Paper No. 338

Determinants of entrepreneurship. Is it all about the individual or the region?

Mikaela Backman
Charlie Karlsson

December, 2013

The Royal Institute of technology
Centre of Excellence for Science and Innovation Studies (CESIS)
http://www.cesis.se

Determinants of entrepreneurship. Is it all about the individual or the region?

Authors:
Mikaela Backman*
Charlie Karlsson[Ψ]

Abstract: It is well established at whatever spatial level studied that economic actors exhibit a strong tendency to cluster. Despite this fact many explanations to entrepreneurship only considers the personal characteristics of entrepreneurs. This is certainly not a satisfactory state-of-the-art. It is obvious that the influence of spatial factors must be considered carefully. In this paper we illustrate empirically that variations in the rate of entrepreneurship are explained not only in terms of characteristics of entrepreneurs, such as education, sector of employment, occupation, experience and income but also by the characteristics of i) the localities where they worked before they became entrepreneurs, ii) the localities where they currently started their firm and iii) the regions where these localities are situated. The characteristics of localities include size, population density, firm density and type of locality (metropolitan, urban, semi-rural or rural). The estimations use a multi-level approach to decipher the how much of the variance that can be explained by the different levels (individual, locality and region). The data used in this study is micro-level data for Sweden provided by Statistics Sweden.

Keywords: entrepreneurship, individual attributes, regional attributes, networks, micro-level, multi-level

JEL Codes: C21, J24, L26, R12

[Ψ] Jönköping International Business School, P. O. Box 1026, SE-551 11 Jönköping, Sweden

* Corresponding author, Centre for Entrepreneurship and Spatial Economics(CEnSE), Jönköping International Business School, P. O. Box 1026, SE-551 11 Jönköping, Sweden, Fax: +46 (0) 36 12 18 32 mikaela.backman@jibs.hj.se,

1. Introduction

Entrepreneurs are major change agents in the economy by bringing new ideas to different market places (Wong, Ho & Autio, 2005) and entrepreneurship involves "the dynamic process of new firm formation and growth [that] creates new owners and jobs, thereby creating and distributing wealth" (Kirchhoff,1994, 3). It is a well-established fact that entrepreneurs have a strong tendency to cluster spatially, whatever spatial scale used. It is against this background remarkable and intriguing that mainstream entrepreneurship research has showed so little interest for this empirical fact and mostly focused on the demographics and personality traits of entrepreneurs disregarding the potential influence of the spatial context on the volume and type of entrepreneurship (cf. Parker, 2009, who only devotes three pages to regional factors).[1] This bias in entrepreneurship research is really astonishing given that it often is claimed by entrepreneurship researchers that there are three factors can be used as general explanations of the behaviour of potential entrepreneurs: demographics, personal traits and contextual factors (Teixeira, 2008), where the contextual factors includes broader influences such as social, institutional and economic factors. Certainly, many researchers within regional science have analysed the role of the spatial context for the clustering of entrepreneurship. Unfortunately, many of these studies have been suffering from a lack of suitable micro-level data at a fine spatial scale. Hence, we still lack solid empirical evidence and knowledge about the drivers behind the clustering of entrepreneurs at finer spatial scales. However, it is well established that potential entrepreneurs overwhelmingly tend to start their firms where they live. This implies that spatial sorting of potential entrepreneurs is obviously not the critical factor behind the empirically observed clustering of entrepreneurs.

If we exclude the spatial sorting hypothesis, we have to turn to the alternative explanation that we here have to do with the influence of agglomerative factors. Certainly, we must expect that different agglomerative forces are working at different spatial levels.

The purpose of this paper is to analyse the role of spatial factors in explaining the level of entrepreneurship, i.e. new firm formation, in different localities in Sweden, controlling for important characteristics of individuals (entrepreneurs as well as non-entrepreneurs) including their commuting behaviour. If the economic milieu did not matter, entrepreneurs would be randomly scattered over geographical space and we would not be able to observe any systematic clustering that could be explained by the characteristics of the spatial economic milieu. Hence, the economic milieu is of vital importance if we want to understand the drivers of entrepreneurship. We also intend to analyse how important different aspects are for new firm formation and self-employment, i.e. how much of the variance between localities that can be explained by characteristics of individuals and the spatial economic milieu, relatively.

We are in this paper interested in those agglomerative forces that can be expected to be the drivers of the clustering of entrepreneurship. What then is the influence of agglomerative forces? To put structure to the discussion, we distinguish between agglomerative forces

[1] One exception is Sternberg (2011) but his overview is unfortunately relatively short.

working at the local level and those working at the regional level. The local level concerns localities where the average travel time between two points by car is approximately 10-12 minutes. The regional level, on the other hand, concerns larger localities where the average travel time between two points by car is approximately 30-40 minutes. This implies that the local level allows for several face-to-face interactions per day, while the regional level normally allows for only one face-to-face interaction per day (cf. Johansson, et al., 2002).

I this paper, we use the finest administrative level in Sweden, namely the municipality level, as our definition of a locality. Sweden is divided into 290 municipalities. Municipalities in Sweden have a substantial political freedom to take decisions that influence the local conditions and business climate relevant for firms and for potential entrepreneurs (cf. Teece, 1986). Since there is a substantial commuting between municipalities, we make a distinction between the municipality where the entrepreneur resided before he/she became an entrepreneur – the home municipality – and the municipality where he/she worked before he became an entrepreneur – the work municipality. Of course, in many cases his home municipality and the work municipality is the same. We think that the home and work municipalities are important for potential entrepreneurs since they in many cases provide the professional and private networks that often are critical for starting but also running a new firm. We also incorporate the economic opportunities and the economic milieus within a commuting distance for the home and the work municipality, i.e. the respective labour market regions.

All municipalities belong to, i.e. are allocated to, a labour market region, which can be interpreted as a functional economic region. On average, a labour market region contains 3.6 municipalities but the variation between the metropolitan regions and the most sparsely populated regions is substantial. The functional economic regions are in many respect self-contained offering a common labour market, a common housing market, a common market for household services, a common market for business services and inputs as well as a home market for the firms in the region. Most firms actually sell all their output in their home region. For potential entrepreneurs the functional economic region offers a supply of labour, most of the services and inputs needed to start-up and run a firm and a market potential. Since the home municipality and the work municipality can be located in different functional economic regions, we make a distinction between the home region and the work region. In most cases, of course, the home region and the work region is the same. Based upon the above we can group people into three groups: i) those who live and work in the same municipality, i.e. short-distance commuters, ii) those who live in one municipality and work in another municipality in the same labour market region, i.e. medium-distance commuters, and iii) those who live in a municipality in one labour market region and who work in a municipality in another labour market region, i.e. long-distance commuters. Finally, we control for the background characteristics of the new entrepreneurs in terms of age, education, experience, income, occupation and sector.

Our results show that controlling for the background characteristics of new entrepreneurs, such as education, experience, occupation and gender the following spatial factors contribute to explain new firm formation in Sweden:

- At the municipal level: i) population density in work and home municipality, ii) accessibility to self-employed (but for commuters only accessibility to self-employed in the work municipality), and iii) for commuters the human capital intensity in the work municipality[2].
- At the labour market region level: i) accessibility to self-employed in the own region for those that work and live in the same region, ii) the share of firms in knowledge-intensive business firms has a positive effect for those that live and work in the same municipality, iii) the share of knowledge-intensive firms in the work region for those that commute between regions and, iv) the human capital intensity in the home region for those that commute between regions.

The paper is structured as follows: In Section 2 we discuss at a general level the relationship between entrepreneurship and spatial economic milieu. The supply of entrepreneurial human capital in different localities is our focus in Section 3 and in particular we stress the role of local private and professional networks. Section 4 is devoted to a discussion about the demand and supply factors that together with historical conditions determine the supply of entrepreneurial opportunities in different localities. The data we use, the definition of the variables we use as well as the results of our empirical estimations are presented in Section 5. Section 6 concludes.

2. Entrepreneurship and spatial economic milieu

Fundamentally, entrepreneurship research concerns the discovery, evaluation and exploitation of opportunities in the market place (Shane & Venkataraman, 2000; Baker, Gedajlovic & Lubatkin, 2005). There exists today a rich literature on the relationship between the characteristics of individuals and their willingness to become entrepreneurs, i.e. to start a firm or to become self-employed. However, we start with presenting the general decision problem that in principle every potential entrepreneur faces and will after that discuss how agglomerative forces might influence the decisions of potential entrepreneurs. Our basic assumption is that potential entrepreneurs are well-informed, rational and risk-neutral decision-makers, who will decide to start a new business if this is the best of all available alternatives in terms of expected financial outcome. We assume that the fundamental motivation for entrepreneurs is the economic gain, even if a number of other motivations have been suggested in the entrepreneurship literature (Jayawarna et al. 2013). If a new business is not profitable, it will fail whatever the underlying motivation for launching it. Based upon the above assumption the decision problem can be illustrated as follows (Nyström 2006):

$$\left\{\int_0^L [E(p_t)E(q_t) - E(q_t)E(c_t)]e^{-\delta t}dt - E(F)\right\}[1 - E(\tau_e)] \geq \int_0^L E\left(\hat{Y}_t\right)e^{-\delta t}\,dt[1 - E(\tau_Y)] + \varepsilon$$

[2] For commuters that commute between labour market regions also the human capital intensity in the home municipality has a positive effect on new firm formation.

where $E(p_t)$ is the expected price for the product provided by the new firm, $E(q_t)$ is the expected sales volume, $E(c_t)$ is the expected unit cost for producing and distributing the product, $E(F)$ is the expected start-up cost, $E(\tau_e)$ is the expected tax on firm profits, $E(\hat{Y}_t)$ is the expected income from the best alternative if the potential entrepreneur decides not to start a new firm, $E(\tau_Y)$ is the expected tax on the alternative income, ε is the compensation that the potential entrepreneur demands for taking the risk of starting a firm, δ is the depreciation ratio, L is the expected life time of the firm, and $e^{-\delta t}$ is the discount factor of future incomes and costs. When the left hand side is larger than the right hand side a potential entrepreneur will start a new business. If the two sides are equal, we cannot know what the decision will be.

Entrepreneurship is a question about exploiting entrepreneurial opportunities. Different spatial economic milieus differ in terms of the number (and quality) of entrepreneurial opportunities they offer during each time period and the individuals in these different economic milieus differ in their entrepreneurial capacity to identify, to evaluate and to exploit these entrepreneurial opportunities (Karlsson & Gråsjö, 2013). Each period a number of entrepreneurial opportunities are identified in each locality. The identified opportunities are evaluated and in those cases where the evaluation is positive, the opportunity will be exploited. The extent to which will happen in each locality is a function of the prevailing entrepreneurial capacity in each location. For each new period, the set of entrepreneurial opportunities will change due to the exploitation of some entrepreneurial opportunities. However, during the same period, some existing entrepreneurial opportunities disappear and others emerge due to changes on the demand side, on the supply side, in the knowledge stock, of institutions, regulations and policies, and of infrastructures. Since different localities are affected differently by such changes, different localities might experience quite different patterns in terms of the number (and quality) of entrepreneurial opportunities over time.

The entrepreneurial capacity of the individuals in every locality is a function of their entrepreneurial human capital, i.e., their accumulation of know-how, know-why, skills, and abilities relevant and needed for discovering, evaluating, and acting on entrepreneurial opportunities and managing newly started firms. The entrepreneurial capital has a general component and a specific component relevant only for specific technologies, industries, and markets. At each period in each locality there are only a certain number of individuals equipped with the right volume and type of entrepreneurial human capital that generate the alertness (Kirzner, 1973 & 1979) to detect entrepreneurial opportunities worthwhile pursuing, and the ability to deal with the uncertainty that entrepreneurial acts involve by necessity (Knight, 1921). [3]

Since human beings are semi-immobile and tend to spend extended periods in each locality where they live, it is obvious that the pertinent regional economic, social and cultural milieus will distinctly influence the entrepreneurial human capital of different individuals. For exam-

[3] Uncertainty is inherent in entrepreneurial acts since the knowledge, in particular of the future that entrepreneurs possess by necessity is imperfect (Keirstad, 1957).

ple, some such milieus are characterized by frequent entrepreneurial events, i.e. entrepreneurial experiments, and this implies that these milieus offer better opportunities to build up entrepreneurial human capital and not least entrepreneurial skills (Hansen, 2001) than other milieus with relatively few entrepreneurial experiments. Furthermore, the type of the entrepreneurial experiments differ between localities, which implies that different localities induce differences in terms of from which industries, technologies, markets, etc. that potential entrepreneurs can learn.

The above implies that individuals that detect the same entrepreneurial opportunity might evaluate it differently because they most probably possess different entrepreneurial human capital. The same entrepreneurial opportunity might also be evaluated differently in different localities by individuals possessing the same entrepreneurial human capital due to differences in demand, supply, institutional and infrastructure conditions between different localities.

The above discussion implies that the level of entrepreneurship in different localities is a function of the supply (and quality) of entrepreneurial human capital and the supply of entrepreneurial opportunities. In the sequel, we will discuss the factors that determine the supply of entrepreneurial human capital and the supply of entrepreneurial opportunities in different localities.

3. The supply of entrepreneurial human capital

The entrepreneurial human capital of individuals is a function of their demographic and personal traits, i.e., their background and up-bringing, their general and specific education and training and the general and specific learning that they have accumulated via their different work and other life experiences, via media, such as the Internet, and through the interaction with other people including entrepreneurs privately and professionally via various private and professional networks. While the accumulated entrepreneurial capital probably is critical to evaluate, act on and manage a new business, we assume that the current private and professional networks might be critical for identifying entrepreneurial opportunities. Thus, to understand how the existing level of human capital influences the probability that potential entrepreneurs become entrepreneurs is a function of on the one hand their personal characteristics, which are a function of a cumulative accumulation process and on the other hand the extent to which they currently are integrated in different private and professional networks.

3.1 Characteristics of individual and entrepreneurial human capital

We have no intention and no possibilities in this study to measure the entrepreneurial human capital of individuals. Instead, we rely on using a number of proxy variables, which we claim can function as indicators of the level of entrepreneurial human capital of different individuals. These proxy variables include:

- age (but that the relationship has the form of an inverted U),

- level of education
- type of education
- length of experience
- having varied experiences
- being occupied in certain types of occupations of the non-routine type (Bacolod, Blum & Strange, 2009)
- having been an entrepreneur before
- being a man
- being of certain ethnic origins
- being unemployed

There are also other characteristics of individuals that determine their probability and capability to become entrepreneurs. It is well known that their personality traits are important but in this study, we have no information about personality traits. We also know that their income level and their personal wealth are important. The presence of greater personal wealth and new firm formation are positively related with each other (Reynolds, Miller & Maki, 1995). Unfortunately, we have no information about personal wealth of the individuals in this study.

3.2 Entrepreneurship and local private and professional networks

The local level as interpreted here is a level that allows for much networking via professional and social face-to-face interactions and thus to over time build up strong and rich professional as well as personal networks. We claim that the local level may play a critical role for entrepreneurship. The reason is that it is the level that might provide role models for potential entrepreneurs and offer general and professional acceptance of entrepreneurial endeavours as well as an environment conducive to entrepreneurial activity. The local level is also critical from another aspect, since there may exist information and knowledge asymmetries between localities due to the existence of differences in information and knowledge corridors and processes that channel information and knowledge to potential entrepreneurs (Shane, 2000; Baker, Gedajlovic & Lubatkin, 2005). Both Hayek (1945) and Kirzner (1973) have suggested that differences in entrepreneurial behaviour may arise from information and knowledge asymmetries across potential entrepreneurs.

Denser localities, i.e. localities where people have clustered spatially, offer better conditions for personal contacts and social and professional interactions, which over time may develop mutual trust among partners reducing the costs of interaction, transferring information and knowledge, cooperating and doing business (Goldstein & Gronberg, 1984). Love & Roper (2001) stress that the potential for such proximity effects is likely to be greater in urbanised or metropolitan areas, i.e. in denser areas. Generally, the available empirical evidences on cross-regional differences in various outcomes tend to be difficult to explain without taking human capital in account as well as the tendency for knowledge to spill over between individuals through face-to-face interaction (Gennaioli, et al., 2013). These knowledge spillovers generate human capital externalities, a phenomenon identified already by Marshall (1920), when he

noted that knowledge was in the air as it was transferred from one individual to another. Several empirical studies have found that knowledge spillovers tend to be greater in regions with a higher population and industrial density exploiting a competitive advantage of urban areas (Brunello & De Paola, 2004: Audretsch & Lehmann, 2005; Audretsch & Keilbach, 2007).

Glaeser (1999) refer to human capital externalities as the product of spontaneous meetings between people with complementary skill sets. Due to the tyranny of distance most professional and social interactions take place rather close to place of work and place of residence since the probability of them taking place depreciates sharply with distance, which implies that learning to a high extent is localised (Rosenthal & Strange, 2008). This implies that dense localities have a comparative advantage in the sense that they offer more opportunities for professional and social interactions within the time budgets of individuals. The volume and type of professional and social interactions in a locality is also a function of the supply and types of social capital in the locality (Karlsson, 2012). Social capital is here conceived as a system of shared values and beliefs that can prevent opportunistic behaviour by favouring trust building and cooperation among people (Putnam, Leonardi & Nanetti, 1993).

The extent to which learning in general and entrepreneurial learning in particular takes place is among other things a function of the absorptive capacity of individuals, i.e. their ability to internalise information and knowledge and to use it for commercial ends (Cohen & Levinthal, 1990) and the extent to which the individuals involved have complementary skill and knowledge sets. The higher the cognitive distance of people, the higher the dynamic transaction costs (Langlois, 1992), i.e. the costs of persuading, negotiating and coordinating with, and learning from others. This in particular affects potential entrepreneurs who have limited financial and time resources to bear such costs. We claim that differences in professional and social interactions between different localities generating substantial spatial differences in accessibility to the critical information and knowledge may explain differences in the rate of entrepreneurship between localities.

Professional and social interactions play a role when some peer group (Scheinkman, 2008) affects the actions of individuals. It seems to be well established in the literature that professional and social networks often are critical in inducing people to consider an entrepreneurial career by providing entrepreneurial role models, in smoothing the start-up process for potential entrepreneurs as well as for running newly started firms with a profit (Andersson & Larsson, 2013). A person that have entrepreneurs in the family or who knows entrepreneurs seems to have a higher propensity to consider a career as entrepreneurs. In addition, active entrepreneurs might have identified possible entrepreneurial ventures that they themselves for different reasons are not interested in pursuing and might be willing to transfer their business ideas to other people that they think could be good entrepreneurs. People living in an entrepreneurial environment might be induced to become entrepreneurs seeing the examples set by others or they might feel forced to become entrepreneurs to become socially accepted. In both case this can be interpreted as that they will demand a lower risk premium than people living in less entrepreneurial milieus and/or use a lower discount factor.

Local networks may provide information and advice that reduce the start-up costs of new firms. This is true for all the processes that a potential entrepreneur has to go through before starting a firm, such as product development, market intelligence and marketing, creating the firm as a legal entity, finding and renting facilities and equipment, hiring employees, and setting up an accounting system. The local networks may also help in finding the necessary financial resources. A potential entrepreneur who via network links are known by potential financiers might find it easier to get access to finance since the problem with asymmetric information is reduced. Several authors stress that individuals with embedded relationships and networks in the local environment are most likely to get seed and long-term capital (Uzzi, 1999; Porter, 2000; Gompers & Lerner, 2001). The local networks may also help identifying customers and markets with the necessary purchasing power, organizing the production and distribution at a reasonable cost level, etc., and thus contributing to the new firm reaching break-even within a reasonable time horizon.

Individuals have personal and professional networks in both their home region and their work region and our intention in this paper is to test the relative importance of "home locality networks" and "work locality networks". Jacobs (1969) claims that human capital externalities develop in close proximity to the work place but we think that there also are strong reasons to believe that they also develop in close proximity to place of living, not least since there normally exist a strong segregation in housing areas. People tend to live close to peoples with similar characteristics. We are not able to identify directly the relevant peer groups (Scheinkman, 2008) or to observe these personal and professional networks and are thus forced to use proxy variables. We assume that the intra-municipal accessibility to population above the age of 15, the intra-municipal accessibility to firms and the intra-municipal accessibility to self-employed people can be used as indicators of the strength of the personal and the professional networks in both "home" and "work" municipalities.

We have no direct information about to what extent different individuals are involved in different networks but instead as a proxy we use information about the networking potential in the locality where an individual works and the locality where the individual lives. This can be but does not need to be the same locality. We assume that individuals that have one work locality and one "home" locality potentially dispose of richer private and professional networks. We also test for if having the work locality in another region, i.e. being a long-distance commuter; bring extra benefits in terms of network access.

4. The supply of entrepreneurial opportunities

Regional variations of economic activities such as entrepreneurship can partly be explained by their spatial configurations and structures (Markusen, 1996; Krugman, 1998; Fujita, Krugman & Venables, 1999). Knowledge spillovers occur in particular in urban regions with agglomerations of human capital, talent and creative capacity (Karlsson, 2011; Karlsson, Johansson & Stough, 2012) where regional competition and urban variety encourages employment growth (Glaeser, et al., 1992). New businesses often emerge in clusters that supply spe-

cialized inputs and require specialised infrastructure (Porter, 2000). New firms that are spun-off from incumbents are normally found in close geographic proximity to their generic parent (Arthur, 1990), and agglomeration economies seems generally to be important for entrepreneurial ventures (Acs & Varga, 2005). The general hypothesis here is that diversified and agglomerated large urban regions generally tend to generate more entrepreneurial opportunities per 1000 population than smaller, less diverse and less dense regions.

In this section, we will discuss the factors at the regional level that are expected to influence the supply of entrepreneurial opportunities. We assume that five main types of conditions determine the supply of entrepreneurial opportunities:[4]

1. The demand conditions
2. The supply conditions
3. The transport infrastructure conditions
4. The institutional and cultural conditions[5]
5. The historical conditions

The transport infrastructure conditions determine the accessibility to output markets, customers and purchasing power. Since physical and virtual networks tend to favour industrial diversity, entrepreneurial spirit and resource mobilization (Nijkamp, 2003), it seems as if there is a synergistic relationship between infrastructure and business location. Producers tend to prefer to locate close to their suppliers to take advantage of increasing returns and to economize on transport costs (Fujita, Venables & Krugman (1999). There are evidences that new businesses prefer to locate in areas with well-developed transport services (Holl, 2004) and specialized infrastructure (Porter, 2000). We do not discuss them separately. Instead, they are discussed together with the demand and supply conditions, respectively. Of course, the institutional conditions vary between different regions. There are, for example, some national and some EU programs for which only some regions are eligible. However, we assume that the institutional and cultural differences have a minor influence and disregard them in the empirical analysis as we do cross-regional analysis. The volume of the actual programs is for example not so big that any major influence can be expected. That history matters we know not least due to Paul Krugman. We will bring up the role of the historical conditions later in this section.

4.1 The demand conditions and the supply of entrepreneurial opportunities

It is obvious that a large accessible market and a growing market are positive for the supply of entrepreneurial opportunities.

[4] Some authors also stress the supply of entrepreneurial capital (Acs & Audretsch, 2003; Audretsch, 2007). We abstain from using this concept since we find it unclear how it should be operationalized.

[5] Baker, Gedajlovic & Lubatkin (2005) argue that institutional and cultural structures influence how potential entrepreneurs evaluate entrepreneurial opportunities.

A large enough accessible market is critical for new firms to be profitable since they all have to carry a burden of fixed start-up costs. For new firms and in particular those producing distance-sensitive products the size of the accessible intra-regional market is critical (Johansson & Karlsson, 2001). For firms not producing distance-sensitive goods it is the total accessible market that matters, i.e. the sum of the accessible intra-regional market and the accessible inter-regional market. The market is made up by households and by firms. Thus, the number of accessible households and their incomes are critical, as are the number of accessible firms and the size of their budgets for buying inputs. We hypothesize that the larger the accessible markets in a region, the larger the rate of new firm formation in the region.

It seems also probable that population growth (Acs & Armington, 2006), income growth[6] and generally increasing market potentials exert a special influence on potential entrepreneurs[7] to start firms.[8] Thus, we hypothesize that growing market potentials in a region tend to stimulate the rate of new firm formation. We acknowledge that also market potentials in other regions may play a role. However, we assume that newly started firms and people that recently has become self-employed at the beginning mainly in focusing on the most accessible market, i.e. the market in the region there they live and/or work.

4.2 The supply conditions and the supply of entrepreneurial opportunities

We argue that there is a direct relationship between the supply conditions in regions and the supply of entrepreneurial opportunities. The supply conditions also determine how entrepreneurial opportunities will be evaluated and the willingness of potential entrepreneurs to act on these opportunities.

Now turning to the supply side, we acknowledge that there are spatial variations in the supply of and hence the costs of material inputs, services including transportation and labour. First, we consider the effects of localisation economies. Here we hypothesize that the higher the accessibility to firms in the own industry in a region, the higher the rate of new firm formation in the region. Alternatively, one might think that it might be the turnover in the own industry that is the critical factor for developing Marshall's three famous types of location economies (Marshall, 1920): the supply of non-tradable inputs, a common labour market, which decreases hiring and training costs, and a common pool of information and knowledge relevant for the trade.

[6] A positive association between income growth and new firms births was found by Armington and Acs (2002) and Lee; Florida & Acs (2004).

[7] Over time population, growth in regions also increases their supply of potential entrepreneurs (Acs & Armington, 2006).

[8] Several studies indicate that population growth has a positive influence on new firm formation at the regional level (Guesnier, 1994; Audretsch & Fritsch, 1994; Reynolds, Miller & Maki, 1995; Armington & Acs, 2002). However, Sutaria and Hicks (2004) did not find a significant positive association between population growth and new firm formation.

Secondly, on the supply side we need to consider the effects of urbanization economies on new firm formation. The assumption here is localities where many firms in many different industries co-locate special location advantages are generated, which reduce the costs for accessing inputs but also increase the variety and specialization of inputs. Potential entrepreneurs in such localities will have special advantages in the sense that some critical inputs there can be accessible at a lower cost but not least that they can find exactly the type of inputs they look for. Certainly, there are also extra costs for starting up in such localities in the form of higher rents for land and facilities and higher wages. Our hypothesis here is that the higher the accessibility to firms in a region, the higher the rate of new firm formation in the region. Once again, it might be that it is the accessibility to total turnover that is the critical factor.

Our third factor on the supply side concerns the specific role of the supply of business services for new firm formation. Here, we launch two hypotheses: i) the higher the accessibility to business service firms in a region, the higher the rate of new firm formation in the region, and ii) the higher the accessibility to knowledge-intensive business services in a region, the higher the rate of new firm formation in the region.

A fourth factor on the supply side concerns the role of the supply of labour for new firm formation. We assume generally that a rich and varied supply of labour in a region has a positive influence on new firm formation. Much recent research point in the direction that it, in particular, is a large and varied supply of highly educated labour that is the critical fact. Another way to test the influence on the labour supply is study the influence of differences in occupational structure on new firm formation.

We also have to consider the influence of spatial variations in specific start-up conditions. They include spatial variations in

- the access to capital (bank loans, seed money, risk capital, etc.) – Sutaria & Hicks (2004) found a positive relationship between local bank deposits per capita and new firm formation,
- the access to support services, advices, and public subsidies for potential entrepreneurs (e.g. for product development, marketing, and production),
- the access to R&D and technological infrastructure – innovations tend to be concentrated in regions well equipped with technological infrastructure (Feldman & Florida, 1994),
- the access to entrepreneurial competence[9] via peers and social interaction, which probably is a function of the level of entrepreneurship in the locality,
- the access to test markets, and
- the level of competition.

[9] Sometimes the concept 'entrepreneurship capital' is used in the literature (cf. Audretsch & Keilbach, 2004). However, we abstain from using this concept, since we find that is unclear how it can be operationalized.

4.3 The historical conditions and the supply of entrepreneurial opportunities

Every region is to a varying degree shaped by its historical development. This not only concerns its heritage in terms of infrastructure and institutions. It also concerns its industrial structure and related to that the size structure of its firms, the age structure of its population, the ethnic composition of its population, its labour force participation ratio, its employment and unemployment ratios, the competence structure of its labour force, its current knowledge stock, its capacity to generate new knowledge, its educational capacity, etc. All these factors in one way or the other will influence the supply of entrepreneurial opportunities in a region. Since, there is also substantial spatial variation in these factors it is important to control for this.

One important historical condition is the industrial structure of regions and in particular, the size distribution of existing firms. Several empirical studies have found a negative association between births of new firms and existing average firm or establishment size (Armington & Acs, 2002; Fritsch & Falck, 2002). The negative association could according to Armington & Acs (2002) be due to the existence of large firms and/or their branch plants that may hinder the formation of new firms. On the contrary, Sutaria & Hicks (2004) found a positive relationship between mean establishment size and new firm formation probably coming from the dependence of small firms on large firms. One could expect that potential entrepreneurs to be induced to start firms in regions with large firms to deliver goods and services to these firms when these firms out-source various jobs that they find inefficient to carry out in-house.

Another historical condition that might be important is cultural diversity. Some research points in the direction that regions that are culturally diverse are attractive to entrepreneurs (Saxenian, 2002; Hart & Acs, 2011). A significant positive relationship between cultural diversity and new firm formation was found by Lee, Florida & Acs (2004) and Audretsch, Dohse & Niebuhr (2010).

5. Empirical analysis

In this part, we present our empirical contribution regarding the determinants of self-employment. The empirics are based on data from Statistics Sweden. The data can be classified in different levels: the individual, establishment, the local environment (municipality) and the region (the functional region). Self-employed is measured as those individuals that change from employment to become self-employed. At the individual level, we assume that human capital characteristics (*Experience*, *Education*, *Occupation*) influence the choice of becoming self-employed. Other influential factors are the gender of the individual (*Gender*), its background (*Background*) and the income from employment (*Wage*). Several studies confirm the positive relationship between earlier experience in self-employment and the propensity to become self-employed gain (*Self-employed experience*). We also control for if the individual

have been living in the same municipality for five years (*Stayer*) to see if these individuals have a larger propensity to become self-employed, as they know the economic environment.

Different industries have different propensities of self-employment (*Industry*) which is taken into account. The size of the establishment can also affect the self-employment propensity (*Establishment size*). In addition, if the establishment has been closed down this can work as a push factor for individuals and they are more likely to become self-employed (*Establishment failure*). At the municipality and at the regional level we divide between the work and the home environment. We do however use the same variables for both the home and job environment. At the municipal level we control for agglomeration factors, such as density measured as the population density (*Pop. density*). Size is captured by a market potential measure where accessibility to wage sums is used, following Johansson et al. (2002; 2003). To capture the network effect we measure access to other self-employed in the municipality, where the number of self-employed in the municipality is discounted by a distance factor (*Network municipality*). Other networks effect can also be captured by the share of individuals with at least a bachelor degree (*Human capital municipality*) which also represents the human capital level in the municipality.

At the region level, we use the share of individuals with at least a bachelor degree to capture the overall human capital level (*Human capital region*). We also use the share of employees in knowledge intensive business services (KIBS) as a measure of the high-end business services accessibly in the region (*KIBS region*). The following table summarise the variables and gives the summary statistics. In a similar manner, we measure the network opportunities in the region as the access to self-employed within the region but outside the own municipality, discounted by distance (*Network region*).

Table 1. Description of variables and summary statistics

Description	*Indicator*	*Exp.sign*	*Mean*	*St. dev*
Dependent variable				
Change in employment status between 2007 and 2008, 1=self-employed in 2008 and employed in 2007, 0=otherwise			0.064	0.244
Independent variable (all variables are measured in 2007)				
Individual level				
Age of individual	*Experience*	+	43.061	12.562
Age square	*Experience*^{2}	-	2012.078	1096.384
Number of schooling years	*Education*	+/-	12.372	2.342
Categorization of different educational tracks (15 in total)	*Education type*			
Categorization of different occupations (10 in total, based on the two-digit SSYK code)	*Occupation*			
Dummy, 1=male, 0=female	*Gender*	+	0.521	0.499
Dummy, 1=born in Sweden, 0=otherwise	*Background*	+	0.139	0.347
Gross yearly labour income	*Wage*	+/-	2728.663	2046.117
Dummy, 1=Lived in the same municipality for the last five years, 0=otherwise	*Stayer*	+	0.798	0.402
Establishment level				
Categorization of different industries (based at the two-digit level, 86 in total) (previous work place)	*Industry*			
Number of employees (previous work place)	*Establishment size*	-	9.357	59.841
Dummy, 1= establishment failure, 0=otherwise	*Establishment failure*	+	0.032	0.177
Municipality level				

Number of inhabitants per km^2	*Pop. density*	+	130.227	440.554
Access to self-employed in the same municipality	*Network municipality*	+	732.503	1226.367
Share of municipal population with at least a bachelor degree	*Human capital municipality*	+	0.110	0.039
Region level				
Share of regional population with at least a bachelor degree	*Human capital region*	+	0.087	0.029
Share of firms in a region classified as a KIBS (two-digit SIC codes: 72-74)	*KIBS region*	+	0.242	0.349
Access to self-employed in the same region	*Network region*	+	2153.949	3626.864

[b] Calculated as the accessibility to wages (what the inhabitants that live in each municipality earn). The accessibility measure is compiled by the intra-municipal, inter-regional and extra-regional accessibility to wages accounting for distance decay effects, following Johansson et al. (2002; 2003).

We make a distinction between the economic environment where the individual live and work, at the municipal as well as the regional level. In the next table, we present the overall statistics on how many individuals live and work in the same municipality and/or region. We further show how it difference for self-employed.

Table 2. Distribution of individuals across different categories

	All individuals	Self-employed
Live and work in the same municipality	2 617 461 (67%)	215 572 (86%)
Residential municipality≠ work municipality (within the same region)	942 150 (24%)	27 136 (11%)
Residential municipality≠ work municipality (outside the residential region)	360 130 (9%)	8 497 (3%)
Total	3 919 741	251 205

The Table shows that most individuals live and work in the same municipality and above 90 per cent live and work in the same region. The figures are even higher for those that are self-employed where approximately 97 per cent live and work in the same region. In the next table, we show our results showing the determinants of self-employment across the different levels; individuals, establishments, municipality (residential and work) and region (residential and work). In the first case, we do not distinguish between the work and home municipality or region. In the other two cases however, we incorporate the economic environment in the work and the residential economic environment.

Since the dependent variable is binary a logit model is estimated, the results are presented in Table 3. The reported coefficients are the odds ratios. Odds ratio cannot be negative so a decrease is indicated by a value below one. An odds ratio above one indicates a positive impact on the probability of becoming self-employed. To reduce spatial covariance the standard errors are clustered at municipality level and measures of accessibility is used. Accessibility measures incorporate the effect from the neighbourhood municipalities and weight this impact by a distance factor. As the purpose of this paper is to evaluate the impact from the work and job environment on the propensity of self-employment, both these "levels" are included in the empirical investigation. Due to high correlation among some of the variables within the

"level" for example, population density of the residential municipality and the level of human capital, different estimations have been performed.

Table 3. Empirical results, determinants of self-employment, logit

Dependent variable: Change in employment status between 2007 and 2008, 1=self-employed in 2008 and employed in 2007, 0=otherwise

	Live and work in the same municipality	Residential municipality ≠ work municipality (within the same region)		Residential municipality ≠ work municipality (outside the residential region)	
Individual level					
Experience	1.036** (5e-4)	1.037** (0.002)		1.034** (0.002)	
Experience²	0.999** (3e-5)	0.998** (1e-4)		0.998** (1e-4)	
Education	0.966** (0.003)	0.962** (0.004)		0.959** (0.008)	
Gender	1.849** (0.026)	2.193** (0.052)		1.951** (0.081)	
Background	0.798** (0.019)	0.713** (0.021)		0.725** (0.036)	
Wage (ln)	2.384** (0.055)	1.552** (0.060)		1.352** (0.050)	
Stayer	1.435** (0.031)	1.029 (0.030)		0.746** (0.026)	
Education type	*YES*	*YES*		*YES*	
Occupation	*YES*	*YES*		*YES*	
Establishment level					
Industry	*YES*	*YES*		*YES*	
Establishment size	0.278** (0.005)	0.308** (0.010)		0.318** (0.008)	
Establishment failure	0.386** (0.008)	0.342** (0.012)		0.395** (0.031)	
Municipality level					
	Work=Home	Work	Home	Work	Home
Pop. density	0.997** (4e-4)	1.002** (4e-4)	1.000** (2e-5)	1.000** (4e-5)	1.000** (2e-5)
Network municipality	0.964** (0.009)	1.077** (0.018)	1.034 (0.021)	1.077** (0.018)	1.043 (0.038)
Human capital municipality	1.282 (0.295)	0.387* (0.143)	2.191 (1.104)	0.077** (0.046)	0.277* (0.155)
Region level					
	Work=Home	Work=Home		Work	Home
Human capital region	0.939 (0.317)	2.040 (1.560)		3.229 (2.530)	8.449** (6.004)
KIBS region	0.988** (0.005)	1.008 (0.006)		1.014** (0.005)	0.979 (0.013)
Network region	1.057** (0.009)	1.047* (0.022)		1.010 (0.018)	0.995 (0.025)
N	2 510 529	929 386		355 368	
Wald chi²	146 710	111 130		24 877	
Pseudo R²	0.47	0.39		0.33	

The reported results for those that live and work in the same municipality are for *Pop. density*, *Human capital region* and *Network region*. The reported results for those that live and work in the same region are for *Pop. density (work and home)*, *Human capital municipality*, *Network municipality*, *Human capital region* and *Network region*. The reported results for those that live and work in different region are for *Pop. density (home)*, *Human capital municipality (work and home)*, *Network municipality (home)*, *Human capital region (home)* and *Network*

*region (home and work).*The other regressors are estimated separately with the individual and establishment variables.

Looking at the results over the different categories, we observe that individual, establishment, municipal and regional factors influence the probability to become self-employed. Starting at the individual level those with more experience (i.e. individuals with a higher age) has a higher probability toe become self-employed even if the effect is marginally decreasing. These results have been confirmed by several studies (Reynolds et al. 2003: Blanchflower 2004: Wagner and Sternberg 2004: Arenius and Minniti 2005: Mueller 2006). The level of education has a negative effect on the rate to become self-employed while the previous wage level has a positive effect. This is rather surprising since the level of education and income are highly correlated. These results indicate that it is not the education level itself that pulls people to become self-employed but rather the income level. Hence, those individuals that recoup a lot from their human capital investment, i.e. education, are those that are more prone to become self-employed. Examining the immutable characteristics, men and those born outside Sweden have a higher probability to become self-employed confirming the general picture found in several studies (Borjas 1986: Le 1999: Beugelsdijk and Noorderhaven 2005). The above-mentioned individual variables do not change depending on where the individual live and work. However, there is one individual factor that changes and that is the variable that measure if the individual have stayed in the same municipality for the last five years. These *stayers* have a higher probability to become self-employed if they live and work in the same municipality, no effect if they live and work in different municipalities but within the same region and a negative impact if you live and work in different regions. These results indicate that there are differences of the economic environment where the individual lives respectively works.

If size of the establishment, where the individual used to work has a negative impact on the probability to become self-employed. Hence, individuals working at smaller establishments have a higher tendency to become self-employed. A smaller firm seems to have advantages in providing employees with the relevant experience through a closer contact with customers and hence get a better understanding of the market conditions (Mason, 1991; Fritsch, 1992; Boden, 1996). Thus, knowledge and experience for becoming self-employed are presumably best learned from previous employment experience in small firms. If the establishment has ceased to exist, there is a lower probability that the individual become self-employed. This is rather surprising since you would expect that individuals that lose their job would be more prone to become self-employed, i.e. they are pushed into becoming self-employed.

Moving to the external environment there are different effect from certain variables between those that live and work in the same location and those that do not. Starting with those that live and work in the same municipality, and hence region, we observe that the population density and network possibilities (access to individuals that are self-employed) in the municipality have a negative influence on the probability to become self-employed. Hence, this can be interpreted as the level of competition whereas locations that are dense and have a lot of self-employment discourage more individuals to become self-employed. Individuals might be intimidated and feel that there is no demand for them to fill if the level of self-employment is

already high. It should be stressed that the odds ratio is close to one for the density variable indicating that the effect is small. At the regional level, the local labour market, the share of KIBS has a diminishing effect while the network proxy implies a positive impact. The network aspect is interesting since the effect differs across different levels, negative at the local level and positive at the regional level. Individuals that live in regions that have a high rate of self-employment are motivated to become self-employed and are perhaps less intimidated by their presence. It also reflects the possible market for the self-employed where the individual target not only the local environment but the regional market.

For individuals that live and work in different municipalities we have the opportunity to observe different effect from the home respective work environment on the probability of becoming self-employed. Overall, the work environment influences the tendency to become self-employed. The density and the network in the work municipality have a positive impact on self-employment while the level of human capital has a negative influence. For the home environment, it is only the density variable that is significant but has a value of one indicating that the effect is marginal. At the regional level, it is only the network effect that is significant and implies a positive impact on becoming self-employed.

For individuals that commute over longer distances, i.e. they live and work in different regions we see the same tendency for the municipality variables as found for those that live and work in the same regions but different municipalities. The only difference is that the human capital level at the home municipality has a diminishing effect on the probability to change from being employed to become self-employed. In this case, we also have the possibility to see the difference between the regional environment where the individual live and work. In the home region, it is the level of human capital that has a positive effect on self-employment while in the work environment it is the share of the KIBS firms.

6. Conclusions

The purpose of this paper was to analyse the role of spatial factors in explaining the level of entrepreneurship, i.e. new firm formation, in different localities in Sweden, controlling for important characteristics of individuals (entrepreneurs as well as non-entrepreneurs) including their commuting behaviour. We use two different spatial levels (290 municipalities and 81 labour market regions) and analyse how the characteristics of the home and the work municipality and the home and work labour market region, respectively influence new firm formation.[10] In particular, we are interested in the influence of local and regional networks on new firm formation. A simple indicator of the network potential of locations is population density and interestingly we find that population density in both home and work municipality has a positive effect on new firm formation. However, controlling for population density we find that the accessibility to self-employed in the work municipality has a positive effect on new firm formation. Self-employed functions as peers and source of examples, inspiration,

[10] Of course, quite some people work in their home municipality and only a limited share of the labour force commute to another labour market region.

experiences, encouragement and knowledge for potential entrepreneurs. Human capital intensity in work municipalities, which signals the potential for local knowledge spillovers has a significant positive effect for commuters between municipalities. At the regional level, we find that the share of firms in knowledge-intensive business firms in the work municipality has a significant positive effect in two out of three cases.

Our results clearly show that after controlling for the characteristics of individuals we get significant positive effect on new firm formation from a number of factors representing spatial conditions and in particular the potential for strong networks at the local and the regional level where the local network potential seems to be stronger than the regional network potential, which is what we should expect. Certainly, there is room to qualify our results but they clearly show that spatial factors can never be neglected when we want to understand variations in the rate of entrepreneurship.

References

Acs, Z.J. & C. Armington (2006), *Entrepreneurship, Geography, and American Economic Growth*, Cambridge University Press, New York, NY

Acs, Z.J. & D.B. Audretsch (2003), *Handbook of Entrepreneurship Research: An Interdisciplinary Survey and Introduction*, Kluwer, London

Acs, Z.J. & A. Varga (2005), Entrepreneurship, Agglomeration and Technological Change, *Small Business Economics 24*, 323-334

Andersson, M. & J.P. Larsson (2013), Neighborhood Peers and Entrepreneurship – Does Having Entrepreneurs as Residential Neighbors Induce Entrepreneurship? (mimeo)

Armington, C. & Z.J. Acs (2002), The Determinants of Regional Variation in New Firm Formation, *Regional Stuides 36*, 33-45

Arenius, P., and Minniti, M. (2005). Perceptual Variables and Nascent Entrepreneurship. *Small Business Economics, 24*(3), 233-247.

Arthur, W.B. (1990), Positive Feedbacks in the Economy, *Scientific American 262*, 92-99

Audretsch, D.B. (2007), Entrepreneurship Capital and Economci Growth, *Oxford Review of Economic Policy 23*, 63-78

Audretsch, D.B., D. Dohse & A. Niebuhr (2010), Cultural Diversity and Entrepreneurship: A Regional Analsyis for Germany, *Annals of Regional Science 45*, 55-85

Audretsch, D.B. & M. Fritsch (1994), The Geography of Firm Births in Germany, *Regional Stuides 28*, 359-365

Audretsch, D.B. & M.C. Keilbach (2004), Entrepreneurship Capital and Economic Performance, *Regional Studies 38*, 949-959

Audretsch, D.B & M.C. Keilbach (2007), The Theory of Knowledge Spillover Entrepreneurship, *Journal of Management Studies 44*, 1242-1254

Audretsch, D.B. & E.E. Lehmann (2005), Does Knowledge Spillover Theory of Entrepreneurship Hold for Regions?, *Research Policy 34*, 1191-1202

Bacalod, M., B.S. Blum & W.C. Strange (2009), Skills in the City, *Journal of Urban Economics 65*, 136-153

Baker, T., E. Gedajlovic & M. Lubatkin (2005), A Framework for Comparing Entreprenurship Processes Across Nations, *Journal of International Business Studies 36*, 492-504

Beugelsdijk, S., and Noorderhaven, N. (2005). Personality Characteristics of Self-Employed; An Empirical Study. *Small Business Economics, 24*(2), 159-167.

Blanchflower, D. G. (2004). Self-employment: more may not be better. *Swedish Economic Policy Review, 11*(2), 15-74.

Boden Jr., R. J. (1996). Gender and self-employment selection: An empirical assessment. *Journal of Socio-Economics, 25*(6), 671-682.

Borjas, G. (1986). The Self-Employment of Immigrants, *Journal of Human Resources 21,* 485-506.

Brunello, G. & M. De Paola (2004), Market Failures and Under-Provision of Training, *CES Info Paper*, Business Innovation Department, 2010. Skills for Growth: The Natioanl Skills Strategy, *BIS Economci Paper No. 4*

Cohen, W.M. & D.A. Levinthal (1990), Absorptive Capacity: A New Perspective on Learning and Innovation, *Administrative Science Quarterly ?*, 128-152

Feldman, M.P. & R. Florida (1994), The Geographic Sources of Innovation: Technological Infrastrucutre and Product Innovation in the United States, *Annals of the Association of American Geographers 84*, 210-229

Fritsch, M. (1992). Regional Differences in New Firm Formation: Evidence from West Germany. *Regional Studies, 26*(3), 233-241.

Fritsch, M. & O. Falck (2002), *New Firm Formation by Industry over Space and Time: A Multi-Level Analysis*, Working Paper No. 11, Freiberg University of Mining and Technology, Freiberg

Fujita, M., P. Krugman & A.J. Venables (1999), *The Spatial Economy: Cities, Regions, and International Trade*, The MIT Press, Cambridge, MA

Gelman, A., Hill, J. (2009). *Data Analysis Using Regression and Multilevel/Hierarchical Models*. New York, NY: Cambridge University Press.

Gennaioli, N., et al., (2013), Human Capital and Regional Development, *The Quarterly Journal of Economics 128*, 105-164

Glaeser, E.L. (1999), Learning in Cities, *Journal of Urban Economics 46*, 254-277

Glaeser, et al., (1992), Growth in Cities, *Journal of Political Economy 100*, 1126-1152

Goldstein, G. & T. Gronberg (1984), Economies of Scope and Economeis of Agglomeration, *Journal of Urban Economcis 16*, 91-104

Gompers, P. & J. Lerner (2001), The Venture Capital Revolution, *Journal of Economic Perspectives 15*, 145-168

Guesnier, B. (1994), Regional Variations in New Frim Formation in France, *Regional Studies 28*, 347-358

Hansen, N. (2001), Knowledge Workers, Communication, and Spatial Diffusion, in Johansson, B., C. Karlsson & R.R. Stough (Eds.), *Theories of Endogenous Regional Growth. Lessons for Regional Policies*, Springer, Berlin, 315-329

Hart, D.M. & Z.J. Acs (2011) High-Tech Immigrant Entrepreneurship in the United States, *Economic Development Quarterly 25*, 116-129

Hayek, F. (1945), The Use of Knowledge in Society, *American Economic Review 35*, 519-530

Holl, A. (2004), Transport Infrastructure, Agglomeration Economies, and Firm Birth: Empirical Evidence from Portugal, *Journal of Regional Science 44*, 693-712

Jacobs, J. (1969), *The Economy of Cities*, Random House, New York

Jayawarna, D., Rouse, J., and Kitching, J. (2013). Entrepreneur Motivations and Life Course. *International Small Business Journal, 31*(1), 34-56.

Johansson, B., Klaesson, J., and Olsson, M. (2002). Time distances and labor market integration. *Papers in Regional Science, 81*(3), 305-327.

Johansson, B., Klaesson, J., and Olsson, M. (2003). Commuters' non-linear response to time distances. *Journal of Geographical Systems, 5*(3), 315-329.

Johansson, B. & C. Karlsson (2001), Geographical Transaction Costs and Specialization Opportunities of Small and Medium-Sized Regions: Scale Economies and Market Extension, in Johansson, B., C. Karlsson & R.R. Stough (Eds.), *Theories of Endogenous Regional Growth. Lessons for Regional Policies*, Springer, Berlin, 150-180

Karlsson, C. (2011), Clusters, Networks and Creativity, in Andersson, D.E., Å.E. Andersson & C. Mellander (Eds.), *Handbook of Creative Cities*, Edward Elgar, Cheltenham, 85-114

Karlsson, C. (2012), Entrepreneurship, Social Capital and Regional Economic Development: An Introduction, in Karlsson, C., B. Johansson & R.R. Stough (Eds.), *Entrepreneruship, Social Capital and Governance. Directions for the Sustainable Development and Competitiveness of Regions*, Edward Elgar, Cheltenham, 1-26

Karlsson, C., B. Johansson & R.R. Stough (2012), Introduction – Human Capital and Agglomeration, in Karlsson, C., B. Johansson & R.R. Stough (Eds.), *The Regional Economics of Knowledge and Talent. Local Advantage in a Global Context*, Edward Elgar, Cheltenham, 1-24

Karlsson, C. & U. Gråsjö (2013), Entrepreneurial Knowledge, Technology and the Transformation of Regions. An Introduction, in Karlsson, C., B. Johansson & R.R.

Stough (Eds.), *Entrepreneurial Knowledge, Technology and the Transformation of Regions*, Routledge, London, 1-18
Keirstad, B.S. (1957), The Structure and Accumulation of Capital, *The Canadian Journal of Economics and Political Science 23*, 555-559
Kirchhoff, B.A. (1994), *Entrepreneurship and Dynamic Capitalism: The Economics of Business Firm Formation and Growth*, Greenwood Publishing, Westport, CT
Kirzner, I.M. (1973), *Competition and Entrepreneurship*, Chicago University Press, Chicago
Kirzner, I.M. (1979), *Perception, Opportunity, and Profit: Studies in the Theory of Entrepreneurship*, University of Chicago Press, Chicago
Knight, F. (1921), *Risk, Uncertainty and Profit*, University of Chicago Press, Chicago
Krugman, P. (1998), What's New About the New Economic Geography?, *Oxford Review of Economic Policy 14*, 7-17
Langlois, R.N. (1992), Transaction-Costs Economics in Real Time, *Industrial and Corporate Change 1*, 99-127
Le, A. T. (1999). Empirical Studies of Self-Employment. *Journal of Economic Surveys, 13*(4), 381-416.
Lee, S.Y., R. Florida & Z.J. Acs (2004), Creativity and Entrepreneurship: A Regional Analysis of New Firm Formation, *Regional Studies 38*, 879-891
Love, J.H. & S. Roper (2001), Outsourcing in the Innovation Process: Location and Strategic Determinants, *Papers in Regional Science 80*, 317-336
Markusen, A. (1996), Sticky Places in Slippery Space: A Typology of Industrial Districts, *Economic Geography 72*, 293-313
Marshall, A. (1920), *Principles of Economics*
Mason, C. (1991). Spatial variations in enterprise: the geography of new firm formation. In R. Burrows (Ed.), *Deciphering the enterprise culture* (pp. 74-106). New York: Routledge.
Mueller, P. (2006). Entrepreneurship in the Region: Breeding Ground for Nascent Entrepreneurs? *Small Business Economics, 27*(1), 41-58.
Nijkamp, P. (2003), Entrepreneurship in a Modern Network Economy, *Regional Stuides 37*, 395-405
Nyström, K. (2006). *Entry and Exit in Swedish Industrial Sectors.* Jönköping International Business School, Jönköping. (JIBS Dissertation Series, No. 032)
Parker, S.C. (2009), *The Economics of Entrepreneurship*, Cambridge University Press, Cambridge
Porter, M.E. (2000), Location, Competition, and Economic Development: Local Clusters in a Global Economy, *Economic Development Quarterly 14*, 15-34
Putnam, R.D., R. Leonardi & R.Y. Nanetti (1993), *Making Democracy Work: Civic Traditions in Modern Italy*, Princeton University Press, Princeton
Reynolds, P.D., B. Miller & W.R. Maki (1995), Explaining Regional Variation in Business Births and Deaths: U.S. 1976-1988, *Small Business Economics 7*, 389-407
Reynolds, P. D., Bygrave, B., and Hay, M. (2003). Global Entrepreneurship Monitor Report. Kansas city MO: E.M. Kaufmann Foundation.
Rosenthal, S.S. & W.C. Strange (2008), The Attenuation of Human Capital Spillovers, *Journal of Urban Economics 64*, 373-389
Saxenian, A. (2002), Silicon Valley's New Immigrant High-Growth Entrepreneurs, *Economic Development Quarterly 16*, 20-31
Scheinkman, J.A. (2008), Social Interactions, *The New Palgrave Dictionary of Economics*, ?-?
Shane, S. (2000), Prioor Knowledge and the Discovery of Entreprenurial Opportunities, *Organization Science 11*, 448-469

Shane, S. & S. Venkataraman (2000), The Promise of Entrepreneurship as a Field of Research, *Academy of Management Review 25*, 217-226

Sternberg, R. (2011), Regional Determinants of Entrepreneurial Activities – Thories and Empirical Evidence in Fritsch, M. (Ed.), *Handbook of Research on Entrepreneurship and Regional Development. National and Regional Perspectives*, Edward Elgar, Cheltenham, 33-57

Sutaria, V. & D.A. Hicks (2004), New Firm Formation: Dynamics and Determinants, *Annals of Regional Science 38*, 241-262

Teece, D. (1986), Profiting from Technological Innovation: Implications for Integration, Collaboration, Licensing and Public Policy, *Research Policy 15*, 285-305

Teixeira, A. (2008), Entrepreneurial Potential in Chemistry and Pharmacy: Results from a Large Survey, *Journal of Business Chemistry 5*, 48-63

Uzzi, B. (1999), Embeddedness in the Making of Financial Capital: How Social Relationships and Networks Benefit Firms Seeking Financing, *American Sociological Review 64*, 481-505

Wagner, J., and Sternberg, R. (2004). Start-up activities, individual characteristics, and the regional milieu: Lessons for entrepreneurship support policies from German micro data. *The Annals of Regional Science, 38*(2), 219-240.

Wong, P., Y. Ho & E. Autio (2005), Entrepreneruship, Innovation and Economic Growth: Evidence from GEM Data, *Small Business Economcs 24*, 335-350