

Determinants of Entry and Exit: The Significance of Demand and Supply Conditions at the Regional Level

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1 Introduction

Today there is an extensive research literature on entrepreneurship and firm demography. However, even if many studies have identified substantial and persistent variations in entrepreneurship rates across regions in a variety of countries (Georgellis and Wall 2000), most attempts trying to explain entrepreneurship variations have been restricted to industry determinants (Arauzo-Carod and Manjón-Antolín 2007). As a matter of fact, location factors are neglected in most studies trying to explain variations in entrepreneurship.¹ This is astonishing, since there are studies, which show that location factors matter.² There are numerous examples of location factors that might explain spatial variations in entrepreneurship in the literature on regional economics and economic geography including institutional framework, size of region, industrial and firm structure, in-migration, demand growth, employment specialization, unemployment rates, educational level, university R&D, the availability of financing, and population density. However, our understanding of the empirical structure of the regional variations in entrepreneurship as well as the underlying theoretical explanations is still incomplete. Thus, “the economics literature on regional dimensions of entrepreneurship looks ripe for further investigation and extension” (Parker 2004).³ In a similar manner, Audretsch and Feldman (2004)

¹“Entrepreneurial management, or the study of the creation and growth of new companies, has become a prominent field in the literature on management. This field has developed largely independently of location considerations”. Porter (2000, 269).

²See, e.g., Reynolds et al. (1993), Audretsch and Fritsch (1994), Garofoli (1994), Guesnier (1994), Malecki (1993), Saxenian (1999), Fotopoulos and Spence (1999, 2001), Berglund and Brännäs (2001), Armington and Acs (2002), Arauzo and Teruel (2005), and Karlsson and Backman (2008).

³“It is surprising to observe that the geography of entrepreneurship has indeed received far less attention [than other aspects of entrepreneurship]”. Nijkamp (2003).

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remark that the life cycle of spatial units, such as agglomerations, clusters and regions, with regard to the role of entrepreneurship is a relatively uncharted area.

A better understanding of the drivers of entrepreneurship is important, since many authors assume a relationship between entrepreneurship and growth at both the national and the regional level (Plummer and Acs 2004; Fritsch and Mueller 2004; van Stel and Storey 2004; Audretsch et al. 2006).⁴ It is imagined that the continual entry and exit of firms and plants is a necessary condition for regional growth. The entry of new firms and plants tend to be connected with productive innovation, i.e. the introduction of new or improved products and/or production methods (Baumol 2002). The entry of new actors in the market place increases competition and forces incumbents to become more effective, i.e. to increase their productivity, move to another region or to go out of business. Thus, when new innovative firms enter, some existing businesses are displaced in a process of creative destruction (Schumpeter 1934; Robinson et al. 2006). However, far from all, entry of new firms generates entrepreneur-driven Schumpeter-type creative destruction (Manjón-Antolín 2004). Instead, new firm formation is a heterogeneous phenomenon where innovative entrepreneurs are mixed with more normal entrepreneurs in the form of passive followers, over-optimist gamblers and people trying to find an alternative to unemployment (Vivarelli 2007). Cabral (2004) even claims that most entrepreneurial ventures are “entry mistakes”. However, there seems to be a considerable consensus that entrepreneurship plays a critical role for the introduction of radical innovations.

However, disregarding the large diversity of entrepreneurial ventures, entrepreneurship has been identified by many authors as an important driver for economic growth, competitiveness and job creation (Thurik and Wennekers 2004; Friis et al. 2006), even if there are authors, such as Acs and Storey (2004), who claim that the evidence remains inconclusive. However, Karlsson and Nyström (2007) present a survey of empirical studies since 1996 of the relationship between entrepreneurship and productivity, employment and economic growth that shows that two thirds of the studies find a significant positive relationship.

The focus in this paper is how the conditions for entrepreneurship vary between regions. Our starting point is the functional region approximated by the commuting region. Our prime motivation for this is that the functional region for almost all businesses makes up their home market but also offers most of the supply conditions in terms of labour, business services, infrastructure, that are critical for both the start-up of firms and for the efficient operation of firms. Since both the market and the supply conditions vary with the size of functional regions, we have strong reasons to believe significant variations in the entry and exit of firms between regions of different size but also differences in terms of the sectoral composition, the size distribution, of entering and exiting firms. A better understanding of how and why the entry and exit of firms vary between different functional regions is important as a knowledge base to develop regional policies that support the entry and exit of firms in regions of various

⁴Already Chinitz (1961) argued that the existence of many small firms and a culture of entrepreneurship could explain why New York was much more successful than Pittsburgh.

sizes. Since the background conditions vary with the size of functional regions so must the regional policies that directly and indirectly are targeted at supporting the entry and exit of firms to stimulate regional economic growth.

The theoretical and empirical literature gives a strong support to the idea that the agglomeration of population and jobs in large urban regions offers favourable incubator conditions for creative entrepreneurship and innovation (Hoover and Vernon 1959; Thompson 1968; Leone and Struyck 1976; Pred 1977; Davelaar 1991) and has a positive effect on the location of firms and entrepreneurship (Hansen 1987; Guimarães et al. 2000; Figueiredo et al. 2002). The clustering of economic activities in a geographical space (Audretsch and Feldman 2004; Porter 1998) suggests that there are positive agglomeration economies influencing the location of new firms and that these economies may compensate for the negative effects in terms of higher rent, and wage costs in agglomerations and of potential competition from incumbent firms located in the agglomeration. However, earlier studies use administrative regions rather than functional regions as their spatial units. We claim that a better understanding of the role of size of regions can be achieved if the empirical analysis is based on functional regions. We also claim that incomes are a better measure of size than either population or jobs, since they represent a measure of the potential market demand in different regions. Furthermore, this potential market demand can for each locality within a functional region be divided into three components: the intra-locality, the intra-regional, and the inter-regional demand potential, respectively. This offers an opportunity to highlight the relative importance of these three demand (=size) measures in general for entrepreneurship as well as for entrepreneurship in different sectors.

The purpose of the current paper is to analyse the theoretical arguments as to why large regions generally should generate more entrepreneurship and empirically analyze the role of regional size in explaining variations in total entrepreneurship and entrepreneurship in different sectors across functional regions using data from Sweden.

The paper is organized as follows: In Sect. 2 we present our theoretical framework and our hypotheses. Our empirical approach and our data are presented in Sect. 3. The empirical analyses are performed in Sects. 4 and 5 provides the conclusions.

2 Regional Size as a Stimuli for Formation of New Firms: The Theoretical Arguments

The variations in entrepreneurship between large and small functional regions are related to variations in on the one hand, demand conditions and, on the other hand, supply conditions. Regional variations in demand conditions, in terms of regional market potential and regional demand for new products, generate spatial variations in entrepreneurial opportunities. On the supply side, there are similar differences between regions of different sizes in the number of economic agents with a capacity to discover, create and exploit entrepreneurial opportunities due to differences in

educational achievements, work experiences, networks and so on. On the supply side there are also variations between regions of various sizes as regards conditions such as the knowledge base, information supply, industrial structure, company structure, supply of inputs and producer services, supply of financial services and capital, infrastructure supply. At an aggregated level the differences in demand and supply conditions between regions of different size create differences in the agglomeration economies offered by different regions.

The interest in the effects of agglomeration economies goes back at least to Marshall (1920), who identified three types of external economies: a common labour market, information spillovers, and the development of specialised input suppliers. However, it was Ohlin (1933), who by his classification of agglomeration economies illustrated how individual firms and thus potential entrepreneurs are affected by being localised to regions of varying size⁵:

- Internal economies of scale associated with the production function of the firm. Since many products are distance-sensitive or have high geographical transaction costs, the size of the regional market is critical for many firms to be able to reach a break-even and make a profit.
- Location economies, which are external to the individual firm but are derived from the size of its industry in the region where it is located.
- Urbanisation economies, which are external to both the firm and its industry, and which are dependent upon the size of the total regional economy.
- Inter-industry linkages of input-output type where proximity to input suppliers reduces the price of inputs due to scale advantages and reduced transport costs.

These factors explain why entrepreneurs may choose to locate in large urban regions, and accept increased land and labour prices, in situations where simple location analysis would suggest a decentralised location. However, the localisation and urbanisation economies are in principle static concepts. If we ask about the spillovers entrepreneurs look for we need to turn to the dynamic version of the localisation economies, i.e. the Marshall-Arrow-Romer's (MAR) and Porter's theories of specialisation, and the dynamic version of urbanisation economies, i.e. Jacobs' theory of diversity (Glaeser et al. 1992). The MAR's and Porter's theories stress that the industrial specialisation of urban regions is the most important source of spillovers, an attractor for entrepreneurs in the same industry. Jacobs, on the other hand, claims that the most important spillovers come from outside the industry with industrial diversity being an attractor for entrepreneurs. Henderson et al. (1995) show that the importance of the two types of spillovers varies between industries. Regarding manufacturing industry, they find that diversity doesn't really matter. However, the diversity of an urban region attracts new industries and more particularly high technology industries. In the sequel, we discuss in more detail how agglomeration economies in general and urbanisation economies in particular influence entrepreneurial behaviour.

⁵A similar classification of agglomeration economies has been provided by Hoover (1948).

2.1 Entrepreneurship and Regional Variations in Demand Conditions

The best opportunities for entrepreneurial initiatives are offered by functional regions, which combine a large home market with a high accessibility to markets in other regions, i.e. large functional regions. Generally speaking, the larger the functional region, the higher the per capita income. Entrepreneurs that make start-ups in large functional regions may take advantage of close proximity to a concentration of (potential) customers, i.e. of purchasing power, which of course can be other firms.

Under certain conditions, entrepreneurs may grab incumbents' market share if they locate near them (Hotelling 1929). Admittedly, this gain may be short-lived if more entrepreneurs enter, or if incumbents react to this unwanted competition. When the competition in the product market is imperfect, geographical proximity increases competition in the product market (Fujita et al. 1999), which implies that entrepreneurs may suffer from proximity to firms offering similar products, in particular if the demand is thin. However, when there is a demand for variety among customers, large regions always offer entrepreneurs a greater possibility to successfully launch a new product.

A third motive for entrepreneurs to locate start-up firms in large functional regions may be more long-term. Entrepreneurs may choose to locate in a large functional region because they are more likely to be better exposed to customers. The underlying reason is that searching is costly for customers who, *ceteris paribus*, prefer to minimize search cost by purchasing in areas of concentrated (and varied) supply. This is particularly relevant in product markets with discerning potential customers with specific demands and requirements, who wish to search and inspect before purchasing. Such product markets are to a high extent concentrated in large functional regions. It is these regions, which host the most demanding customers in the form of company headquarters, R&D and product development units of large companies as well as other advanced establishments, such as research universities, university hospitals, R&D institutes, and specialised R&D firms.

A fourth advantage for entrepreneurs of locating in large functional regions is the positive information externality in such regions, through which individual (potential) entrepreneurs receive signals about the strength of the regional demand by observing the successful trades of incumbent firms. Such observations also provide information about varieties of existing products, which also might trigger the development of new varieties that might be complements or substitutes to existing product varieties. One further advantage for an entrepreneur of a location in a large functional region might be the signalling effect to potential customers in the form of an indication or image of quality.

A sixth advantage for entrepreneurs to locate in large functional regions is risk reduction (Mills and Hamilton 1984). To the extent that fluctuations in demand are imperfectly correlated across customers, demand can be stabilized since some customers are buying while others are not. Finally, when an entrepreneur chooses

a location in a large functional region, he can expect a local economic milieu of qualified and demanding customers, which is important for entrepreneurs engaged in innovation processes and product development.

2.2 Entrepreneurship and Regional Variations in Supply Conditions

On the supply side, the regional economic milieu (including its culture, knowledge-base, and attitudes to businesses) often appears to act as a critical success factor for new forms of entrepreneurship (Camagni 1991). Large functional regions offer advantages to entrepreneurs in terms of knowledge flows that are particularly important when the product and/or process knowledge is complex and perhaps tacit in nature (Jaffe et al. 1993; Karlsson and Manduchi 2001). Tacit knowledge, which is vital to found new firms, is best communicated informally through frequent face-to-face interactions, hence the importance of the proximity offered by large functional regions. Major research universities and research laboratories are normally located to large functional regions. This implies that these regions offer a larger and more varied knowledge base for potential entrepreneurs to draw upon (Audretsch et al. 2006).

A special type of information externality accrues to potential entrepreneurs from observing a large number of successful incumbents in large functional regions, i.e. there is large potential for product and production knowledge to spill-over in large regions.⁶ This implies that the start-up rate for each industrial sector should increase with the existing density of firms in each sector. Large and dense regions offer physical proximity, which facilitates the integration of multi-disciplinary knowledge that are tacit and therefore person-embodied rather than information-embodied as well as allowing the rapid decision making needed to cope with uncertainty (cf., Patel and Pavitt 1991). Due to urbanisation economies, these regions also offer diversity, that is, economies of scope, in information, skills, knowledge, competence, producer services, and other inputs, which are crucial for innovative entrepreneurial processes. Furthermore, they offer advantages in terms of access to a large pool of well-educated and specialized labour (Marshall 1920), particularly specialized workers in accounting, law, advertising and different technological fields.⁷ This is partly a result of the fact that most leading higher education institutions are located in large functional regions. This reduces the costs of starting-up and expanding new businesses (Krugman 1993). It probably also leads to a higher

⁶We thus have a spatial version of the so-called “knowledge spillover theory of entrepreneurship” (Audretsch and Lehman 2005).

⁷Florida (2002) has suggested that creative capital rather than human capital is the source of entrepreneurship and economic growth in regions.

proportion of high-quality start-ups but may also be an important success factor for new firms following the start of operations.

Large, densely populated functional regions are also conducive to a greater provision of non-traded inputs, i.e. their service infrastructure is more developed. These regions provide these inputs both in greater variety, with a higher degree of specialization at lower costs (Krugman 1991a, b). This implies that entrepreneurs that start firms in large regions can take full advantage of all potential substitution possibilities inherent in available production functions, i.e. taking full advantage from outsourcing of functions and activities. One special aspect of the greater provision of non-traded inputs is the larger and more varied supply of financial services in large regions. Risk capital investors prefer to locate in large urban regions since they try to lower their risks by investing in several new projects and by keeping hands on relationship with the entrepreneurs and their new companies, which demands geographical proximity and frequent face-to-face interactions (Thornton and Flynn 2003). A larger and more varied supply of financial services in large regions tends to stimulate the start-up of new firms in such regions (Backman 2008). The reason is that face-to-face contacts normally are required to obtain funding for starting new firms, since there are normally no physical assets that can serve as collateral.

There also exist physical infrastructure benefits for entrepreneurs to locate in large functional regions in terms of, for example, access to major highways, international airports and broadband capacity. A final reason for large functional regions providing advantages for entrepreneurs arises from the reductions in spatial transaction costs that is made possible by locating in a large and dense region (Quigley 1998).⁸ In particular, search costs for customers, suppliers, services, and knowledge are lower in large and dense functional regions.

The information flow economies (Acs et al. 1992) on both the supply and the demand side are greater in large functional regions than small ones. Information and knowledge is a *sine qua non* for entrepreneurial success. Learning-by-doing supported by inter-firm network collaboration enhances, for example, the competitive potential of new firm initiatives (Malecki and Poehling 1999). Since large urban regions are the leading communication and transport network nodes, they are the primary locations of emission and reception of information and knowledge. Because these regions contain concentrations of complex communication equipment and transport terminals, much information and knowledge diffuse more easily from urban region to urban region, than to the hinterland around each urban region (Florax and Folmer 1992; Guillain and Huriot 2001). Thus, new firms are likely to be started where such economies are greatest. Large functional regions, in particular, offer favourable conditions for innovative entrepreneurship as a result of a larger and more varied access to knowledge and to skilled and educated labour,

⁸It may be observed that while in some respects spatial transaction costs have fallen over time, there are other aspects in which spatial transaction costs appear to have actually increased over time (McCann and Sheppard 2003).

economics of density and entrepreneurial opportunities generated by the large functional regions being a nucleus of innumerable networks with a scale ranging from local to global (Nijkamp 2003). Regional economic milieus which offer a rich supply of various types of networks (i.e. mainly large functional regions) tend to encourage entrepreneurship, since participation or involvement in regional or broader economic networks makes it possible to externalize some of the risks involved (Shapiro 1984).⁹ This implies that conditions that can generate potentially synergetic situations and support for learning are mostly available in large functional regions.

Besides general demand and supply conditions, one may assume that the larger and richer a functional region, the larger the number of potential entrepreneurs, since individuals in such regions in general are better educated, have a more varied work experiences, and so on. We may even assume that large (and dense) functional regions offer increasing returns in the acquisition of entrepreneurial skills and entrepreneurial competence due to more numerous, more varied and more effective interactions between individuals in such regions (Glaeser 1999; Desmet 2000). Since larger functional regions offer larger opportunities and higher capacity for entrepreneurship, they bound to experience a build-up of entrepreneurial knowledge, which will stimulate further entrepreneurial action.

Furthermore, entrepreneurs are change agents who will not only make decisions to start firms but they will also actively try to shape the regional economic milieu and regional institutions by trying to influence political decision makers in the region or try to take their own initiatives (Stimson et al. 2006). They will spend resources and develop relationships that further their own interests as well as the interests of potential entrepreneurs, through the creation of a positive regional entrepreneurial environment (Feldman 2001). Good conditions for entrepreneurial actions and good conditions in general in large functional regions will stimulate potential entrepreneurs, often well-educated people, in smaller regions to move to larger regions.¹⁰ When more potential entrepreneurs gather in larger functional regions, the conditions for entrepreneurial actions will improve due to an increased availability of entrepreneurial knowledge. This will further induce entrepreneurial initiatives and encourage in-migration of potential entrepreneurs from other (smaller) regions. In this sense, entrepreneurial spatial behaviour generates a dynamic cumulative concentration process of entrepreneurial knowledge, skills and competence.

⁹This does not exclude the possibility that some smaller functional regions may offer favourable seed-bed conditions for entrepreneurship within, for example, specialized industrial clusters.

¹⁰The concept potential entrepreneurs is used here to stress that when well-educated people move into larger regions from smaller ones the major attractor is probably the dynamic labour market in larger functional regions. However, as soon as the in-migrants are established in the larger region, they become potential entrepreneurs that sometimes are better at discovering business opportunities than people who have lived in the larger region for a long time. It seems, on the other hand, to be well-established in the literature that entrepreneurs rarely move when they establish new (Stam 2007) and, in particular new high-tech firms (Cooper and Folta 2000). However, they may have migrated to the region well before they become entrepreneurs.

It is clear that new enterprises in a functional region contribute significantly to its economy and employment but, in particular, to its renewal. It is important in this connection to understand that all entrepreneurial start-ups can be seen as experiments. All potential and active entrepreneurs benefit from learning the outcome of such experiments and the knowledge spillovers from such experiments are proportional to the number of experiments. Since larger functional regions normally host many more such experiments than smaller ones, they also benefit proportionally more from such entrepreneurial learning. Thus, they accumulate a larger stock of entrepreneurial knowledge over time, which implies that externalities from entrepreneurial knowledge are dynamic in nature. In a multi-regional context, each functional region may build up a stock of regional entrepreneurial knowledge based upon past and current entrepreneurial activity (Glaeser et al. 1992), involving sets of cumulative experiments. Such regional accumulation of entrepreneurial knowledge affects the probability that entrepreneurial actions will take place and be successful and since large functional regions accumulate more entrepreneurial knowledge, they will also generate more entrepreneurial activities.

Even if there are many reasons why larger regions should be expected to offer better supply side opportunities for entrepreneurship, it is not clear in the available literature whether more diversified or more specialised regional economic milieus offer the best conditions for entrepreneurship and firm growth (Glaeser et al. 1992; Henderson et al. 1995). It has in this connection been suggested that firms and thus entrepreneurs prefer different regional economic milieus depending upon the stage of the life cycle of their products (Duranton and Puga 2001). However, the distinction between diversified and specialised regions is no easy issue, since large diversified regions also exhibit many different specialisations.

2.3 Entrepreneurship and Agglomeration: The Empirical Picture

The general relationship between agglomeration economies and location has been analysed extensively from both a theoretical and an empirical point of view.¹¹ However, the more specific relationship between agglomeration economies and entrepreneurship has been less extensively analysed.

In van Ort and Stam (2006) the relationship between agglomeration economies and entrepreneurship is analysed. The authors find evidence that agglomeration effects have a stronger effect on new firm formation than on growth of incumbent in the ICT industry. According to van Ort and Stam (2006), there are two reasons that can explain this relationship. The first reason, incumbent firms usually have a wider spatial orientation, and the second reason is that the incumbent firms usually tend to

¹¹See, e.g., McCann (1995), Guimarães et al. (2000), Fujita and Thisse (2002), Rosenthal and Strange (2003), McCann and Sheppard (2003), Holl (2004), and Viladecans (2004).

keep their knowledge inside the company as much as possible in comparison to new firms. According to Acs (2000), the geography of innovation and the new economic geography suggest that the extent to which a country is entrepreneurial and its economic system is agglomerated can be a factor that explains technological change. He concludes that, entrepreneurial activity and agglomeration have a positive effect on technological change in the EU. McCann (1995) analyses the characterization of various types of agglomeration economies, i.e. internal returns to scale, localization economies and urbanization economies. Intermediate locations are indeed the norm regarding agglomeration economies. Agglomeration factors are available in a larger metropolitan area, like sheer size of medium-sized agglomerations and access to high-level knowledge in local universities. Agglomeration economies, foot looseness, are probably to increase in the future, based on growing globalization. This would mean that medium-sized agglomerations at some distance from the large cities are facing additional opportunities for economic growth.

2.4 Hypotheses

Based upon the above discussion we now launch our first hypothesis:

H1: The higher the regional income level the larger the gross rate of firm formation *However, it must be stressed that start-ups and newly established firms face substantial risks for numerous reasons. As a consequence, the death rate among start-ups is relatively high but tends to decrease rather rapidly over time.¹² A high death rate among newly formed firms is natural since they are involved in the introduction of new products and/or new production processes in the market place. Accordingly, they provide a major challenge to established firms and encourage or force them to improve product quality and services, or to reduce prices or to leave the market. This means that entrepreneurs play a fundamental role in the renewal of regional economies by strengthening competition and initiating competitive processes at the ultimate end in a creative destruction of existing modes of production. Thus, we shall expect regions with extensive entrepreneurial activities to also be characterized by extensive firm exits, i.e. we expect entry and exit rates across regions of various sizes to be correlated (Cf., Keeble and Walker 1994; Reynolds et al. 1994). Earlier studies show that high population density leads to relatively low survival rates of new businesses, but to higher average employment in those start-ups that manage to survive (Fritsch et al. 2006; Weyh 2006). This implies that higher intensity of competition in larger agglomerations results in a more rigorous market selection in these regions with the surviving businesses performing relatively well there.*

¹²Naturally, the survival or success rates of new entrepreneurs show large variations between sectors and regions (Acs 2000).

This discussion allows us to formulate our second hypothesis:

H2: The larger the regional income the larger the rate of firm deaths *The idea here is that entries, among other things, can be expected to generate a displacement effect that causes exits to increase. However, exits might free niches in the market place and economic resources that might increase the ability and willingness of potential entrepreneurs to enter the market (Acs and Audretsch 1990; Nyström 2006; Arauzo et al. 2007). If we consider hypotheses H1 and H2 together, we run into uncertainty concerning the effects of regional size on the net entry of firms. However, based upon our basic arguments about the importance of regional size for new firm formation we launch the following hypothesis concerning the net entry of firms.*

H3: The larger the regional income the larger the net entry of firms *In the introduction to this paper, we made the remark that it is possible to work with a more sophisticated representation of the regional income and its influence on entrepreneurship. Our starting point is that the geographical space of any nation can be divided into a number of functional regions, where each functional region contains a number of localities. For practical reasons these functional regions can be approximated by labour market, i.e., commuting, regions. Entrepreneurs start their firms in a locality and, depending upon their type of product, they market their product within the locality, within the region and/or within the whole national economy.¹³ Thus, the different markets are not of equal importance for all products. In this paper, excluding the primary sector and the public sector, we make a distinction between four types of products or industries: primary products, manufacturing products, ordinary services and advanced business services, where ordinary services have a high content of household services. For these four product groups, we now launch the hypotheses H4–H6.*

H4: We expect entrepreneurship in advanced business services to have the highest dependency on the size of the intra-regional market potential *The motivation for this hypothesis is the general tendency among advanced business services to locate in large functional (urban) regions, where their major customers are located and where they can interact face-to-face with their customers.*

H5: We expect entrepreneurship in manufacturing to have the highest dependency on the size of the inter-regional market potential *Producers of manufacturing products on average have a lower need for face-to-face contacts with their customers than producers of advanced business services. Manufacturing production is also more space demanding. This induces entrepreneurs in manufacturing to start their enterprises in regions with plenty of space but with a good location in the logistical networks to be able to deliver efficiently to the customers in the most important markets.*

¹³The international market is of course also an alternative but an alternative that we disregard here.

H6: We expect entrepreneurship in ordinary services to have the highest dependency on the size of the intra-locality market potential *Most enterprises in the household service sector operate with a very small market area. Thus, entrepreneurs starting firms delivering household services will prefer to locate in localities with a high market potential.*

3 Empirical Approach and Data

This paper uses FEVD regressions, i.e. fixed effects vector decomposition regressions, to investigate the market potential and new firm formation in industrial sectors at the local level.¹⁴

The regional concept in focus in this study is the functional region, which for practical purposes is approximated with the commuting region. A functional region normally consists of a central municipality surrounded by a number of hinterland municipalities.

To model size we measure for each municipality its total accessibility to Gross Regional Product (GRP), which we interpret as accessibility to market potential and thus to potential demand. For each municipality we break down the total accessibility to GRP into two components:

- Local accessibility to GRP
- External accessibility to GRP

This makes it possible for us to make statements about which accessibility that matters most for gross entries, exits and net entries of firms in different sectors in the economy. In this study we make a distinction between four sectors: (a) the primary sector, (b) the manufacturing sector, (c) the ordinary service sector and (d) the advanced service sector. Gross entry of firms in a municipality is defined as $(\text{number of entering firms} + 1) / (\text{population in working age in 1,000s})$. Exit of firms in a municipality is defined as $(\text{number of exiting firms} + 1) / (\text{existing firms})$. Net entry of firms in a municipality is defined as $(\text{number of entering firms} - \text{number of exiting firms}) / (\text{existing firms} + 1)$.¹⁵

To control for the influence on gross entries, exits and net entries from other factors, we also include a number of control variables in our analysis. These control variables are (a) the employment rate, (b) the share of the labour force with more than 3 years of university schooling, (c) the share of small firms with one to four employees in all sectors, (d) local accessibility to GRP, (e) external accessibility to GRP.

¹⁴See Plümper and Troeger (2007) for further details.

¹⁵We add one to all observations to avoid any zeros in entries and exits in any municipality. This “transformation” will only have a very slight influence on our econometric results.

The data used in this paper comes from Statistics Sweden and spans over the years between 1993 and 2004.¹⁶ Tables 1 and 2 below give a short presentation of the data.

Table 1 Variable descriptions

Variable	Description/explanation
Population in working age	Population in the ages between 20 and 64 years of age
Entry	$(\text{Number of entering firms} + 1) / (\text{population in working age in 1,000s})$
Exit	$(\text{Number of exiting firms} + 1) / (\text{existing firms} + 1)$
Net entry	$(\text{Number of entering firms} - \text{number of exiting firms}) / (\text{existing firms} + 1)$
Local accessibility to GRP	Accessibility to Gross Regional Product in municipality m coming from economic activity in municipality m
External accessibility to GRP	Accessibility to Gross Regional Product in municipality m coming from economic activity in all other Swedish municipalities
Education	Population with more than 3 years of university schooling/population in working age
Employment rate	Population holding a job/population in working age
Share of small firms	Number of firms with 1–4 employees/all firms

Table 2 Descriptive statistics

Variable	Mean	Median	Std. dev.	Min	Max
Entry in primary sector	0.346	0.256	0.310	0.012	3.256
Entry in the manufacturing sector	0.980	0.885	0.489	0.092	4.889
Entry in the ordinary service sector	1.857	1.741	0.780	0.202	8.160
Entry in the advanced service sector	1.533	1.395	0.808	0.170	8.537
Exit in the primary sector	0.228	0.179	0.199	0.014	3.000
Exit in the manufacturing sector	0.108	0.098	0.051	0.012	0.571
Exit in the ordinary service sector	0.137	0.132	0.045	0.017	0.533
Exit in the advanced service sector	0.193	0.175	0.086	0.016	1.000
Net entry in the primary sector	-0.006	0.000	0.365	-0.857	0.889
Net entry in manufacturing sector	-0.059	-0.060	0.255	-0.900	0.875
Net entry in the ordinary service sector	-0.051	-0.046	0.189	-0.857	0.857
Net entry in advanced service sector	0.037	0.037	0.237	-0.889	0.900
Local accessibility to GRP	0.006	0.003	0.017	0.001	0.289
External accessibility to GRP	0.026	0.011	0.044	0.001	0.319
Education	0.098	0.087	0.043	0.040	0.366
Employment rate	0.749	0.750	0.044	0.514	0.882
Share of small firms	0.606	0.602	0.056	0.417	0.809

Note: N = 3,420

¹⁶See tables of correlation matrix in the appendix for further details/characteristics of the variables.

4 Empirical Results

Here we present our empirical results. We start by analyzing the determinants of firm entry in our four different sectors during the time period 1993–2004.¹⁷ Then we analyze the determinants of firm exit in our four different sectors and thereafter we investigate the determinants of net entry of firms in the different sectors.

4.1 Firm Entry

The dependent variable is defined as entry of firms in each one of our four sectors, for the time period 1993–2004 (Table 3).

Local accessibility to GRP has a strong significant impact on entry of new firms. For the primary sector and the manufacturing sector this impact is negative and for the ordinary service sector and the advanced service sector it is positive. External accessibility to GRP also has a strong significant impact on entry of new firms. However, the negative impact is only valid for the primary sector and positive for the three other sectors. Further, the strong significant impact on new firm formation can be interpreted as follows. In municipalities with a high external accessibility to GRP, potential entrepreneurs tend to form new firms. A high employment rate

Table 3 Results from the FEVD regressions for firm entry

Dependent variable	FEVD (fixed effects vector decomposition)			
	Entry (1) (primary sector)	Entry (2) (manufacturing sector)	Entry (3) (ordinary service sector)	Entry (4) (advanced service sector)
Local accessibility to GRP	−2.547 (11.08)***	−0.979 (2.35)**	9.274 (16.18)***	12.991 (24.38)***
External accessibility to GRP	−1.590 (15.50)***	0.577 (3.08)***	3.292 (12.89)***	5.556 (23.33)***
Education	−0.666 (5.92)***	−3.266 (16.03)***	−6.380 (22.26)***	1.643 (5.86)***
Employment rate	−1.073 (12.17)***	−3.192 (19.19)***	−3.778 (17.30)***	−2.385 (11.94)***
Share of small firms	0.997 (15.31)***	1.687 (14.22)***	2.227 (13.82)***	2.484 (16.79)***
Constant	0.669 (8.54)***	2.660 (18.11)***	3.817 (19.56)***	1.421 (7.97)***
Observations	3,420	3,420	3,420	3,420
R-squared	0.61	0.48	0.62	0.70

Significant at 5%, *significant at 1%

¹⁷The four sectors used in this paper are: the primary sector, the manufacturing sector, the ordinary service sector and the advanced service sector.

implies that there is a strong negative impact of firm entry in all sectors. This is in line with what one could expect, since there is less need for individuals to start their own business when compared to situations where the employment rate is low. If a municipality or a region has a high level of education among its citizens, there is a strong negative impact on the entry of new firms in all sectors except in the advanced service sector where the impact is positive. Further, the presence of many small firms in different sectors also has a strong positive significant impact on new firm formation in all sectors.

4.2 Firm Exit

The dependent variable is defined as exit of firms in each one of our four sectors, for time period 1993–2004 (Table 4).

Local accessibility to GRP has a strong negative significant impact on firm exit in all sectors except in the ordinary service sector. External accessibility to GRP also has a strong significant impact on entry of new firms for all sectors. In this case the impact is positive, which means that given that a municipality has a high degree of external accessibility to GRP, firm exit is assumed to increase. As in the case of firm entry, a high employment rate and a high level of education implies that there is a strong negative impact of firm exit in all sectors. Further, the presence of many small firms in the different sectors also has a strong positive significant impact on firm exit in all sectors, i.e. the higher share of small firms the higher the exit of firms, for all sectors.

Table 4 Results from the FEVD regressions for firm exit

Dependent variable	FEVD (fixed effects vector decomposition)			
	Entry (1) (primary sector)	Entry (2) (manufacturing sector)	Entry (3) (ordinary service sector)	Entry (4) (advanced service sector)
Local accessibility to GRP	-0.877 (4.80)***	-0.134 (2.84)***	0.071 (1.63)	-0.355 (4.19)***
External accessibility to GRP	0.945 (11.50)***	0.197 (9.22)***	0.293 (14.60)***	0.116 (3.04)***
Education	-0.492 (5.50)***	-0.112 (4.84)***	-0.267 (12.21)***	-0.253 (6.13)***
Employment rate	-0.997 (14.10)***	-0.718 (33.92)***	-0.463 (25.33)***	-0.673 (20.00)***
Share of small firms	0.060 (1.16)	0.237 (17.58)***	0.142 (11.44)***	0.191 (7.95)***
Constant	0.968 (15.41)***	0.508 (27.85)***	0.416 (26.04)***	0.604 (20.49)***
Observations	3,420	3,420	3,420	3,420
R-squared	0.40	0.38	0.32	0.31

***Significant at 1%

Table 5 Results from the FEVD regressions for net entry of firms

Dependent variable	FEVD (fixed effects vector decomposition)			
	Entry (1) (primary sector)	Entry (2) (manufacturing sector)	Entry (3) (ordinary service sector)	Entry (4) (advanced service sector)
Local accessibility	0.851	1.927	1.278	0.694
to GRP	(2.02)	(6.03)***	(5.78)***	(2.52)
External accessibility	0.199	0.618	0.649	0.528
to GRP	(1.05)	(4.54)***	(6.64)***	(4.23)***
Education	-0.568	-1.683	-0.748	-0.656
	(2.74)***	(8.97)***	(6.25)***	(4.64)***
Employment rate	0.273	1.237	0.438	-0.095
	(1.68)	(8.77)***	(5.10)***	(0.91)
Share of small firms	0.129	0.283	0.159	0.137
	(1.07)	(3.38)***	(2.61)***	(1.76)
Constant	-0.244	-1.021	-0.426	0.071
	(1.69)	(8.78)***	(5.70)***	(0.76)
Observations	3,420	3,420	3,420	3,420
R-squared	0.05	0.06	0.08	0.05

Significant at 10%, significant at 5%, ***significant at 1%

4.3 Net Entry of Firms

The dependent variable is defined as net entry of firms in our four sectors, i.e. firm entry – firm exit in each sector, for the time period 1993–2004 (Table 5).

Both local and external accessibility to GRP have a strong positive significant impact on net entry of new firms in all sectors. There is no such significant impact for the primary sector in the case of external accessibility to GRP. A high employment rate implies that there is a strong positive impact of net firm entry in the primary sector, the manufacturing sector, and in the ordinary service sector. A high level of education implies a strong negative significant impact on net entry of new firms in all sectors. As in the case of new firm formation and firm exit, the presence of many small firms in the different sectors also has a strong positive significant impact on new firm formation in all sectors except for the primary sector.

5 Conclusions

The purpose of the paper is to show how entrepreneurship conditions vary between regions of various sizes, and to analyse the theoretical arguments as to why large regions generally should generate more entrepreneurship. The purpose also covers analyzing empirically the role of regional size in explaining variations in total entrepreneurship and entrepreneurship in different sectors across functional regions, using data from Sweden for the period 1993–2004.

Using FEVD regressions, we estimate how the conditions for entrepreneurship vary between regions of various sizes. The empirical results from the estimated FEVD regressions show that local and external accessibility to GRP have a strong significant impact on both entry of new firms and on firm exit. For the primary sector and the manufacturing sector this impact is negative and for the ordinary service sector and the advanced service sector it is positive. Hence, both local and external accessibility to GRP are of great importance for the two different service sectors. However, accessibility to GRP is not that important for new firm formation in the primary sector and the manufacturing sector. Further, a high employment rate implies that there is a strong negative impact of firm entry in all sectors. This is in line with what one could expect, since there is less need for individuals to start their own businesses compared to times when employment rate is low. The presence of many small firms in the different sectors also has a strong positive significant impact on new firm formation in all sectors. Hence, the more small firms there are the higher the potential for new firm formation.

Appendix

Table A.1 Correlation matrix for the primary sector

	Entry (1)	Exit (1)	Net entry (1)	Local accessibility to GRP	External accessibility to GRP	Share of small firms	Employment rate	Education
Entry (1)	1.0000							
Exit (1)	0.0798	1.0000						
Net entry (1)	0.3344	-0.3124	1.0000					
Local accessibility to GRP	-0.2259	-0.0614	0.0119	1.0000				
External accessibility to GRP	-0.3087	-0.0843	0.0043	0.1571	1.0000			
Share of small firms	0.1571	0.0396	0.0119	-0.1655	0.1445	1.0000		
Employment rate	-0.1571	-0.0887	0.0054	-0.1175	0.2449	0.0462	1.0000	
Education	-0.3581	-0.0436	-0.0088	0.3806	0.5519	0.0926	0.2695	1.0000

Note: N = 3,420

Table A.2 Correlation matrix for the manufacturing sector

	Entry (1)	Exit (1)	Net entry (1)	Local accessibility to GRP	External accessibility to GRP	Share of small firms	Employment rate	Education
Entry (1)	1.0000							
Exit (1)	0.3088	1.0000						
Net entry (1)	0.4577	-0.4388	1.0000					
Local accessibility to GRP	-0.1341	-0.0255	0.0053	1.0000				
External accessibility to GRP	-0.1550	-0.0057	0.0319	0.1571	1.0000			
Share of small firms	0.1677	0.2565	0.0396	-0.1655	0.1445	1.0000		
Employment rate	-0.1841	-0.3346	0.0223	-0.1175	0.2449	0.0462	1.0000	
Education	-0.2994	-0.0959	0.0163	0.3806	0.5519	0.0926	0.2695	1.0000

Note: N = 3,420

Table A.3 Correlation matrix for the ordinary service sector

	Entry (1)	Exit (1)	Net entry (1)	Local accessibility to GRP	External accessibility to GRP	Share of small firms	Employment rate	Education
Entry (3)	1.0000							
Exit (3)	0.2709	1.0000						
Net entry (3)	0.4365	-0.4410	1.0000					
Local accessibility to GRP	0.1019	-0.0004	0.0573	1.0000				
External accessibility to GRP	-0.0062	0.0625	0.1068	0.1571	1.0000			
Share of small firms	0.1108	0.1707	0.0385	-0.1655	0.1445	1.0000		
Employment rate	-0.2040	-0.2006	0.0329	-0.1175	0.2449	0.0462	1.0000	
Education	-0.0097	-0.0594	0.0983	0.3806	0.5519	0.0926	0.2695	1.0000

Note: N = 3,420

Table A.4 Correlation matrix for the advanced service sector

	Entry (1)	Exit (1)	Net entry (1)	Local accessibility to GRP	External accessibility to GRP	Share of small firms	Employment rate	Education
Entry (1)	1.0000							
Exit (1)	0.0415	1.0000						
Net entry (1)	0.3619	-0.4745	1.0000					
Local accessibility to GRP	0.3484	-0.0909	0.0180	1.0000				
External accessibility to GRP	0.3857	-0.0889	0.0401	0.1571	1.0000			
Share of small firms	0.1723	0.1179	0.0263	-0.1655	0.1445	1.0000		
Employment rate	-0.0069	-0.0069	-0.1916	0.0050	-0.1175	0.0462	1.0000	
Education	0.5701	-0.1809	0.0202	0.3806	0.5519	0.0926	0.2695	1.0000

Note: N = 3,420

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