

CESIS Electronic Working Paper Series

Paper No. 404

**The location of new firms - Influence of commuting
behaviour**

**Mikaela Backman
Charlie Karlsson**

May, 2015

The location of new firms- Influence of commuting behaviour

Mikaela Backman*

Charlie Karlsson**

Abstract: In this paper, we analyse where people who become self-employed actually start their firms. In the entrepreneurship literature, it is generally assumed that individuals who start a firm start it where they live. We question this general assumption and show that this does not hold for commuters. Our results show that of those individuals that were short-distance commuters in 2007 and become self-employed in 2008, 90.1 percent started their firm in their work municipality. Only 9.4 percent started their firm in their residence municipality. For long-distance commuters, the figures were 93.6 and 6.4 percent, respectively. Our econometric estimations show that the probability to start a firm in the work municipality increases with the number of years as a commuter, with commuting to a larger municipality, and with the relative size of the work municipality compared to the municipality of residence. Our results indicate that the entrepreneurship literature must reconsider its general statement that individuals start firms where they live.

Keywords: entrepreneurship, self-employment, location, commuting, networks, micro-level data

JEL Codes: C21, J24, L26, R12

*Corresponding author, Centre for Entrepreneurship and Spatial Economics (CEnSE), Jönköping International Business School, Jönköping, Sweden, Mikaela.backman@ihh.hj.se

** CESIS, Jönköping International Business School, Jönköping, Sweden; Blekinge Institute of Technology, Karlskrona, Sweden; University of Southern Denmark, Sønderborg, Denmark

1. Introduction

In this paper, we analyse where people who become self-employed actually start their firms. In the entrepreneurship literature, it is generally assumed that individuals who start a firm start it where they live. Our aim is to scrutinize this general assumption by analysing the behaviour of all individuals and in particular commuters and their choice of firm location when becoming entrepreneurs. The firm location is in this paper divided into the choice of residence location or work location.

Now it is not perhaps totally clear what is meant with “where they live”, i.e. municipality of residence. Are we talking about the locality, the city or town, the labour market region, or even some larger region? We find strong reasons to explore this issue more in detail, since we in another paper (Backman and Karlsson, 2015) have shown that the decision of job commuters to become self-employed is positively influenced by the accessibility to entrepreneurs in their work locality, while the same accessibility for their home localities is insignificant. For us this opens up a clear possibility that not least commuters but also individuals with an earlier commuting career might rather start their firm in the work locality/former work locality than in their home locality. Our hypothesis is strengthened by the fact that most commuting takes place within labour market regions and that the dominating commuter streams go from surrounding localities to a central larger locality, which also by far provides the largest market potential in the labour market region. Since, theory and earlier research show that the intra-locality market potential is important for the decision to become self-employed, it seems reasonable that many in-commuters to the central locality that become self-employed locate their firm to the central locality. In this paper, we intend to give a nuanced picture to the issue of firm location.

Our empirical statistics show that of those individuals that were short-distance commuters in 2007 and become self-employed in 2008, 90.1 percent started their firm in their work municipality. Only 9.4 percent started their firm in their residence municipality. For long-distance commuters, the figures were 93.6 and 6.4 percent, respectively. Our econometric estimations including all individuals in Sweden show that the probability to start a firm in the work municipality increases with the number of years as a commuter, with commuting to a larger municipality, and if you have been a commuter in the last ten years. When focusing on only commuters we observe that commuting behaviour induces individuals to start their firm in their municipality of work and discourages individuals to start their firm in the home location. We also find that the relative size in terms of population and purchasing power of the work municipality compared to the municipality of residence are important determinants where to locate their firm. Commuters are more prone to start their firm in the work municipality if this location is relatively larger than their home municipality. The same pattern is found for the relative access to self-employed in the work municipality compared to the municipality of residence. Hence, the importance of agglomeration benefits for new firm locations is confirmed. Our results contradict the general statement in the entrepreneurship literature that individuals start firms where they live.

The paper is organized as follows: In Section 2 we discuss theoretically the determinants of the location of new firms. Our data, variables, and the descriptive statistics and is presented in

section 3. Our empirical design and our results are presented in Section 5. Section 5 concludes the paper.

2. The determinants of new firm location

In this section, we discuss the factors that determine the location of new firms with a focus on firms started by individuals, a topic that has been analysed from several different theoretical perspectives. Hayter (1997) distinguish between three major theoretical perspectives: neoclassical, behavioural and institutional.

Basic neoclassical theory assumes rational economic agents with perfect information that chooses the optimal location for new firms from a finite set of potential locations. According to this approach, the optimal location for a new firm is the location, which maximizes the profits of the new firm. Thus, the optimal location is decided based upon available production technologies and external factors, i.e., the demand-, the supply- and cost- conditions including transportation costs offered by different possible locations. In the most basic setting, optimal location is a matter only of profit maximization. The economic agent has no personal preferences concerning the optimal location of the new firm. This implies that the basic neo-classical theory has its limitations when it comes to explaining the location of new firm started by entrepreneurs, since we can expect that these individuals also probably have preferences concerning where to live and hence are prepared to trade a lower profit for the opportunity to live in a preferred location. Thus, we have strong reasons to analyse the new firm location choices by entrepreneurs from a utility maximization perspective rather than a profit maximisation perspective.

The behavioural perspective shares the basic starting points as the neoclassical theory but claims that economic agents have limited information and knowledge about the characteristics of all potential locations for a new firm and thus take their location decisions in a situation characterized by a fundamental uncertainty. This perspective puts much more stress on the characteristics of the entrepreneurs in terms of age, education, occupation, experience (in particular, earlier entrepreneurial experiences), place of residence, etc. in the decisions on where to locate new firms.

Lastly, the institutional perspective stresses that entrepreneurs have to operate within various networks including peers, owners, customers, suppliers, banks, competitors, trade unions, universities, government organizations, etc. It is in this perspective wrong to understand entrepreneurs as lone individuals who only rely on their own extraordinary efforts, resources and talent to deal with the problems and difficulties involved in the establishment and location of a new firm. The establishment and location of a new firm is determined via a social process, as ideas, information, knowledge, business contacts and resources to a high extent are acquired through the entrepreneur's social networks. This implies that the location decision not only includes demand and supply factors. In addition, social and business relations and networks, regulations and possible location grants must be taken into consideration when the location of new firms is decided. However, one can imagine that many potential entrepreneurs do not consider localities beyond their home or work locality as a potential location for their

new firm, since their main focus probably is what kind of firm to start (Stam, 2007). Actually, entrepreneurs are induced to locate their firm close to their place of living or their place of work, since their social and business networks normally are centred around these two places, which for non-commuters are the same place but which differ for commuters (Cooper and Folta, 2000; Parwada, 2008; Sorenson, 2005).

New entrepreneurs have several reasons to exhibit locational inertia, which implies that their location choice often is limited to place of living or place of work:

1. They can use their existing local networks to seek information, knowledge, customers, suppliers, employees, advisors, partners and financiers (Zander, 2004). Such behaviour reduces search costs and decreases uncertainty. It also allows the entrepreneur to use the credibility and trust he/she has developed in their various social, business and professional networks.
2. They have imperfect knowledge about alternative locations (Pred, 1967).
3. They have limited time, resources, methods and cognitive abilities to process and evaluate all information available about different locations (Simon, 1957).
4. They are affected by normative motivations concerning some relationships, for example to family and friends, which goes beyond rational instrumental motivations, since a continuation of these relationships might only be possible if the entrepreneur stays in his current location (Dahl and Sorenson, 2009).
5. They may begin as part-time entrepreneurs, possibly home-based, and wait to scale up the business to a full-time engagement until the venture seems sufficiently promising (Wennberg et al., 2007).
6. They may have a spouse that in the current location can keep a job so that the family has a steady income flow, while the entrepreneur devotes his/her full energy to the start-up project (Hanson, 2003).

However, what is missing in the listing above is the fact that many working people actually commute to another location and thus via their job gather information and knowledge about their work location and what it offers in terms of customers, suppliers, competitors and costs. In addition, they might build up business, professional and even personal links to people in the work location that are of great value both for identifying and evaluating entrepreneurial opportunities and for smoothing the start-up process. What we claim here is that it is the job location and not the home location that in general provides the critical conditions in terms of information, relations, customers, suppliers, etc. for starting a new firm. This is in principle very natural but this aspect seems to have been neglected in the literature in the field. New entrepreneurs generally seem to find it most profitable to start their firm where they previously worked. The new firm might have been run with a higher profit at other locations but due to lack of information, the entrepreneur does not consider them. However, we must consider that the start-up costs probably would have been higher in another location than the work or the home location.

Entrepreneurship is the result of the interaction between individuals with varying attributes and characteristics and the surrounding local, regional and national economic environment. In

the case of commuters that become entrepreneurs, we ask the following fundamental question: what characteristics of individuals, locations and interaction options are critical in the decision to start-up the new firm in the work location rather than the home location of these entrepreneurs?

When we analyse entrepreneurship from a spatial perspective we must acknowledge that attributes and characteristics of individuals vary between locations, that the characteristics of the economic environment differ between different locations and the conditions for interaction vary between different locations. Certainly, the supply of (potential) entrepreneurs varies between different locations due both to the fact that locations vary in size and that people in different locations vary in terms of resources, knowledge, abilities, experiences, and preferences. When it comes to information about localities and regions, we can divide the potential entrepreneurs into three groups:

1. Non-commuters that have specific information only about their home (and by definition work) locality and their home (work) region.
2. Short-distance commuters, e.g. intra-regional commuters, who have specific information about their home locality, their work locality and their home (work) region.
3. Long-distance commuters, e.g. inter-regional commuters, who have specific information about their home locality, their home region, their work locality and their work region.

Using this division, we present the following three hypotheses:

- *H1*: Commuting behaviour will influence the location choices of potential entrepreneurs.

The motivation for this hypothesis is simple as the commuting behaviour provides the individual with crucial knowledge, information used when making their location decision. One aspect that we consider is the time that an individual have been a commuter. We assume that the probability of starting a firm in the work location rather than the home location increase with the time that the individual has been a commuter. The longer a person has worked in a location the more information he/she has been able to gather and the more extensive the network that he/she has been able to build up. We expect that the probability of starting a firm in another location than the home (= work) location for a non-commuter decreases with the time the individual have lived in the actual location and the time since he/she was a commuter. For commuters we expect that the probability that they will start a firm in the work locality decreases the longer they have lived in their actual home locality and increases with the length of the time they have been commuters and if they commute to a larger locality.

- *H2*: we assume that the probability of starting a firm in work location rather than the home location increases if the new start-up is critically dependent upon high accessibility to customers and/or suppliers.

The motivation for this hypothesis follows partly from the motivation for hypotheses one. The commuter has over time possibilities to build up information about and/or links to suppliers

and customers in the work location that might be critical since most start-ups are dependent upon close links to customers and/or suppliers. It seems obvious that the richer the economic environment in the work location compared to the home location, the more natural it is to start a new firm in the work location.

- *H3*: we assume that the probability of starting a firm in the work location rather than the home location increases the richer the entrepreneurship networks in the work location compared with the home location.

There are strong theoretical and empirical reasons to assume that entrepreneurship networks play a fundamental role in the entrepreneurial process by providing examples and information, knowledge and advice to potential entrepreneurs.

3. Data, descriptive statistics and empirical design

The data used in this study is provided by Statistics Sweden and covers all individuals in Sweden for several years. Here we work with a subset that contains all individuals that were employed in the year 2007, approximately four million individuals. We are in particular interested in those individuals that were employed in 2007 and change their employment status and become self-employed a year after. Before moving to the empirical estimations we were analyse the determinants of where individuals start their firm, we start with the general pattern among commuters and non-commuters on where they decide to start their firm. We observe that 202,008 individuals changed from being employed in 2007 to becoming self-employed in 2008 out of those 36,644 commuted in 2007. Of those that commuted the lion's share commuted to another municipality in the same local labour market region where their home municipality is located. The distribution across the different categories is demonstrated in the next table.

Table 1. Distribution of self-employed across commuters and non-commuters

Commuters			
Type	Commuters (2007)	Commuters within the region (2007)	Commuters outside the region (2007)
Total	1 060 158	815 674	244 484
Self-employed 2008 (%)	34 644 (100)	28 404 (100)	6 240 (100)
Self-employed, started a firm outside municipality of residence 2008 (%)	32 580 (94.0)	26 738 (94.1)	5 842 (93.6)
Self-employed, started a firm in the municipality of residence 2008 (%)	2 064 (6.0)	1 666 (5.9)	398 (6.4)
Non-commuters (2007)			
Total	2 084 395		
Self-employed 2008 (%)	167 364 (100)		
Self-employed, started a firm outside municipality of residence 2008 (%)	1 002 (0.6)		
Self-employed, started a firm in the municipality of residence 2008 (%)	166 362 (99.4)		

The table demonstrates that commuters tend to start firms outside their municipality of residence. 94 percent of the self-employed that commuted in 2007 and was self-employed in 2008 started their firm outside their municipality of residence. In the case of those that commuted within the labour market region, approximately 91 percent started their firm in another municipality in the region than their residence municipality. In the case of non-commuters the opposite pattern tend to apply where over 99 percent of the self-employed started their firm in the municipality of residence. The table clearly shows that commuters tend to behave differently compared to non-commuters when it comes to the location of their new firm.

In order to determine where individuals start firm and if this tendency differs across individuals based on their commuting patterns we perform a multinomial logit estimation where the dependent variable is start a firm in the residence location, work location or other locations (used as a base). The location is based on the municipal level; municipality is the lowest administrative border in Sweden of which there are 290.

The commuting aspect and the location choice of the individual is captured by six independent variables that measure: (i) commuting within the labour market region (*Commuter, short*) (ii), commuting outside the own labour market region (*Commuter, long*), (iii) if the individual have lived in the same municipality in the last five years (*Stayer*), (iv) if the individual have commuted in any of the last ten years (*Commuting history*), (v) how long the individual have commuted (*Years of commuting*), and (vi) if the individual have commuted to a more urban municipality (*Commuter, urban*).

The first two variables capture if the firm founder was a commuter the year before he/she started the firm. We separate those that commute within a labour market region and those who commute to another labour market region. Labour market regions, which approximate functional economic regions, are formed by grouping several municipalities between which the commuting intensity is high. In this case, Sweden's 290 municipalities form 81 functional regions.

The functional regions form a common market for labour, housing, and household and company services, and form the home market for most firms, i.e. the concepts of functional region and local labour market can be used interchangeably. Economic agents interact in a variety of ways but face-to-face contacts mainly take place inside the functional region. There are often many population centres of varying sizes in the functional region but it is normally only the largest population centre, i.e. the central municipality, that is large enough to support services that demand frequent face-to-face contacts (Johansson et al., 2003). The assumption used in this paper is that individuals commuting within the same functional region, even though commuting to another municipality, do not reach a labour market that is significantly different from the labour market of the municipality of residence. Those commuting outside the functional region reach have the opportunity to reach another local labour market with perhaps more advantageous economic features, such as a larger market potential.

The third variable (*Stayer*) is not a direct measure of the commuting behaviour but controls for if the individual has lived in the same municipality for the last five years. This variable is included to determine if local knowledge about the economic environment is important in the decision of establishing and locate a firm. We assume that an individual that lived in the same location for five years have had time to evaluate the economic environment and also had time to establish relations and networks. The fourth (*Commuting history*) and fifth variable (*Years of commuting*) measure if the individual has commuted in the past and we measure the commuting behaviour in the last ten years. This variable is intended to capture the knowledge and networks that an individual have built up in the past that is still valuable if the person decides to start a firm and influences the choice of location. Using the same type of argumentation, the fifth variable captures how many years the individual has been a commuter over the last ten years. We assume that it takes time to gather information and knowledge about the working environment and possible economic opportunities as well as to build relations and networks.

In addition to the time aspect, we also consider the geographical aspect of commuting, i.e. what type of municipality the individual is commuting. This aspect is captured in the last variable (*Commuter, urban*). Here, we distinguish whether an individual has commuted up or down the urban-rural hierarchy. Sweden's municipalities are in this case defined as either central municipalities or peripheral municipalities. Central municipalities are the largest municipality within each functional region and have the highest inward commuting in absolute terms in the functional region. The labour market in the central municipality normally functions as the engine of the whole region. To distinguish between urban and rural municipalities we use a regional taxonomy where we divide Sweden into four categories: a) metropolitan functional regions, b) central municipalities, c) peripheral municipalities in larger functional regions, and d) peripheral municipalities in small functional regions. Urban municipalities are defined as the two first categories and rural municipalities are defined as periphery municipalities.

The actual locational choices of potential entrepreneurs is also hypothesised to be determined by their individual attributes, by the characteristics of different localities and regions and the information about these localities and regions possessed by the potential entrepreneurs. Among the individual attributes, we believe that the human capital aspect of the individual is important but we also include immutable characteristics. The human capital of the individual is measured by four variables that capture different aspects of the individual's general human capital. We control for the education where both the type of education (*Education type*) and the length of the education (*Education length*) are included. The experience (*Experience*) of the individual as well as the occupation (*Occupation*) that the individual possesses is further included. The effect of human capital on individual's decision to become entrepreneurs is ambiguous as human capital-intensive individuals are a potential source of new entrepreneurs but have a high opportunity cost of starting a new firm (Parker, 2004). Skilled individuals embody various combinations of scientific, technological, and entrepreneurial knowledge that they have acquired through formal education, learning by doing, training on the job and other experiences. These individuals are also likely to encompass skills and abilities, such as evalu-

ate the potential and the risks of new knowledge and new business ideas to a varying degree. They also have access to knowledge intensive networks with other skilled individuals. Overall, human capital-rich individuals tend to have the potential to identify combinations of knowledge critical for generating new business ideas. Relating to the location choice of where human capital-rich individuals start their new firm, the empirical evidence is scarce. Given that, human capital-skilled individuals have the abilities they are more likely to find evaluate and find economic opportunities. These capabilities should be valid in both the residence and work location. What is perhaps most important is the economic environment of the home versus the work location. Individuals with high human capital are most likely to prosper in locations that experience agglomeration benefits, including knowledge spillovers.

Immutable characteristics, such as the gender of the individual (*Gender*) and if the individual is born outside Sweden (*Foreign*), influence the choice to start a firm and possibly also the location choice. Men are more likely to establish a new firm (Arenius and Minniti, 2005; Blanchflower, 2000). Regarding the choice of location, men tend to overall commute longer distances and in more directions (Blumen, 1994; Ong and Blumenberg, 1998). This indicate that men are more likely to commute across municipal borders and be classified as commuters in this paper, which increases that they if they become self-employed will locate the firm in their work municipality. They are also more likely to experience other economic environments and be exposed to more economic opportunities. Individuals with a foreign background are often pushed into becoming entrepreneurs, due to lack of employment opportunities (Hormiga and Bolívar-Cruz, 2014; Light and Rosenstein, 1995; Yoon, 1997). However, they often live in segregated enclaves with strong local ethnic networks, which might make them more inclined to locate the firm in the home municipality if they become self-employed.

Concerning the characteristics of localities and regions, we expect the following characteristics to be important: density of the municipality of residence (*Density, residence municipality*) and density of the municipality of work (*Density, work municipality*). This variable captures the possible local agglomeration benefits such as the matching, sharing and learning, described in Duranton and Puga (2004). This variable also captures the knowledge base and knowledge accessibility in a municipality as it is highly correlated with for example the share of individuals with a higher education, and the share of individuals with a skill-based occupation. We also control for the industry structures by capturing the competition level in the municipality of work and residence (*Competition, residence municipality; Competition, work municipality*). The municipal, local, competition is defined using a relative measure following (Glaeser et al., 1992).

$$Competition_s = \left(\frac{w_s}{e_s}\right) / \left(\frac{w}{e}\right) \quad (1)$$

where w is the number of establishments in a sector, e is the number of employees in a sector, and s denotes the municipality. If the value exceeds one, then the sector in a municipality is more competitive than the national average. Thus, it has more firms relative to its size compared to the national average. A value exceeding one can also indicate that the firms in a certain sector in this municipality are smaller than the national average. The measure of competition reflects “Porter externalities”. Porter (1990) argued that local competition is favourable,

since it stimulates innovation and information spreading that is beneficial in the creation of new firms. The next table gives an overview of the chosen variables and their summary statistics.

Table 2. Description of variables and summary statistics (N=3 180 884)

Description	Indicator	Exp. sign	Mean	St. dev
<i>Dependent variable</i>				
Firm location in 2008, 1=firm location is the municipality of residence, 2=firm location is the municipality of work, 3=otherwise			0.071	0.288
<i>Independent variable</i>				
<i>Individual level</i>				
Dummy, 1=commuted within the functional region, 0=otherwise	<i>Commuter, short</i>	+	0.259	0.438
Dummy, 1=commuted outside the functional region, 0=otherwise	<i>Commuter, long</i>	+	0.078	0.268
Dummy, 1=Lived in the same municipality for the last five years, 0=otherwise	<i>Stayer</i>	+	0.832	0.374
Dummy, 1=Commuted in any of the last ten years, 0=otherwise	<i>Commuting history</i>	+	0.542	0.498
How many years the individual has commuted over the past ten years	<i>Years of commuting</i>	+	2.835	3.414
Dummy, 1=Commuted to a more urban municipality, 0=otherwise	<i>Commuter, urban</i>	+	0.149	0.356
Age of individual-6-number of schooling years	<i>Experience</i>	+	26.541	12.380
Experience square	<i>Experience²</i>	-	857.726	669.463
Number of schooling years	<i>Education length</i>	+/-	12.389	2.353
Categorisation of different educational tracks (15 in total)	<i>Education type</i>	NA	NA	NA
Categorisation of different occupations (4 in total, cognitive occupations, occupations in management and administration, social occupations, and standardised occupations) ^a	<i>Occupation</i>	NA	NA	NA
Dummy, 1=male, 0=female	<i>Gender</i>	+	0.526	0.499
Dummy, 1=born in Sweden, 0=otherwise	<i>Foreign</i>	+	0.114	0.317
<i>Municipal level</i>				
Population density, municipality of residence	<i>Density, residence municipality</i>	+	6.365	1.246
Population density, municipality of work	<i>Density, work municipality</i>	+	8.454	1.438
Competition defined in Equation 1, municipality of residence	<i>Competition, residence municipality</i>	+/-	1.017	0.282
Competition defined in Equation 1, municipality of work	<i>Competition, work municipality</i>	+/-	0.821	0.222

^a Based on the taxonomy by Johansson and Klaesson (2011).

With regard to the commuting behaviour, the summary statistics demonstrates that approximately 26 percent of the individuals commute within the functional region and eight percent commute across functional region borders. More than half of the individuals have had some commuting during the last ten years and the average years of commuting are slightly less than

three years. The lion's share (over 80 percent) of the individuals has stayed in the same residence location for the last five years.

4. The empirical analysis

In the empirical estimations, we perform a multinomial logit estimation where the dependent variable is start a firm in the residence location or in another location except the residence location. We do not order the different outcomes in the multinomial logit model, as there is no natural preference order. The economic environment proxy by the size and competition level in the residence and the work municipality is highly correlated and is therefore estimated in separate estimations. Table 3 reports the marginal effect for the different outcomes. The reason we use marginal effects is that enables us to determine the effect of commuting activities (in a probability scale) on where to locate the firm. The first table includes all employed individuals in 2007 and their choice on where to start their firm. We differentiate between two outcomes: in the home municipality or not in the home municipality.

Table 3. Multinomial logit estimation, marginal effects.

Dependent variable: Firm location in 2008, 1=firm location is the municipality of residence, 2= firm location is the municipality of work

	Outcome 1 (Firm location is the municipality of residence)		Outcome 2 (Firm location is not the municipality of work)	
	<i>Economic environment: Not home</i>	<i>Economic environment: Home</i>	<i>Economic environment: Not home</i>	<i>Economic environment: Home</i>
<i>Commuter, short</i>	-0.013** (0.0003)	-0.013** (0.0004)	0.004** (0.0003)	0.004** (0.0003)
<i>Commuter, long</i>	-0.009** (0.0003)	-0.009** (0.0003)	0.005** (0.0003)	0.005** (0.0004)
<i>Years of commuting</i>	-0.001** (0.0001)	-0.001** (0.0001)	0.0003** (0.0001)	0.0003** (0.0001)
<i>Commuter, urban</i>	-0.006** (0.0002)	-0.007** (0.0003)	0.0001 (0.0003)	0.0001 (0.0003)
<i>Commuting history</i>	0.001** (0.0001)	0.001** (0.0001)	0.001** (0.0001)	0.001** (0.0001)
<i>Stayer</i>	-0.0004** (0.0002)	-0.0004** (0.0003)	-0.0001** (0.0001)	-0.0001** (0.0002)
<i>Experience</i>	0.0003** (0.0001)	0.0003** (0.0002)	0.00002** (0.0003)	0.00002** (0.0003)
<i>Experience²</i>	-0.0001** (0.0001)	-0.00001** (0.0001)	-0.0001** (0.0001)	-0.0001** (0.0001)
<i>Education length</i>	0.0004** (0.0002)	0.0004** (0.00003)	0.00001** (0.0001)	0.00001** (0.0001)
<i>Gender</i>	0.007** (0.0002)	0.007** (0.0002)	0.001** (0.0001)	0.001** (0.0001)
<i>Foreign</i>	0.00001 (0.0001)	0.00002 (0.0002)	-0.0001** (0.0001)	-0.0001** (0.0001)
<i>Education type</i>	YES	YES	YES	YES
<i>Occupation</i>	YES	YES	YES	YES
<i>Municipality level</i>				
<i>Density, residence municipality</i>	-	0.0003** (0.0001)	-	0.00003** (0.0001)

<i>Density, work municipality</i>	0.0002 (0.0001)	-	0.00001 (0.0001)	-
<i>Competition, residence municipality</i>	-	-0.009** (0.001)	-	-0.0002** (0.0001)
<i>Competition, work municipality</i>	-0.011** (0.001)	-	-0.0004** (0.0001)	-
<i>Pseudo R2</i>	0.28	0.28	0.28	0.28
<i>N</i>	3 144 553		3 144 553	

**, * indicate significant at the 1 and 5 percent level respectively. Cluster standards at the municipal level in parenthesis.

Our empirical results give us no reasons to reject our hypotheses. Starting with the notion whether an individual commutes or not we observe that being a commuter increases the probability to start a firm in the municipality of work and reduces the probability to start a firm in the municipality of residence, confirming the first hypothesis. This is true for both short- and long-distance commuters. This results implies that individuals that commute build up a network with customers, clients and other business contacts that is valuable and useful when deciding to set up a own firm (Backman and Karlsson, 2015). The network aspect is important in this aspect as it provides an individual with information, knowledge, expertise, contacts, resources and support (Borgatti and Halgin, 2011; Burt, 1992; Podolny and Page, 1998). The network is built up by the professional and private links and connections (Lincoln and Miller, 1979; McPherson et al., 2001; Rosenthal and Strange, 2008). These result imply that the professional networks is more significant compared to the personal networks. The negative influence commuting have on choosing to set up the firm in the municipality of residence strengthens this claim as it implies that commuters do not only find their municipality of work more appealing but are discouraged to set up the firm in the municipality where they live. This variable can also capture the fact that individuals choose to commute to locations that have a thicker and larger labour market. These characteristics are often needed when setting up a new firm and it is therefore natural that commuters choose their municipality of work over the municipality of residence. The marginal effect implies that the short-distance commuting have a larger negative effect on the probability to become an entrepreneur and set up the firm in the municipality of residence compared to long-distance commuting. In the case of individuals that decide to start their firm in the municipality of work it is the long-distance commuting that has a marginally larger influence.

Years of commuting is significant and has the expected signs. It increases the probability to locate a firm to the work municipality and reduces the probability to locate it to the municipality of residence. This result strengthens the discussion in the previous section. As the years of commuting increases, commuters gain a better understanding of the economic environment in the work municipality and have a better option to build up their network. It is reasonable to assume that it takes some time for an individual to learn about the economic opportunities that exist in a location. The same applies to building networks as it as dependent on relationships over time (Thorelli, 1986).

Up to now, we have focused on the presence of commuting and the length of the commuting and now we turn to the question of where individuals commute. In this paper, municipalities are classified as being either urban or rural and we analyse if commuting to more urban locations influence where individuals choose to start their firm. Commuting to a larger municipal-

ity decreases the probability to locate a firm to the municipality of residence but is insignificant for firm location in the work municipality. The results imply that those that commute to more urban locations are less likely to start the firm in their home municipality. Urban locations have a higher market potential that spur entrepreneurial activities (Delgado et al., 2010). Having a commuting history increases the overall probability to start a firm anywhere. This might indicate that commuting contributes to develop ideas, business opportunities, contacts, etc. that increase the probability that individuals become self-employed.

Being a stayer reduces overall the probability to start a firm in the home municipality as well as the work municipality. This result is surprising, as one would expect that individuals living in the same location for a longer period are able to exploit and recognise economic opportunities.

The control variables at the individual level show that experience (age) increases the probability to start a firm both in the location of residence and work, but with a marginal decreasing effect. This reflects that elder individuals (up to a certain point) are more likely to start a firm, regardless of location. Having a higher education in terms of years of schooling increases the probability to start a firm both in the home and work municipality. The marginal effect is slightly higher in the case of starting your firm in the residence municipality. Men are more likely to start their firm in both locations, i.e., home and work. Having a foreign background reduced the likelihood to start their firm in the municipality of work.

With regard to the economic environment, measured at the level of municipalities, we observe that the density of the work municipality has a positive influence on the tendency to start their firm in both the home municipality as well as the work municipality. The competition in the residence and the work municipality has a negative influence on the probability to start a firm anywhere. As a robustness test the same estimations has also been performed with the access to other self-employed as control variables at the municipal level. The results show that access to other self-employed in the home and work environment has a positive significant effect on the location choice of self-employment to start their firm in their residence location.

As the result shows, there is a tendency that commuters locate their firm in their location of work. In the next step, we therefore do the same estimations as Table 3 but limit the sample to only those that are commuters in 2007 and started their own firm. In this estimation, we drop the variables on some of the commuting aspects as they are taken for given as we only have commuters in the sample. The results are presented in Table 4.

Table 4. Multinomial logit estimation, marginal effects, only for commuters.

Dependent variable: Firm location in 2008, 1=firm location is the municipality of residence, 2= firm location is the municipality of work, base: firms located in other municipalities

	Outcome 1 (Firm location is the municipality of residence)		Outcome 2 (Firm location is the municipality of work)	
	<i>Economic environment: Work</i>	<i>Economic environment: Home</i>	<i>Economic environment: Work</i>	<i>Economic environment: Home</i>
<i>Years of commuting</i>	-0.021** (0.001)	-0.021** (0.001)	0.057** (0.001)	0.056** (0.002)
<i>Commuter, urban</i>	-0.045** (0.007)	-0.042** (0.004)	0.179** (0.019)	0.179** (0.014)
<i>Stayer</i>	0.008** (0.003)	0.007** (0.003)	-0.047** (0.006)	-0.048** (0.006)
<i>Experience</i>	-0.0003** (0.0001)	-0.0003** (0.0001)	0.001** (0.0003)	0.001** (0.0002)
<i>Experience²</i>	0.0001** (0.0001)	0.0001** (0.0001)	-0.00004** (0.00002)	-0.00004** (0.00002)
<i>Education length</i>	0.001 (0.001)	0.001 (0.001)	-0.003 (0.001)	-0.003* (0.001)
<i>Gender</i>	-0.005* (0.002)	-0.006* (0.003)	0.015** (0.005)	0.014** (0.005)
<i>Foreign</i>	0.017** (0.003)	0.019** (0.003)	-0.017* (0.006)	-0.023* (0.006)
<i>Education type</i>	YES	YES	YES	YES
<i>Occupation</i>	YES	YES	YES	YES
Municipality level				
<i>Density, residence municipality</i>	-	-0.0003 (0.002)	-	0.002 (0.006)
<i>Density, work municipality</i>	0.002 (0.002)	-	-0.006 (0.004)	-
<i>Competition, residence municipality</i>	-	0.008 (0.001)	-	0.039 (0.029)
<i>Competition, work municipality</i>	-0.004 (0.006)	-	0.038* (0.014)	-
<i>Relative size (size of work municipality/size of residence municipality)</i>	-0.00004 (0.0001)	-0.00003 (0.0001)	0.001** (0.0001)	0.001** (0.0002)
<i>Pseudo R2</i>	0.33	0.33	0.33	0.33
<i>N</i>	34 644		34 644	

**, * indicate significant at the 1 and 5 percent level respectively. Cluster standards at the municipal level in parenthesis.

In addition, in this case our results do not give us any reasons to reject our hypotheses. A larger number of commuting years increases the probability to start a firm in the work municipality and reduces the probability of locating it to the municipality of residence. We find the same effects for those individuals that commute to larger municipalities. Hence, when analyse only commuters, and where they choose to start their firm, we find that the commuting behaviour induces individuals to start their firm in the municipality of residence. The biggest marginal effect is observed for where the individual commutes where those commuting to more urban locations is more likely to start their firm in that location, supporting the findings of the importance of market potential for entrepreneurial behaviour and choice of location when starting a new firm.

We observe that being a stayer reduces the probability to locate the firm to the work municipality and increases the probability to locate the firm to the municipality of residence. This is quite reasonable, since if you have lived longer at a place you have had more time to learn about the potential of the place and to build relations and networks.

It is interesting to observe that the individual control variables show opposite signs regarding where to locate the firm concerning all variables. Being more experienced (being older) and male induces commuters to locate their firm in the municipality of work. Individuals with a foreign background and commutes are less likely to locate their firm in their municipality of work. Having more schooling years lowers the probability that commuters choose to start their firm in the municipality where they worked.

Furthermore, the larger the relative density of the work municipality compared to the municipality of residence the higher probability that a firm will be located in the work municipality, confirming the second hypothesis.

To further test the importance of the regional milieu and the robustness of the found relationships in the work and residence municipality, respectively we run the same estimations as in Table 4 but uses additional measures of the economic milieu. In a first case, we use another size measure we instead of the population density uses the access to wages. The accessibility measure is based on the studies by Johansson et al. (2002, 2003) and can be divided into three parts: (1) local accessibility, (2) intra-regional accessibility, and (3) extra-regional accessibility. For each of the categories the authors have pre-estimated a time-sensitivity parameter using data on commuters in Sweden. Combining all of the three accessibility measures gives the total accessibility for a municipality.

Local accessibility, A_L , is estimated by Equation 1 for municipality s located in a functional region, R . The average time distance between different postcode areas within the municipality is denoted by t_{ss} . N_s is the total wage sum for all inhabitants in the municipality.

$$A_L = \exp\{-\lambda_0 t_{ss}\} N_s \quad (2)$$

The economic agents in municipality s have access to wage sums, N_v , in other municipalities, v , that belong to the same functional region, R . The time distance is denoted by t_{sv} and is a measure for the average time between municipality s and municipality v . The intra-regional accessibility, A_{IR} , of municipality s is expressed in Equation 3.

$$A_{IR} = \sum_{v \in R, v \neq s} \exp\{-\lambda_1 t_{sv}\} N_v \quad (3)$$

Lastly, economic agents in municipality s have access to wage sums, N_k , in the municipality k outside the own functional region, R . The time distance is given by t_{sk} and measures the average time distance between municipality s and k . The extra-regional accessibility, A_{ER} , for municipality s is defined in Equation 4.

$$A_{ER} = \sum_{k \notin R} \exp\{-\lambda_2 t_{sk}\} N_k \quad (4)$$

The combination of all the accessibility measures at the local, intra-regional, and extra-regional level gives the total market potential in a municipality discounting by the time distance. The results from the access to wages are presented in Table 5. In Table 6 we use the same concept of accessibility measures but uses the access to other self-employed instead of access to wage sums. The individual variables are suppressed, as they are robust across the different estimations.

Table 5. Multinomial logit estimation, marginal effects, only for commuters. Additional measure of size: access to wage sums

Dependent variable: Firm location in 2008, 1=firm location is the municipality of residence, 2= firm location is the municipality of work, base: firms located in other municipalities

	Outcome 1 (Firm location is the municipality of residence)		Outcome 2 (Firm location is the municipality of work)	
	<i>Economic environment: Work</i>	<i>Economic environment: Home</i>	<i>Economic environment: Work</i>	<i>Economic environment: Home</i>
<i>Access to wage, residence municipality</i>	-	-0.001 (0.003)	-	0.002 (0.008)
<i>Access to wage, work municipality</i>	0.001 (0.003)	-	-0.007 (0.007)	-
<i>Competition, residence municipality</i>	-	0.006 (0.011)	-	0.048 (0.031)
<i>Competition, work municipality</i>	-0.001 (0.006)	-	0.029* (0.014)	-
<i>Relative size (Access to wage, work municipality/ Access to wage, residence municipality)</i>	-0.001** (0.0004)	-0.001 (0.0008)	0.006** (0.001)	0.007** (0.002)
<i>Pseudo R2</i>	0.32	0.33	0.32	0.33
<i>N</i>	34 644		34 644	

**, * indicate significant at the 1 and 5 percent level respectively. Cluster standards at the municipal level in parenthesis.

In Table 5, we see that the larger the relative purchasing power in the work municipality compared to the municipality of residence the higher the probability that a new firm will be located to the work municipality. This just shows that economic logic works. A larger market is preferred over a smaller market, again confirming the second hypothesis.

Table 6. Multinomial logit estimation, marginal effects, only for commuters. Access to other self-employed

Dependent variable: Firm location in 2008, 1=firm location is the municipality of residence, 2= firm location is the municipality of work, base: firms located in other municipalities

	Outcome 1 (Firm location is the municipality of residence)		Outcome 2 (Firm location is the municipality of work)	
	<i>Economic environment: Work</i>	<i>Economic environment: Home</i>	<i>Economic environment: Work</i>	<i>Economic environment: Home</i>
<i>Access to self-employed, residence municipality</i>	-	-0.001 (0.003)	-	0.003 (0.009)
<i>Access to self-employed, work municipality</i>	0.002 (0.003)	-	-0.008 (0.007)	-
<i>Competition, residence municipality</i>	-	0.006 (0.011)	-	0.048 (0.031)
<i>Competition, work municipality</i>	-0.001 (0.006)	-	0.028 (0.015)	-
<i>Relative size (Access to self-employed, work municipality/Access to self-employed, residence municipality)</i>	-0.002** (0.001)	-0.002 (0.001)	0.009** (0.002)	0.011** (0.003)
<i>Pseudo R2</i>	0.33	0.33	0.33	0.33
<i>N</i>	34 644		34 644	

**, * indicate significant at the 1 and 5 percent level respectively. Cluster standards at the municipal level in parenthesis.

In Table 6, we see that the relative strength of the entrepreneurship networks matters. The higher the accessibility to self-employed in the work municipality compared to the residence of work, the higher the probability that a new firm started by a commuter will be located in the work municipality, confirming the third hypothesis.

5. Conclusions

In this paper, we analyse the location choice of new firms. This topic is by no means new but we add to the literature by focusing on the location choice of self-employed, especially the location choice of commuters. Our view is that the notion that entrepreneurs start their firm in their location of residence needs to be broaden and analysed in more detailed and our results support this view. By using detailed register-data, on all Swedish employees, that provides information on the location of residence and location of work we can follow those individuals that change their employment status from being employed by a firm to becoming self-employed. This combined with their commuting behaviour and commuting history allow us to analyse if commuters differs from non-commuters in their choice of location and which factors that influence their location choice. We use municipal level to define their location of residence and location of work.

The descriptive statistics in this paper shows that more than nine out of ten commuters start their firm not in their residence location but in their work location. The notion that commuters choice of location differ from non-commuters is further stressed in our empirical estimation where we observe that the commuting behaviour (if the individual commutes short or long distances, how long the individual have commuted, where the individual commute) influence

individuals to start their firm outside their residence municipality. In a later stage where we focus on only commuters we demonstrate that commuting, the length of the commuting and commuting to more urban locations positively influence the commuter to start their firm in their location of work.

Thus, in our paper we are able to confirm and contradict some key aspects of entrepreneurship and entrepreneurial behaviour: (i) professional networks compared to personal connections tend to be more useful and important when choosing the location for starting a new firm, (ii) agglomeration benefits in denser and larger locations attracts individuals to start their firm in these locations, and (iii) finally not all entrepreneurs start their firm in their location of residence. The choice of firm location is dependent on individual and regional factors.

References

- Arenius, P., and Minniti, M. (2005). Perceptual Variables and Nascent Entrepreneurship. *Small Business Economics*, 24(3), 233-247.
- Backman, M., and Karlsson, C. (2015). Determinants of self-employment among commuters and non-commuters. *Papers in Regional Science*, n/a-n/a.
- Blanchflower, D. G. (2000). Self-employment in OECD countries. *Labour Economics*, 7(5), 471-505.
- Blumen, O. (1994). Gender Differences in the Journey to Work. *Urban Geography*, 15(3), 223-245.
- Borgatti, S. P., and Halgin, D. S. (2011). On Network Theory. *Organization Science*, 22(5), 1168-1181.
- Burt, R. S. (1992). *Structural Holes: The Holes Structure of Competition*. Cambridge, MA: Harvard University Press.
- Cooper, A. C., and Folta, T. B. (2000). Entrepreneurship and High Technology Clusters In D. L. Sexton and H. Landström (Eds.), *Handbook of Entrepreneurship* (pp. 348-367). Oxford: Blackwell.
- Dahl, M. S., and Sorenson, O. (2009). The embedded entrepreneur. *European Management Review*, 6(3), 172-181.
- Delgado, M., Porter, M. E., and Stern, S. (2010). Clusters and entrepreneurship. *Journal of Economic Geography*, 10(4), 495-518.
- Duranton, G., and Puga, D. (2004). Micro-foundations of urban agglomeration economies. In J. V. Henderson and J.-F. Thisse (Eds.), *Handbook of Regional and Urban Economics* (Vol. Volume 4, pp. 2063-2117). Amsterdam: Elsevier.
- Glaeser, E. L., Kallal, H. D., Scheinkman, J. A., and Shleifer, A. (1992). Growth in Cities. *Journal of Political Economy*, 100(6), 1126-1152.
- Hanson, S. (2003). Geographical and Feminist Perspectives on Entrepreneurship. *Geographische Zeitschrift*, 91, 1-23.
- Hayter, R. (1997). *The Dynamics of Industrial Location. The Factory, the Firm and the Production System*. New York, NY: Wiley.
- Hormiga, E., and Bolívar-Cruz, A. (2014). The relationship between the migration experience and risk perception: A factor in the decision to become an entrepreneur. *International Entrepreneurship and Management Journal*, 10(2), 297-317.
- Johansson, B., and Klaesson, J. (2011). Creative Milieus in the Stockholm region. In D. E. Andersson, Å. E. Andersson and C. Mellander (Eds.), *Handbook of Creative Cities*. Cheltenham: Edward Elgar Publishing Ltd.
- 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.
- Light, I., and Rosenstein, C. (1995). *Race, Ethnicity and Entrepreneurship in Urban America*. New York, NY: Aldine D. Gruyther.
- Lincoln, J. R., and Miller, J. (1979). Work and Friendship Ties in Organizations: A Comparative Analysis of Relation Networks. *Administrative Science Quarterly*, 24(2), 181-199.
- McPherson, M., Smith-Lovin, L., and Cook, J. M. (2001). Birds of a Feather: Homophily in Social Networks. *Annual Review of Sociology*, 27, 415-444.
- Ong, P., and Blumenberg, E. (1998). Job Access, Commute and Travel Burden among Welfare Recipients. *Urban Studies*, 35(1), 77-93.
- Parker, S. C. (2004). *The Economics of Self-Employment and Entrepreneurship*. Cambridge, UK: Cambridge University Press.

- Parwada, J. T. (2008). The Genesis of Home Bias? The Location and Portfolio Choices of Investment Company Start-Ups. *Journal of Financial and Quantitative Analysis*, 43, 245-266.
- Podolny, J. M., and Page, K. L. (1998). Network Forms of Organization. *Annual Review of Sociology*, 24(1), 57-76.
- Porter, M. E. (1990). *The Competitive Advantage of Nations*. London, UK: Macmillan.
- Pred, A. (1967). Behavior and Location: Foundations for a Geographic and Dynamic Location Theory *Lund Studies in Geography B* 27. Lund: University of Lund.
- Rosenthal, S. S., and Strange, W. C. (2008). The attenuation of human capital spillovers. *Journal of Urban Economics*, 64(2), 373-389.
- Simon, H. (1957). *Administrative Behavior* (2nd ed.). New York, NY: Macmillan.
- Sorenson, O. (2005). Social networks and industrial geography. In U. Cantner, E. Dinopoulos and R. Lanzillotti (Eds.), *Entrepreneurships, the New Economy and Public Policy* (pp. 55-69): Springer Berlin Heidelberg.
- Stam, E. (2007). Why Butterflies Don't Leave: Locational Behavior of Entrepreneurial Firms. *Economic Geography*, 83(1), 27-50.
- Thorelli, H. B. (1986). Networks: Between markets and hierarchies. *Strategic Management Journal*, 7(1), 37-51.
- Wennberg, K. J., Folta, T., and Delmar, F. (2007). A Real Options Model of Stepwise Entry into Self-Employment *The Office of Advocacy Small Business Working Papers* 07. Washington, D.C.
- Yoon, I. (1997). *On My Own: Korean Businesses and Race Relations in America*. Chicago: University of Chicago Press.
- Zander, I. (2004). The microfoundations of cluster stickiness—walking in the shoes of the entrepreneur. *Journal of International Management*, 10(2), 151-175.