Geography of starts-ups in Sweden – the role of human capital, social capital and industrial structure.

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Abstract

The aim of this study is to investigate the role of human and social capital in start-up creation process. Specifically it reveals the types of interaction between “soft” factors and institutional characteristics of the regions and investigates to what extent does the role of human and social capital varies in different institutional settings. To address this questions a multilevel model has been used which allows to capture relationships both in time and space. The data used in this paper stem from regional macrodata on human and social capital as well as industrial structure of Swedish economy. The study revealed important facts about start up creation processes, namely dual characteristic of entrepreneurship patterns in Sweden. In the metropolitan regions of the country human and social capital play much more important role than in the other regions, where the entrepreneurial activity is to large extent a result of current economic conditions and industrial settings.
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Introduction

In general terms entrepreneurship is perceived as very positive phenomenon as it is viewed to contribute to economic development in many dimensions. It is believed that entrepreneurs create new businesses, which supply customer with products and services, intensify competition and increase productivity (Acs 2006).

But more in-depth investigation of relationship between start-ups and employment growth present a more complex picture. There is well-established evidence also for Swedish case for an S-shaped pattern between start-ups and employment growth where positive effects of start-ups on regional employment change are followed by a negative impact. After initial positive direct effect on employment related to formation of new establishment a negative displacement effect can be observed due to crowding out (intensified competition). Finally positive effects on employment from indirect supply-side effects (such as higher efficiency, structural change through creative destruction etc.) can be observed (Fritsch and Mueller 2004) (Andersson and Noseleit, 2008).

Indirect effects of new business formation such as crowding out of competitors, improvement of supply conditions and increased competitiveness are of greater magnitude than the direct effect, i.e. the jobs created by the new entities and the peak of the positive impact of new businesses on regional development is reached about 8 years after entry (Fritsch and Mueller 2004).

Recent research provides also evidence of different importance of Small and Medium Enterprises (SME) for different types of economies. While in the developing countries small firms have higher job creation rates even after controlling for firm age in the developed countries, job creation rates are similar to those observed in large companies (Ayyagari at al 2014; Haltiwanger at al 2013; Dixon and Rollin 2012).

Moscarini and Postel-Vinay (2012) based on datasets for the United States, Denmark, and France, emphasize that large enterprises destroy proportionally more jobs compared to small ones during a recession period but on the other hand they create more jobs during time of economic boom. According to Pedace’s (2010) study for the United States even when using data with precise information on workers and employers characteristics there is a positive relationship between the size of enterprise and workers’ wages due to, among other things, greater efficiency.
Despite of the fact that for historical reasons Swedish employment is more concentrated in large firms (Delmar and Davidsson 2000), findings suggest that for a developed country SME sector might present important and more stable source of employment as large companies.

Economic and geographic perspectives provide a good background for understanding the mechanisms that positively contribute to the creation of start-ups and development of small firms. For example, there is abundant and growing evidence for the role of human factor on the entrepreneurship development from various theoretical perspectives related to location theories - i.e. such as human capital theory (Heebels and Boschma 2011), creative class concept (Florida 2002), knowledge base (Asheim and Gertler 2005) and learning regions (Asheim and Isaken 2002). The dominant approach in research of innovation and development focuses in turn on geographic locations as entities offering certain business opportunities, human capital and knowledge transfer. Location of firms in regions with a large pool of human capital and where the potential suppliers and customers can be easily available is viewed in the literature as a major source of economic advantage (Armington & Acs 2002). Nevertheless this research focuses mainly on overall regional performance measured by employment or gross regional product. As emphasised by Westlund et al. (2014) and Grek et al. (2011), geographical factors are often neglected in studies focusing on entrepreneurship variations. While there is growing literature on relation between entrepreneurship and both human and social capital, Westlund et al. (2014) highlights the need for further analyses testing “sector-specific and region type-specific explanatory variables”.

**Aim and research questions**

Following Westlund’s recommendation the aim of this study is to better understand the role of human and social capital in start-up creation process:

- What is the interaction between “soft” factors and institutional characteristics of the regions?
- To what extent does the role of human and social capital vary in different institutional settings?

In this study the impact of the characteristics of geographical location on creation of microenterprises enterprises will be the main area of focus. The geographical location will be analysed on two levels. The local (municipality) level perspective allows for analysis of community specific factors such as human capital while regional (functional analysis region)
level permits to investigate an impact of institutional and historical factors which may play significant role on a larger scale.

**Theoretical background**

There are number of theoretical concepts that allow for better understanding of how different regional settings influence entrepreneurship. Apart from general factors, these concepts include widely understood human capital theory, social capital theory and the industry structure. These concepts emphasize various determinants of creation of new enterprises.

**General factors**

The act of forming an enterprise might result from very various needs of the entrepreneur and therefore have different impact on local economy (Amorós and Bosma 2013; Acs 2006). For the purpose of the Swedish context the most important distinction is the difference between necessity-driven and opportunity-driven entrepreneurs (Acs 2006).

While an opportunity-driven entrepreneur starts a business in response to perceived business opportunity and in assumption that this is the best available allocation of owned skills and resources, the necessity-driven entrepreneur is forced to start a business because of lack of other options i.e. because employment opportunities are missing or are unsatisfactory. In the latter case newly established enterprise is nothing more than a form of self-employment with poor perspectives for further development (Acs 2006).

Therefore a high level of entrepreneurship might not signalise economic boom but rather be a sign of job shortage and in extreme case it might lead to underdevelopment due to bad resource allocations (Amorós and Bosma 2013). In case of immigration attracting countries such as Sweden, population of migrants can constitute a group in potentially disadvantaged position on labour market due to lower presence of locally valued professional skills, weaker social networks and ethnical discrimination. Hence they might be a group with a higher than average share of necessity-driven entrepreneurs.

Hammarstedt (2001) shows that non-Nordic immigrants in Sweden have a statistically significant higher self-employment rate than the native population also when controlling for demographic factors such as age, gender and education. The study has also shown that “the probability of being self-employed is highest among individuals with a low education”. More recently the differences between immigrants and natives in terms of self-employment were
confirmed by Ohlsson et al. (2012). Yet the results of the study show that the ethnic context plays a rather minor role in explaining the differences in self-employment rates.

Swedish labour market is characterised by rather low and stable unemployment rate and generous welfare system which should generally reduce number of necessity-driven entrepreneurs. Nevertheless according to OECD (2011), the income from self-employment was one of main drivers of the widening income gap in Sweden. This might suggest increasing divergence of paths of development among necessity-driven and opportunity driven entrepreneurs in Sweden.

**Human capital perspective**

In case of Sweden a dimension allowing for distinguishing between necessity-driven and opportunity-driven entrepreneurs can be also the level of education attainment. According to the human capital theory, the differences in earned income can be explained by the divergence in the accumulated human capital, which can be proxied by education and experience (Mincer 1970). The better educated and the more experienced workers are, the more productive they can become and the higher are their wages. The importance of professional experience related to the activity of the newly established firm was confirmed by number of studies on firms from different sectors of economy (Klepper 2002; Heebels and Boschma 2011; Brouder and Eriksson 2013). Empirical research in economic geography has also shown that the human capital accumulated in regions might have positive external effects on the local labour market. This means that highly skilled workers in the given region improve the labour market opportunities for other workers in the same region (Moretti 2004; Henderson 2007;’ Winters 2013). Borggren et al. (2014) also underlines the importance of the content of the skills of recruited employees for the future development of rapidly growing firms. As pointed out Kim et al. (2006), a high level of human capital may be significant advantage when running an enterprise also when controlling for financial capital and family business background. In case of Sweden a positive correlation between higher education and entrepreneurship was confirmed by Klaessson and Larsson (2014), but almost only for specific fields of study/education: science, social sciences and business and law.

In empirical research (compare Block et. al. 2013 and Van der Sluis et al. 2008), the findings suggest that the relationship between human capital and entrepreneurship is more sophisticated than the one that a human capital models would imply. There is an evidence for U-shaped relationship between education and entrepreneurship: both lowest and highest
educated individuals can have higher propensity for entrepreneurship than average educated. However, but the former group is composed of necessity-driven mainly, while the latter includes more opportunity-driven entrepreneurs.

Social capital perspective

While human capital concerns personal skills and capabilities, the social capital is created through interactions among persons which facilitate certain types of actions (Coleman 1988). Social capital consists of obligations, expectations and trustworthiness, information channels and propensity to conform to social norms. Sandefur and Laumann (1998) identify three main benefits of social capital: information, influence and control, and social solidarity. High social capital allows for trust and cooperation among individuals and obeying law and social rules is beneficial to whole local community. In case of an entrepreneur it allows gathering and fulfilling obligations, exchanging information (and therefore saving time and money) and expect that obligations of the others will be paid on time.

Helliwell and Putnam (1995) and Putnam (2007) indicate higher social capital as the source of differences in economic growth. According to Putnam (2007) voting turnout can be one of the indicators of the level of social capital in the community, Scott and Storper (1995) underlines the importance of regional industrial culture in terms of mutual trust for the local economy development. According to Westlund and Bolton (2003) social capital can in fact both play an entrepreneurial-facilitating and an entrepreneurial-inhibiting role. While in general most of human networks corresponds to society’s interests some networks, mutual commitments, and loyalties might inhibit entrepreneurship, rather than facilitate it. Some relationships between individuals which can be qualified as a social capital from individual perspective such as gang membership or privileged treatment of acquaintances might produce results that are not welcome to the society as a whole and stifle entrepreneurship. According to Westlund et al. (2014) social capital, measured as firm’s perception of local public authorities attitudes towards entrepreneurship and the share of small businesses, influences start-up propensity in Swedish municipalities.

As already mentioned presence of immigrants might increase entrepreneurship propensity particularly for necessity-driven entrepreneurs. Immigration can also influence the rate of social capital in the society (Putnam 2007). The newcomers at the beginning of their stay at the point of arrival have obviously lower record of interactions with both natives and local institutions. Therefore it takes time for immigrants to reach the level of social trust
characteristic for the native population. On the other hand the immigrants can be characterised by a high level of social capital but only within their ethnic group, which represent social capital transferred from a point of departure and close tights with others community members established at a destination spot due to relative isolation from a natives group. According to Putnam (2007) a level of social trust is higher in homogenous than heterogeneous communities and diverse communities might experience lower governmental trust and lower civic engagement at least at the first stage of immigrants integration into the society. Therefore an impact of immigration on entrepreneurship can be ambiguous. On the one hand immigrants might be more inclined towards entrepreneurial activity, on the other hand they might have more limited opportunities to establish a company.

The other perspective on the role of immigrants is the creative class concept formulated by Florida (2002) where the presence of creative labour force is the most important factor in today’s economy. According to Florida (2002), the key determinants of productivity and innovativeness as well as entrepreneurship of the labour force are not only skills, experience and trust, but also creativity. The concept of creative class goes far beyond the traditional human and social capital idea as it gives human factor supreme position compared to capital and forms very strict requirements for development of this socioeconomic group. The creative class value meritocracy, diversity and individuality and is attracted by regions with 3Ts: Talent, Tolerance and Technology, which exemplifies its cultural, creative, and technological needs. Places that offer variety of creative job opportunities combined with “open climate” can experience high multidimensional growth (economic as well population or cultural) as the presence of creative class not only facilitates economic growth but also attracts more talented people. Therefore from the perspective of creative class, ethnically diverse environment can be considered as an asset regarding entrepreneurship culture.

In the Swedish context, Westlund et al. (2014) provides the evidence that different aspect of social capital related to civil society as well as to business climate such can positively contribute to propensity of establishing new enterprise. However, Eriksson at al (2013) show that while human and social capital are related to regional performance, social capital seem to play an important role in regional performance in terms of Gross Regional Product, but not in terms of employment.
Institutional factors

According to Acs (2006) there is an U-shaped relationship between entrepreneurial activity and economic development. In least developed economies specializing in agricultural products and small-scale manufacturing there might be high rates of non-agricultural self-employment due to large number of small manufacturing and service firms. When the economy develops towards manufacturing, firms become larger and rate of the self-employment is decreasing. Entering post-industrial period when the importance of service sector is growing results in raising number of microenterprises as service firms are smaller compared to manufacturing one and provide more opportunities for entrepreneurship. Also improvements in ICT (Information and Communication Technologies) may increase the returns to entrepreneurship as information exchange becomes less expensive.

As Sweden is one of the most developed countries, it might expect growing number of microenterprises and shift from wage work to entrepreneurial activity. Nevertheless the effect could be observed more intensively in the most advanced regions where industrial production has become less important. Armington and Acs (2002) report significant differences in new firm formation rates in industrial regions compared to the technologically progressive ones. Also, regions experiencing restructuring and transition from industry-focus to more advanced technologies, record higher rates of start-ups.

The opportunities for starting up a business depend strongly on the institutional conditions of registering a new company and financing a start up of a business. Moreover, the policies in various countries provide different rules regarding the property rights as well as the ways to resolve disagreements between enterprises. Hence the predictability of economic transactions varies across countries. Well defined and clear rules that are evenly enforced make it easier for entrepreneurs to start and develop their firms (World Bank 2013). International organisations such as Eurostat, OECD and World Bank offer comprehensive lists of indicators that measure in a comparable way the variation in the institutional factors of starting up a new business and making this business grow. However, while these reports indicate a huge diversity in the business climate across countries, it can be argued that little variation can be observed within countries, because most policies regarding businesses are country-specific, and not region-specific. Given that this study focuses on interregional differences in propensity for business start ups and concerns only one country, little attention will be paid to this kind of institutional context of starting up a company.
What however provides interesting regional context for measuring start-up propensity is regional industrial structure. As emphasised by Frenken et al. (2007) not only “the stock of inputs affects growth, but also the precise composition in a qualitative sense.” A presence of a set of complementary sectors within the region can trigger a higher growth rates through i.e. spillover effects compared to a presence of sectors that do not complement each other. Similarly, Porter (2000) argues that even if old clustering advantages have weakened due to globalisation, new have emerged owing to growing importance of the knowledge-based economy.

On the other hand proper portfolio strategy based on non-complementary sectors is particularly important from employment perspective as it can protect a region from external demand shocks. Therefore proper balance between specialization and a more diverse sector portfolio can be important for long-term development perspective (Frenken et al. 2007). Additionally as emphasized by Boschma (2005) although geographical proximity of related industries usually facilitates innovation through interactive learning and strengthening other dimensions of proximity it might also impede innovation process, as relying too much on certain sectors may cause the problem of lock-in and limit openness and flexibility.

In line with Frenken et al. (2007) the assumption can be made that a formation of new enterprises can be a part of spillover effects created by complementary sectors within the region. On the other hand if a demand shock appears formation of new enterprises can be a part of restructuring process in a region with properly diversified portfolio.

**Method and data**

**Research design**

To properly address the research questions set in this paper there is a need for methodological framework that provides opportunity to capture relationships both in time and space. The need for time perspective increase quality of the analysis as the use of repeated measures (data for the same municipalities observed across a number of years) can provide more robust results. Repeated observations allow for isolating the effects of unobserved differences between the units followed over time (Cameron and Trivedi 2005, p. 695).

As already mentioned analysis of geographical location on two levels allows to take properly spatial context into account: municipality level perspective allows for analysis of community specific factors such as abundance of human and social capital or industrial structure while
regional level (functional analysis region) permits to investigate an impact of institutional and historical factors which may play significant role on larger scale. The availability of these region-specific characteristics cannot be measured and controlled for directly, however, it is possible to take them into account by using multilevel models with random intercepts. Multilevel models have been so far rarely used in economic geography, but receive increasing attention (Srholec 2010). This approach gives certain advantages over use of OLS models which I elaborate on below.

Standard ordinary least squares regression assumes that the observations included in analysis are independent, specifically, we assume that the error terms are uncorrelated with one another. As explained above, this assumption does not hold in the hierarchical data set up. If this problem is ignored, the standard errors of the estimated regression coefficients are underestimated, confidence intervals are too narrow and p-values are too small. This in turn may lead to drawing false conclusions that a predictor has a statistically significant effect on the outcome while the effect could be ascribed to chance. Underestimation of standard errors is particularly severe for coefficients of contextual factors that are measured at the group level, e.g., an indicator describing the context of communities (fixed across years) or regions (fixed across years and communities within the same region). Multilevel models offer means to correct for correlation across observations and to avoid the risk of making type 1 errors of inference (Leckie 2013).

There are alternative solutions for dealing with the problem of correlated observations, even within standard regression framework and without using any sophisticated statistical techniques. For example, one can include a set of dummy variables for groups as explanatory variables in the model. However, adopting this approach is complicated when the number of groups is large or when the hierarchical data are organized over more than two levels.

An alternative strategy could be to include in the model explanatory variables that measure group characteristics that are believed to influence individual outcomes. Following this idea, one should include all the characteristics of communities that make period-specific observations alike, and we should also include all the characteristics of regions that make communities within the same region similar with respect to the start-up rate. However, the processes which lead to correlation of observation are complex and important sources these correlations are likely to be unmeasured and therefore never fully accounted for. Thus, in practice, this approach is not advisable as a way to solve the problem of clustering.
Obtaining correct standard errors is just one reason for using multilevel modelling; there are some statistical methods that can be used. However, multilevel modelling offers also other advantages, among others it enables examining the nature of between-group variability and heterogeneity of the effects of micro-level characteristics at the macro level. For example, it is possible to identify reasons why start-up rates differ across regions and it is also possible to see whether and how strongly the effects of characteristics of communities such as social capital vary across regions (Leckie 2013).

Finally an alternative approach to analysis of data that provide repeated measures for communities would be to adopt time series econometric techniques. However, these techniques focus on the time dimension and regional differences can be hardly explored, whereas this paper aims at concentrating on regional differences. Another technique that exploits repeated measures are panel data econometrics. Indeed, panel data random effect models are from formal point of view identical to the random intercept multilevel models estimated in this paper (cp. Cameron and Trivedi 2009, p. 300).

Method

The model used in this paper is a three level model which allows for controlling effects of municipality and region (FA-functional region). The lowest level in the model is year (cp. Goldstein and Noden 2003). Modelling social segregation. Oxford Review of Education, 29(2), 225-237., followed by municipality, meaning that specific periods are treated as repeated measures for each municipality.

Using repeated measures for municipalities instead of limiting the data to a cross-section for a single year provides more robust results. The data on start ups in any given year could in case of some municipalities diverge from their usual values due to some random shocks. Using data where municipalities are followed over time, provides an opportunity to seek more general patterns on start ups in the municipalities and eliminate such random influences or measurement errors.

The third level of the model is defined at the regional level, which means that municipalities are considered as nested within a region in which they are located. All explanatory variables included in estimation of the model are measured at the municipality level. However, due to the multilevel modelling approach, the region-specific factors that cannot be measured directly are controlled as well. Specifically, random intercept models assume two parts of the
error term: one at the level of municipalities and another at the level of the regions. The latter part of the error term captures unobserved factors common to all municipalities in the same region but different from municipalities in other regions, that may affect the start up rate. This means that if some resources are available to the entrepreneurs outside the municipality but within the same region, e.g. due to good transport and communication infrastructure, then the availability of these resources is taken into account and does not bias the results in this study. Apart from estimating a model for the whole Swedish economy, this study provides estimation results also for specific types of regions.

Data

As the time boundary set for preparation of one year master thesis is very limited this study could not take advantage of Astrid database available at Department of Geography and Economic History at Umeå University. Astrid database contains high-quality and unique microdata which could have been of great use in this study but extracting this kind of data requires scope of time above limits of this project. Therefore data used in this paper stem from open or subscribed access macrodata available for Swedish economy: Statistics Sweden - http://www.scb.se/ open access database of Swedish Statistical Office covering most of the social and economic aspects of Swedish Society; rAps-RIS database - https://www.h5.scb.se/raps/ regional statistics for subscribed access regarding population, housing, the labour market and regional economics maintained by Swedish Agency for Economic and Regional Growth (Tillväxtervet); Business Climate Database - http://www.foretagsklimat.se/downloads publicly available database on yearly recordings on business climate (Företagsklimat) in municipalities of Sweden, conducted by Federation of Swedish Enterprise (Svenskt Näringsliv). All data used in the model were collected for the period 2002-2012 on municipal level. It should be remarked that despite transparent method of data collection and open access to database data collected by Federation of Swedish Enterprise come from not fully neutral source from the point of view of public debate as it is in case of Statistics Sweden. Federation of Swedish Enterprise have its own public agenda and plans to support activities aiming to improve situation of Swedish entrepreneurs.

The data used in this study have a multilevel (or hierarchical) structure, since they include repeated observations over time (for the period 2002-2012) on communities, which are nested within geographical areas (functional FA-regions). I consider repeated observations for the same communities as “nested” within municipalities because we assume the start-ups rates in
consecutive years in the same community to be more similar than the number of start-ups in two different communities, since previous studies suggest that institutional and economic conditions of communities affect the entrepreneurship activity much stronger than any changes of these conditions across years within the same municipality. Following the same logic, start-up rates observed in municipalities located in the same regions can be more strongly correlated than start-ups in different regions.

Variables

In the model four types of variables are used: dependent variable, independent variables representing factors related to human resources, independent variables representing industrial resources and additional variables to control for certain local settings which might have impact on start-up propensity, corresponding to the theories described in the previous section.

*Dependent variable*

Data on start-ups come from rAps-RIS database provided by Swedish Agency for Economic and Regional Growth. The data character does not allow for dividing start-ups into different economic sectors, meaning that only aggregated numbers can be analysed.

The disadvantage of this kind of data is that it does not allow to investigate in which sectors of economy start-ups are created and therefore does not allow to for understanding which sectors play the most important or specific role in start-up creation.

To compute the value of StartUp variable used in analysis, a number of newly formed microenterprises (0-9 employees) per 10 000 inhabitants in working age (16-64) have been calculated. This approach is similar to Westlund et al. (2014), who also calculates a ratio of new businesses to the working age population. In the available data, the following categorises of newly formed enterprises were imposed: 0-9 employees, 10-49 employees and above 49 employees. In this study, larger enterprises (over 9 employees) were not taken into account as the foundation of such companies might be driven by different set of factors (e.g. direct foreign investments of international corporations) and is rather result of bigger business projects then a consequence of entrepreneurship of local population per se. Start-up rates per 10 000 inhabitants are presented on Map I.
Map I

Start-up rates in Sweden

Legend
Startup Rate
- <110
- 110 - 140
- 140 - 177
- 177 - 233
- 233 - 366

Kilometers
In line with many previous studies (Westlund et al. 2014, Eriksson et al. 2013, Eriksson and Forslund 2013), human capital is measured as a share of population with an education level equivalent to a bachelor’s degree or higher (three years or more) in the given community. This kind of data is publicly available at Statistics Sweden. The log value of this indicator is used to deal with a skewed distribution of the tertiary education attainment in the Swedish communities. Research of Westlund et al. 2014 confirmed positive relation between human capital and start-up propensity. Nevertheless based on results of Block et. al. (2013) and Van der Sluis et al. (2008) we can expect also a nonlinear relationship between human capital and entrepreneurship. If the group of businessmen in Swedish communities is composed of both necessity-driven and opportunity driven entrepreneurs, we can expect a U-shaped pattern. This is taken into account in analysis by implementing a square value of the variable has been incorporated into model.

In line Westlund and Bolton (2003) and Westlund et al. (2014) two types of social capital have been introduced in the model. The first one Business Social Capital, aims to assess attitude towards entrepreneurship of society and particularly local authorities and is based on a share of entrepreneurs positively assessing local (municipal) attitudes towards entrepreneurship. As demonstrated by Westlund et al. (2014) firm perception of attitudes towards entrepreneurship strongly correlates with the overall judgment of the local business climate therefore indicator based on self-reporting assessment can be successfully used as the indicator. The data for the indicator is publicly available at Federation of Swedish Enterprise.

The second type of social capital - Civil Society Social Capital aims to evaluate general level of trust among society and towards local public officials. Following methodology formulated by Putman (2007) a share of participation in local elections has been chosen as a measure of general social capital in municipalities. For the years when no election was conducted the value of indicator was estimated taking into account results from two most closest in time elections. In line with results of Scott and Storper (1995) for general economic activity and Westlund et al. (2014) for start-ups in particular one can expect positive relation between social capital and start-up propensity. The data for elections is publicly available at Statistics Sweden.
**Independent variables – industry factor**

As discussed in the theoretical part of this study, the regional industrial structure may have also impact on start-up propensity. In order to introduce it in the analysis, the Krugman specialization index has been calculated, which corresponds to the differences between the industrial structure of any given municipality and Sweden’s average industrial structure. The index can take value from zero which means industrial structure is exactly the same as on the country level up to two which means that the industrial structure is completely different from the average Swedish profile of industrial structure. Krugman specialization index was calculated by adding absolute values of differences between shares of employment of each local industry from share of employment of the same industry on the country level. This approach, focused on employment shares, is one of a few possible methods of calculating the index. When employing labour market perspective the number of employed per industry sector can be used, or alternatively, taking a business development perspective, a number of plants per industry sector can be utilized. As proved by Eriksson et al. (2013) in case of Swedish regions different methods bring comparable results.

As emphasised by Frenken et al. (2007) not only a presence of a set of complementary sectors within the region can trigger a higher growth rates on the other hand proper portfolio strategy based on non-complementary sectors is particularly important from employment perspective as it can protect a region from external demand shocks. Therefore an assumption can be made that a formation of new enterprises can be a part of spillover effects created by complementary sectors within the region. On the other hand if a demand shock appears formation of new enterprises can be a part of restructuring process in a region with properly diversified portfolio. This implies that relation between the specialization index and start-up propensity might be positive but also it might have non-linear character. To test for non-linearity, a square value of Krugman specialization index has been introduced to the model (compare Eriksson at al. 2013).

**Additional control variable**

As argued in the theoretical part of the paper, in case of countries attracting immigration such as Sweden, population of migrants can be potentially important factor that affects start-up rate. However, various theories suggest different directions of impact of immigration
population on start-up propensity. Hammarstedt (2001) shows that non-Nordic immigrants in Sweden have statistically significant higher self-employment rates than the native population. There is number of explanation of this pattern: migrants might be potentially in disadvantaged position on labour market due to lower presence of locally valued professional skills, weaker social networks or ethnical discrimination but higher self-employment might also stem from higher social capital among immigrant group or entrepreneurial traditions. To control for immigrant impact the indicator based on share of foreign born population in production age has been introduced. Due to skew variable distribution a logarithm of the value of this indicator was used.

The analysis in this study uses also share of population actively seeking for employment (Arbetssökande i konjunkturåtgärder) in the year prior to start-up establishing was calculated, because in case of necessity-driven entrepreneurs, starting up a new business can be a substitute for unemployment.

This study takes also into account the possible trade-off between public and private investments. Specifically, the share of public employed on municipal level and average salary on municipal level was calculated as accessibility of public employment and high wages can act as an entrepreneurship discouraging factors. Logarithm was introduced to deal with a skewed distribution of these variables.

In line with Westlund et al. (2014) recommendation in order to control for agglomeration effects employers’ density index (number of working population per sqkm) has been introduced. According to Westlund et al. (2014) higher population density “should mean higher access to both customers and inputs and thus facilitate entries of new firms”. Again, since the distribution of this variable is skewed, the log values are used.

In Table I all the variables used in the analysis are briefly described and the main summary statistics (mean, standard deviation, minimum and maximal variable) are provided. The number of observations is a result of introducing data on 290 Swedish for the period 2002-2012.
<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
<th>No of observations</th>
<th>Mean</th>
<th>Std. Dev.</th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Dependent variables</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>StartupRate</td>
<td>Number of start-ups created in a municipality divided by region’s working age population</td>
<td>3190</td>
<td>132,18</td>
<td>43,45</td>
<td>0,00</td>
<td>366,42</td>
</tr>
<tr>
<td><strong>Independent variables – human factor</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HumanCapital (log)</td>
<td>Human capital, Share of population with at least Bachelors degree</td>
<td>3190</td>
<td>-2,17</td>
<td>0,39</td>
<td>-3,03</td>
<td>-0,77</td>
</tr>
<tr>
<td>HumanCapital (log)²</td>
<td>Human capital, Share of population with at least Bachelors degree squared</td>
<td>3190</td>
<td>4,87</td>
<td>1,61</td>
<td>0,59</td>
<td>9,18</td>
</tr>
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<td>Business SocialCapital</td>
<td>business social capital, share of entrepreneurs positively assessing local (municipal) attitudes towards entrepreneurship</td>
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<td>43,17</td>
<td>13,70</td>
<td>5,26</td>
<td>87,00</td>
</tr>
<tr>
<td>CivilSociety SocialCapital</td>
<td>civil society social capital, share of population participating in local elections</td>
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<td>79,92</td>
<td>3,62</td>
<td>57,80</td>
<td>90,50</td>
</tr>
<tr>
<td><strong>Independent variables – industry factor</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Krug_loc</td>
<td>Krugman specialization index.</td>
<td>3190</td>
<td>0,43</td>
<td>0,17</td>
<td>0,08</td>
<td>0,98</td>
</tr>
<tr>
<td>Krug_loc_sq</td>
<td>Krugman specialization index squared</td>
<td>3190</td>
<td>0,22</td>
<td>0,17</td>
<td>0,01</td>
<td>0,96</td>
</tr>
<tr>
<td><strong>Controllers</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Foreign (log)</td>
<td>logarithm value of share of foreign born population for each municipality.</td>
<td>3190</td>
<td>-2,43</td>
<td>0,48</td>
<td>-3,82</td>
<td>-0,92</td>
</tr>
<tr>
<td>Unemployed</td>
<td>unemployment, share of population actively seeking for employment</td>
<td>3190</td>
<td>0,02</td>
<td>0,01</td>
<td>0,00</td>
<td>0,11</td>
</tr>
<tr>
<td>Public Employed</td>
<td>Share of public employed on municipal level</td>
<td>3190</td>
<td>0,34</td>
<td>0,07</td>
<td>0,15</td>
<td>0,57</td>
</tr>
<tr>
<td>Salary</td>
<td>Average salary on municipal level</td>
<td>3190</td>
<td>235334,30</td>
<td>34291,41</td>
<td>153004,10</td>
<td>425500,40</td>
</tr>
<tr>
<td>Density (log)</td>
<td>employees density, number of working population per sqkm</td>
<td>3190</td>
<td>2,38</td>
<td>1,64</td>
<td>-2,22</td>
<td>8,12</td>
</tr>
</tbody>
</table>
Table II presents correlation between variables used in the model. The correlation between human capital and two indicators of social capital is not very high (0.26 and 0.24 respectively). At much higher level there is correlation between two different indicators of social capital (0.52) which is in line with previous studies but it is still evident that those two indicators capture different aspects of social capital (Westlund et al. 2014). Also Salary and Density indicators are correlated on similar level (0.48) with each other, with Civil Society Social Capital indicator (0.5 and 0.62 respectively) and Foreign population indicator (0.56 and 0.59). This indicates that there is higher level of salaries in more urbanized areas, which are also characterised by higher level of Civil Society Social Capital and share of Foreign born population.

As the all correlations did not exceed level of 0.7 all variables were selected to be introduced in the model.
Table II Correlation between independent variables in the model.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
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<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Human Capital (log)</td>
<td>1,00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Business Social Capital</td>
<td>0,26</td>
<td>1,00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Civil Society Social Capital</td>
<td>0,24</td>
<td>0,52</td>
<td>1,00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Krug_loc</td>
<td>0,01</td>
<td>-0,03</td>
<td>-0,43</td>
<td>1,00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Foreign (log)</td>
<td>0,15</td>
<td>-0,21</td>
<td>0,29</td>
<td>0,03</td>
<td>1,00</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unemployed</td>
<td>-0,25</td>
<td>-0,24</td>
<td>-0,29</td>
<td>-0,06</td>
<td>-0,11</td>
<td>1,00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Public Employed</td>
<td>-0,23</td>
<td>0,14</td>
<td>0,28</td>
<td>-0,45</td>
<td>-0,23</td>
<td>0,18</td>
<td>1,00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Salary</td>
<td>0,21</td>
<td>0,26</td>
<td>0,50</td>
<td>0,06</td>
<td>0,56</td>
<td>0,00</td>
<td>-0,18</td>
<td>1,00</td>
<td></td>
</tr>
<tr>
<td>Density (log)</td>
<td>0,29</td>
<td>0,23</td>
<td>0,62</td>
<td>-0,21</td>
<td>0,59</td>
<td>-0,39</td>
<td>-0,16</td>
<td>0,48</td>
<td>1,00</td>
</tr>
</tbody>
</table>
Ethical considerations

As all used data sources operate on aggregate level with the lowest unit of aggregation on municipality level are publicly available and were inspected before publishing by reliable Swedish institutions such as Statistic Sweden the project poses no threat of revealing any personal, sensitive or confidential data.

Results

Country level model

In the first step of analysis independent variables covering human factor were introduced: human capital: HumanCapital(log), HumanCapital (log)2 and social capital: Business Social Capital and Civil Society Social Capital and additionally one control variable for population density Density (log). In the second step controlling variables for share of foreign born - Foreign (log), population unemployment – Unemployed, share of public sector employment - Public Employed and average salary level - Salary were introduced. In the third step independent variables representing industry factor were introduced. The results of the process are presented on Table III.

Multilevel models are estimated with maximum likelihood method, and not with ordinary east squares method, therefore a standard measure of model fit, i.e. R2 cannot be examined. However, for models estimated with maximum likelihood method alternative measures of model fit have been developed. The AIC and the BIC\(^1\) are two popular measures for comparing maximum likelihood models.\(^2\) AIC and BIC are defined as:

\[
\text{AIC} = -2\ln(\text{likelihood}) + 2k
\]
\[
\text{BIC} = -2\ln(\text{likelihood}) + \ln(N)k
\]

where

- \(k\) = number of parameters estimated
- \(N\) = number of observations

Unlike R2, AIC and BIC are not measured on scale 0-1 therefore they can be interpreted only when comparing different models in order to select the optimal specification. In such case lower value of the measures indicate better specification. The advantage of these measures is

\(^1\) Each of the measures has own set of disadvantages therefore it is worth to take both into account when comparing specifications. AIC uses in contrast to BIC the constant 2 to weight \(k\), whereas BIC uses \(\ln(N)\). The use of value of \(N\) is disputable as \(N\) does not appear in the likelihood function itself and is not the output of a standard statistical formula therefore determining what is an observation is often subjective.

\(^2\) However Stata software does not calculates those measures while computing the models.
that they both have penalties for including variables that do not significantly improve the model fit. Therefore particularly with large samples, these measures can suggest more parsimonious but adequate models (Akaike 1974, Schwarz 1978, Raftery 1995).

As presented in Table III despite aforementioned penalties each step introducing additional set of variables into the model had positive impact on the model quality. Therefore model 3 was selected for results interpretation.
Table III results for stepwise procedure for country level model

<table>
<thead>
<tr>
<th></th>
<th>(1) Human factor</th>
<th>(2) Human factor plus controllers</th>
<th>(3) All variables</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>b</td>
<td>se</td>
<td>b</td>
</tr>
<tr>
<td>StartUp</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Business SocialCapital</td>
<td>0.17***</td>
<td>(0.05)</td>
<td>0.11**</td>
</tr>
<tr>
<td>Civil Society SocialCapital</td>
<td>2.18***</td>
<td>(0.42)</td>
<td>2.55***</td>
</tr>
<tr>
<td>Human Capital (log)</td>
<td>34.13*</td>
<td>(20.10)</td>
<td>95.18***</td>
</tr>
<tr>
<td>Human Capital (log)2</td>
<td>-18.82***</td>
<td>(4.18)</td>
<td>-4.23</td>
</tr>
<tr>
<td>Density (log)</td>
<td>-27.79***</td>
<td>(1.76)</td>
<td>-34.67***</td>
</tr>
<tr>
<td>Foreign (log)</td>
<td>40.36***</td>
<td>(3.71)</td>
<td>36.57***</td>
</tr>
<tr>
<td>Unemployed</td>
<td>38.28</td>
<td>(40.95)</td>
<td>75.08*</td>
</tr>
<tr>
<td>Public Employed</td>
<td>-237.30***</td>
<td>(19.83)</td>
<td>-217.47***</td>
</tr>
<tr>
<td>Salary</td>
<td>-0.00***</td>
<td>(0.00)</td>
<td>-0.00***</td>
</tr>
<tr>
<td>Krug_loc</td>
<td>96.49***</td>
<td>(21.29)</td>
<td></td>
</tr>
<tr>
<td>Krug_loc_sq</td>
<td></td>
<td>-74.66***</td>
<td>(21.27)</td>
</tr>
<tr>
<td>_cons</td>
<td>182.44***</td>
<td>(51.61)</td>
<td>449.53***</td>
</tr>
<tr>
<td>Between-region st. dev.</td>
<td>2.58***</td>
<td>(0.34)</td>
<td>2.24***</td>
</tr>
<tr>
<td>Between-municipality St. dev.</td>
<td>3.62***</td>
<td>(0.05)</td>
<td>3.48***</td>
</tr>
<tr>
<td>_ Between-years St. dev</td>
<td>2.98***</td>
<td>(0.01)</td>
<td>2.95***</td>
</tr>
<tr>
<td>ll</td>
<td>-14578.23</td>
<td></td>
<td>-14444.5</td>
</tr>
<tr>
<td>N</td>
<td>3190</td>
<td></td>
<td>3190</td>
</tr>
<tr>
<td>N municipal</td>
<td>290</td>
<td></td>
<td>290</td>
</tr>
<tr>
<td>N FA-region</td>
<td>72</td>
<td></td>
<td>72</td>
</tr>
<tr>
<td>AIC</td>
<td>29174.46</td>
<td></td>
<td>28915</td>
</tr>
<tr>
<td>BIC</td>
<td>29229.07</td>
<td></td>
<td>28993.88</td>
</tr>
</tbody>
</table>

*p<0.10, **p<0.05, ***p<0.01
All human factor variables: human capital, civil society and business social capital turned out to be significant in the model when controlling for year and region and the signs of all coefficients are in line with theoretical predictions (compare Putman (2007), Westlund and Bolton (2003), Eriksson et al. (2014). The results of the model suggest that within this group of factors, the most important is human capital followed by social trust and positive attitude towards entrepreneurs. The last two have far weaker impact on start-up propensity. Interestingly, theoretical assumption based on Block et. al. (2013) and Van der Sluis et al. (2008) about nonlinear relation between human capital and entrepreneurship was not confirmed by the model. There is no proof that individuals disadvantaged from human capital perspective form a significant group of necessity-driven entrepreneurs.

Nevertheless, analysis of controlling variables confirms the existence of necessity-driven entrepreneurs: in line with the earlier research of Acs (2006), Hammarstedt (2001) and Ohlsson et al (2012) rate of unemployment and share of foreign born population have positive impact on number of start-ups. In case of unemployment this directly supports the thesis that starting an enterprise can be a substitute for employment. On the one hand such results can support the thesis about lower presence of locally valued professional skills or ethничal discrimination of migrants and that not all immigrants to Sweden have the same career opportunities as the native Swedes. On the other hand this result can be interpreted as indicator of positive entrepreneurial characteristic of migrants compared to natives. Finally in line with Florida’s approach this can support the thesis about positive impact of ethnic diversity on overall regional economic performance.

Analysis of other controlling variables confirms that large public sector and high level of wages decrease entrepreneurship. Interestingly there is also negative relation between population density and start-up propensity in the model. One should remember however that in this model the advantages of urban areas are already taken away represented by other factors such as human capital. Additionally the model specification controls for regional (FA-region) characteristics. Therefore lower density areas defined as number of employed per squared kilometres might suggest also lower office rates which can be important factor for newly established enterprises. In such case proximity to the market maybe not as important as other such as land costs for example.

I present raw coefficients instead of standardised ones, since they have a direct interpretation how much start-up rate will increase taking into account increase of certain independent variable, which can be more useful for presenting the results. Standardized coefficients would indicate in turn by how many standard deviations the dependent variable changes as a result as a unit increase in explanatory variable.
Analysis of Krugman Index reveals expected reversed u-relation between specialization and start-ups propensity. This supports the thesis that a moderately specialized economy can expect higher start-up rates that highly or non-specialized.

Regional models

In order to analyse regional differences in start-up propensities regional division methodology developed by Agency for Growth Policy Analysis (Myndigheten för tillväxtpolitiska utvärderingar och analyser) was utilized in this paper. The division is based on functional analysis region level (FA-regions) and each of FA-regions is considered to belong to one of six categories: 4 (for full specification see Tillväxtanalys 2013). Map II in the Appendix presents respective spatial division. For each regional category a model with the same variables as model 3 is estimated. The summary of variables was presented in Table IV. Analysis of results of regional models reveals that each region type have set of characteristics different then country level.

Metropolitan areas are characterised by higher than national level impact of human factor variables. Higher values of significant coefficients for human capital, social trust and positive attitude towards entrepreneurs indicate that those factors matter more than on country level. Additionally significant positive coefficient for squared value of human capital indicates asymmetric character of entrepreneurs in those areas. Start-ups are established more often by persons with the highest and the lowest human capital. Among controlling variables unemployment rate and level of wages do not influence significantly start-up propensity. What is more important, in the region-specific analysis, sector specialization does not influence start-up propensity.

For the other types of the regions human factor variables play far less important role than for metropolitan areas and for the country level. In none other type of the region all three variables are significant simultaneously At the same time all controlling variables with the exception of unemployment remain significant for different regional settings and keep the same direction as in the country model. Also impact of Krugman Index variables remains similar through different types of regions with the exception of densely populated remote

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4 which are the following: 1. Metropolitan regions (Storstadsregioner), 2. Densely populated regions - near a city (Tätaregioner - nära en stad), 3. Densely populated regions - remote (Tätaregioner - avlägsna belägen), 4. Rural Regions - near a city (Landsbygdsregioner - nära en stad), 5. Rural Regions – remote (Landsbygdsregioner - avlägsna belägen), 6. Rural Regions - very remote (Landsbygdsregioner - mycket avlägsna belägen)
regions where the reversed u-relation between the specialization index and start-up propensity turns into linear one (not significant squared value of Krugmann’s index).

All this factors might indicate the dual character of entrepreneurship patterns in Sweden. The metropolitan areas of Sweden entered fully post-industrial period which means that the importance of service sector is growing and results in raising number of microenterprises. The large number of branches provides lots of opportunities and those areas are fully independent from previous industrial structure. Higher start-up propensity among persons with the lowest and the highest human capital might indicate the dual character of modern services in metropolitan areas. Growing sector of advanced services requiring high level of human capital is accompanied by also growing sector of low-paid service jobs (Florida 2002). This explanation is in line with already mentioned OECD (2011) findings that the income from self-employment was one of main drivers of the widening income gap in Sweden. Compared to in metropolitan regions, entrepreneurial activity in other regions of the country is to large extent a result of current economic conditions and industrial settings.
<table>
<thead>
<tr>
<th></th>
<th>(4) Metropolitan regions</th>
<th>(5) Densely populated regions - near a city</th>
<th>(6) Densely populated regions - remote</th>
<th>(7) Rural Regions - near a city</th>
<th>(8) Rural Regions – remote</th>
<th>(9) Rural Regions - very remote</th>
</tr>
</thead>
<tbody>
<tr>
<td>StartUp</td>
<td>b (0.08)</td>
<td>b (0.07)</td>
<td>b (0.12)</td>
<td>-0.03 (0.13)</td>
<td>0.02 (0.16)</td>
<td>0.09 (0.36)</td>
</tr>
<tr>
<td>Civil Society Social Capital</td>
<td>5.83*** (0.87)</td>
<td>3.34*** (0.78)</td>
<td>1.06 (1.00)</td>
<td>-0.30 (1.64)</td>
<td>1.59 (1.12)</td>
<td>4.39 (3.09)</td>
</tr>
<tr>
<td>Human Capital (log)</td>
<td>105.70*** (31.64)</td>
<td>4.72 (37.01)</td>
<td>159.19* (86.69)</td>
<td>118.10* (71.20)</td>
<td>123.50 (122.96)</td>
<td>1003.26** (412.88)</td>
</tr>
<tr>
<td>Human Capital (log)²</td>
<td>16.52** (6.58)</td>
<td>-20.64*** (7.70)</td>
<td>9.99 (17.33)</td>
<td>-10.39 (13.98)</td>
<td>-12.08 (23.32)</td>
<td>135.48* (78.29)</td>
</tr>
<tr>
<td>Density (log)</td>
<td>-14.59*** (3.51)</td>
<td>-39.29*** (2.77)</td>
<td>-22.71*** (3.46)</td>
<td>-43.04*** (5.24)</td>
<td>-41.79*** (7.94)</td>
<td>-0.66 (18.73)</td>
</tr>
<tr>
<td>Foreign (log)</td>
<td>41.14*** (9.69)</td>
<td>37.38*** (5.84)</td>
<td>24.11** (10.14)</td>
<td>41.62*** (11.63)</td>
<td>46.47*** (11.39)</td>
<td>-7.05 (18.05)</td>
</tr>
<tr>
<td>Unemployed</td>
<td>142.72 (106.78)</td>
<td>98.08 (67.57)</td>
<td>141.48 (106.38)</td>
<td>-31.03 (114.38)</td>
<td>125.67 (126.49)</td>
<td>299.10 (207.17)</td>
</tr>
<tr>
<td>Public Employment Salary</td>
<td>-66.13** (31.56)</td>
<td>-214.24*** (29.12)</td>
<td>-113.53** (51.66)</td>
<td>-295.90*** (72.28)</td>
<td>-259.28*** (85.69)</td>
<td>-429.65*** (134.54)</td>
</tr>
<tr>
<td>Krug_loc</td>
<td>-25.25 (40.50)</td>
<td>98.7*** (29.40)</td>
<td>131.40** (55.26)</td>
<td>167.20** (72.03)</td>
<td>128.84** (78.25)</td>
<td>266.18 (198.67)</td>
</tr>
<tr>
<td>Krug_loc_sq</td>
<td>29.96 (45.24)</td>
<td>-82.48*** (28.62)</td>
<td>-52.95 (58.49)</td>
<td>-132.45*** (63.04)</td>
<td>-135.94* (79.05)</td>
<td>-395.43* (213.18)</td>
</tr>
<tr>
<td>_cons</td>
<td>-26.61 (103.78)</td>
<td>235.60*** (83.20)</td>
<td>473.17*** (153.53)</td>
<td>797.59*** (172.55)</td>
<td>712.54*** (210.53)</td>
<td>1772.98*** (630.11)</td>
</tr>
<tr>
<td>Between-regionstd.dev.</td>
<td>2.14*** (0.68)</td>
<td>2.53*** (0.25)</td>
<td>-11.14 (0.00)</td>
<td>-17.49 (0.00)</td>
<td>2.82*** (0.62)</td>
<td>3.46 (13.81)</td>
</tr>
<tr>
<td>Between-municipality Std.dev.</td>
<td>3.51*** (0.09)</td>
<td>2.93*** (0.09)</td>
<td>2.85*** (0.17)</td>
<td>3.46*** (0.14)</td>
<td>3.37*** (0.24)</td>
<td>3.46 (13.81)</td>
</tr>
<tr>
<td>Between-years St.dev</td>
<td>2.77*** (0.02)</td>
<td>2.89*** (0.02)</td>
<td>2.86*** (0.04)</td>
<td>2.94*** (0.04)</td>
<td>3.02*** (0.04)</td>
<td>3.36*** (0.07)</td>
</tr>
<tr>
<td>N</td>
<td>923</td>
<td>1100</td>
<td>308</td>
<td>385</td>
<td>330</td>
<td>143</td>
</tr>
<tr>
<td>N municipal</td>
<td>84</td>
<td>100</td>
<td>28</td>
<td>35</td>
<td>30</td>
<td>13</td>
</tr>
<tr>
<td>N FA-region</td>
<td>3</td>
<td>18</td>
<td>11</td>
<td>8</td>
<td>19</td>
<td>13</td>
</tr>
</tbody>
</table>

* p<0.10, ** p<0.05, *** p<0.01
Discussion and summary

The aim of this study was to investigate the role of human and social capital in start-up creation process. Specifically it reveals the types of interaction between “soft” factors and institutional characteristics of the regions and investigates to what extent does the role of human and social capital varies in different institutional settings.

The model results revealed important facts about start up creation processes, namely dual characteristic of entrepreneurship patterns in Sweden. In the metropolitan regions of the country human and social capital play much more important role than in the other regions, where the entrepreneurial activity is to large extent a result of current economic conditions and industrial settings.

The results confirmed also the existence of necessity-driven entrepreneurs which shows that for certain disadvantaged groups in Sweden self-employment is a substitute for regular employment. According to Amorós and Bosma (2013), Swedish population has the most positive perception of opportunities for start-ups among EU countries (64.4% compared to 28.7% EU average), but at the same time one of the lowest share of entrepreneurial intentions (9.5% compared to 13.5%), which may suggest that self-employment however economically sustainable is related to overall lower well-being than regular employment.

Therefore it can be assumed that some share of entrepreneurs particularly self-employed persons can be in socially disadvantaged positions and requires special attention from policy making point of view. It raise also a question to what extend support for entrepreneurial activities can be used in Swedish context as a tool for fighting poverty and unemployment. As stressed by Fölster (2000) there is significant support for the notion that increased self-employment has a positive effect on employment but there is also concern if artificially created by public programs self-employment has the same characteristics, and the same employment effects as regular one.

It is worth to underline that the role of start-ups in national economy cannot be analysed only from economic perspective. The formation of new companies is interestingly related also to political and moral/ethical dilemmas. Financial situation of successful funders might change drastically compared to those who did not succeed but also compared to those who did not try. In every economic system allowing for market-related activities the cost and risk of funding start-up remain mainly private while the revenues are always to some extend public due to taxation and other social contributions.
In political dimension this dilemma is presented by market or social orientation of political parties. The main arguments for lassie-faire approach is that the wealth created by the most successful individuals at the end works for the common good (Roper and Cheney 2005). On the other hand social approach stress the need to utilize private resources for common good directly through welfare–workfare mix i.e. through investing tax payers resources in publicly available education (Torfing 1999).

While in political dimension the most popular question is what can serve best needs of a community for a long run in ethical dimension the question is to what extend inequalities among citizens can be accepted. This makes enterprise creation not only economic but also sociological phenomenon and additionally draw attention toward social aspects of entrepreneurship.

Sweden is a country with quite high tax rates (PWC 2014) and very low Gini coefficient (World Bank 2013b) which can be interpreted as political opt for redistribution and ethical opt for equality. Taking this into account the lowest share of entrepreneurial intentions does surprise at all. Any to be entrepreneur in Sweden must expect his or her potential profits to be redistributed to larger extent than in many other countries but might also expect higher than in many other countries redistribution of profits of others for common good.

The usual policy for encouraging entrepreneurship tend to cover either incentives lowering private investments in start-up or lowering the level of distribution of resources won due to economic activity. This kinds of incentives can be considered against Swedish model, but the fact that higher rates of entrepreneurship can be achieved due to investment in human and social capital are fully in line with Swedish policy and it makes the Swedish example very interesting from policy perspective.

This study does not capture two important aspects which could be a topic for the future research. First of all, it would be of merit to use microdata which were not available for this research project to analyse the performance of start-ups in terms of job creation, productivity and innovation. This could provide additional important information as it is not only important how many new companies are established but also how they perform and what are regional and human factors influencing this performance. Secondly a vital question for investigation is if the regional role of human factors in start-ups propensity is currently changing and it what direction.
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Appendix
Map II