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Entrepreneurial Social Capital and Economic growth.

An analysis of local entrepreneurial social capital and job creation in Sweden

Table of Contents

Abstract

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This paper makes an attempt to measure the degree of entrepreneurial social capital within the municipalities in Sweden and connect this to the creation of new jobs in new firms. A linear regression model (OLS) is first tested for all municipalities, and two restricted samples for rural and urban municipalities. The results show that entrepreneurial social capital has a negative effect on the creation of new jobs, captured within the rural municipalities. As for the urban municipalities, the results are not statistically robust but they indicate a positive relationship. The findings are both supporting and contradicting former research, they support that social capital has a stronger influence in rural areas but the relationship is negative.

Keywords: Entrepreneurship, social capital, new jobs, economic growth.

1   Introduction

What factors promote economic growth? Scholars and politicians have asked themselves this question for centuries and continue to do so today. Several models have been constructed with various success to explain the elements that contribute to economic growth but there is still no clearcut answer on the most important factors. The most famous models are perhaps the Solow growth model and Romers endogenous growth model. Solows original model from 1956 contains three important factors for growth – technology, physical capital and labor. Romers model from 1986 adds human capital to the other three factors. Since Romers addition of human capital, scholars have opened their eyes for yet another factor behind economic growth, namely social capital.

The concept of social capital was introduced in the 19th century and have been used by famous persons like Marx (1894/2014) and the economist Marshall (1920). To recognize social capital as a factor behind economic growth is though more recent and can be traced back to Coleman (1988). Since then have, among others, Putnam (1995) shown that regions with higher levels of social capital in Italy also enjoy higher levels of regional GDP and Glaeser (2002) connected individual economic outcomes to the level of individual social capital. The definition of social capital that will be used in this paper is the one stated by Coleman (1988); social capital is "a variety of different entities with two elements in common: they all consists of some aspect of social structures and they facilitate certain actions of actors – wheter persons or corporate actors – within the structure ". Based on Coleman´s definition, social capital exists in the social structures in society, examples of these structures might be the relationship between two individuals or a network of people inside an organization. Further, Coleman claims it is applicable not only on persons but also on corporate actors or entrepreneurs. A claim which brings us to the topic of this paper.

This paper will investigate the level of entrepreneurial social capital in the municipalities in Sweden and try to connect the results to the level of economic growth. The level of economic growth will be measured as numbers of new jobs created by new firms. Therefore the purpose of this paper is to investigate the connection between the level of entrepreneurial social capital and the creation of new jobs by new firms in the municipalities in Sweden by answering the following research question: *Does a higher level of entrepreneurial social capital in a municipality lead to that more new jobs are created by new firms?*

The choice to use the level of entrepreneurial social capital is highly influenced by Westlund et al. (2014). They found in their paper a positive relationship between the level of entrepreneurial social capital and number of start-ups of firms in the Swedish municipalities. This paper will continue the research that Westlund et al. (2014) started and investigate if the same connection can be found for the creation of new jobs by new firms. This field of research is vitally important because it might help explaining why some regions show higher levels of economic prosperity than others and the reasons behind these relations.

New jobs are mainly created by entrepreneurs who run an established firm or start a new one. In Sweden 67.6 percent of the employees were working in the private sector by the end of 2015 (Statistics Sweden, 2016). In other words, 67.6 percent of the Swedish labor force is working in firms created by entrepreneurs. This fact gives further validity to the importance of research within this topic. Moreover, research conducted in the USA shows the importance of entrepreneurship for regional economic growth in

general and the creation of new jobs in particular (Acs and Armington, 2004). These results give further weight and relevance to the significance of this paper.

The analysis will be based on a cross sectional dataset covering all Swedish municipalities in the years 2011, 2012 and 2013 for the dependent variable and 2009 and 2010 for the independent variable. In total five regressions will be estimated, two for all municipalities, one for rural municipalities and two for urban municipalities. An original model is used on all three samples of municipalities, plus two somewhat different models for the urban sample and "all" sample. The aim is to see if there is a positive statistically significant relationship between the dependent variable – new jobs created by new firms per capita – and the independent variable – entrepreneurial social capital. However, there are as mentioned earlier many factors that contribute to economic growth. Therefore four control variables are included in the original regression model as well. Namely, human capital, regional GDP, population and labor force participation. The aim with these control variables is to isolate the effect that entrepreneurial social capital has on the creation of new jobs. A closer description of the variables included in the regression model and the two alternative models will come in the section about data and method.

The outline of the rest of the paper is as follows: Section 2 will further explain the concept of social capital and summarize former empirical research made about social capital in an economical context. Section 3 provides the theoretical framework on which this paper is based on and provides further evidence from former research in support of the theory presented. Section 4 presents the data and methods used and section 5 presents and analyses the empirical findings. The paper ends with a short conclusion covering the most important parts of the paper.

2   What is social capital?

Coleman (1988) was one of the first to introduce and illustrate the concept of social capital in an economical context. In his paper he focuses on three different forms of social capital. Namely, obligations and expectations, information channels and social norms. Obligations and expectations consists of favors and the expectation from an agent who has rendered another agent a service to get a favor in return when needed. Important in this form of social capital is trust between the actors that services are returned when they are needed and asked for.
Information channels consists of the idea that if an agent wants or needs information, the agent can use its social relations to get this information fast and without much effort. The idea behind norms and effective sanctions is that norms control how people behave in a society. To enforce norms, effective sanctions are also needed. The most common example is that of crime. In a society with consistent norms about criminal acts and effective sanctions to prevent them, people can walk outside late at night without being afraid. The most effective norms are the ones that benefit the collective and promote actions among individuals towards the common good but deter action agreed to be criminal.

However, at the first stage Coleman starts with a theory in which agents possess different resources and social capital is one of these resources. Further, agents use the resources they have available rationally to gain benefits. Coleman separates social

capital from other forms of capital by stating that social capital exists in the relations between and among actors. It is difficult to measure and even to actually see the impact of social capital in society. Despite this Coleman claims that social capital is a very important factor of production. Consider a group of people who share the same norms and trust each other, this group is probably more productive than a comparable group that do not share the same norms and trust.

Another important concept regarding social capital is that of networks. According to Coleman, social capital works best in social networks with closure. The theory behind this is that when there is closure in a social network, all agents have ties to each other. If so, all agents have an incentive to comply with the norms the network share and information is more easily delivered. However, not all scholars focus on networks as a carrier of social capital.

Glaeser et al. (2002) use a more individualistic approach to the concept of social capital. They analyze the individuals investment decision into social capital. Individual social capital is defined as "a person`s social characteristics – including social skills, charisma and the size of his Rolodex which enables him to reap market and non-market returns from interaction with others". Further, according to their theoretical framework, some of the social capital a person possess were given at birth i.e. abilities such as being charismatic or extrovert. However, they also assume that individuals can invest in these abilities and by doing so gain a larger stock of social capital.

Glaeser et al. (2002) also discuss externalities that may come from individual social capital. Examples of these externalities might be membership in an organization which gives the network of the organization a positive externality. Another example is status which may impose a negative externality on the surrounding individuals, when status is a zero-sum game.

A discussion about entrepreneurial social capital and what it is might be fruitful to develop at this point. Westlund and Adam (2010) conclude that future research regarding social capital need to develop new measures of social capital connected to creativity, tolerance, entrepreneurship and sharing of knowledge.

Westlund et al. (2014) develop and measure a variable called entrepreneurial social capital for the municipalities in Sweden and connect this to municipality start-up rates of firms. They find that entrepreneurial social capital do influence the creation of new firms at the local level. The study divides the Swedish municipalities in rural and urban ones to see if there is a difference in the impact of entrepreneurial social capital for these two types of municipalities. Here, they find that entrepreneurial social capital has a stronger influence on the start-up rates in the rural municipalities. Further, they use a survey from Svenskt Näringsliv to measure the degree of entrepreneurial social capital, this method will also be used in this paper.

According to Westlund and Adam (2010) and Westlund et al. (2014) former research on social capital and entrepreneurship have mainly used firm level variables of social capital. Meaning that the variables used are more of an estimator of the entrepreneurial social capital within the selected firms rather than an estimator of the level of social capital within the entrepreneurial environment in a region. Due to this problem and the survey Svenskt Näringsliv provided, Westlund et al. (2014) developed more general variables of entrepreneurial social capital. Mainly because of the large number of firms included in the survey for each municipality which gives a good approximation of the entrepreneurial social capital level. In this paper, the meaning of entrepreneurial social

capital is how well the local business environment functions in a social context. Everything which makes a firm socialize in one way or another will be incorporated. Some examples: trust among firms, business networks and support from public authorities. All these potential social connections shape the business environment in a region and create the entrepreneurial social capital which this paper uses.

3   Theoretical framework

3.1 Social capital and economic growth

The possibilities to produce goods and services depend on a variety of factors. Labor is important. The possibilities of production depend on the number of workers available, how many hours they work and the skills and knowledge the workers have. The skills and knowledge that the labor force possess is called human capital. Human capital is accumulated by education or work experience. Human capital is defined as: "People`s innate abilities and talents plus their knowledge, skills and experience that make them economically productive" (Worldbank, 2016). A labor force that have accumulated more human capital is also more productive. Another input crucial for production is physical capital – machines, buildings and other forms of equipment used in the production process (Worldbank, 2016). For a given point in time the stock of physical capital is stable. However, over a longer period investment in new equipment increases the stock and depreciation decreases it. New investments are therefore constantly needed to maintain the current level of physical capital in the future. Land is another factor that may limit production, basically all forms of production need some land to operate. Since land is fixed it limits the possibilities of production. The level of technology also affects the production possibilities, higher levels of technology give higher production levels. Mainly because other input factors may be used more efficiently, more effective machines due to technology give a higher production level at the same input of labor (Gottfries, 2013). Considering the Cobb-Douglas production function:

$$Y = AK^\beta L^\alpha$$

Where Y= total production, A= total factor productivity, K= physical capital, L= labor and β and α are output elasticities.

Important for this paper is A which consists of other inputs than physical capital and labor. Technology is one factor that contributes to growth which is considered to be captured in A and human capital another. By leaning on former research and the empirical findings of these pioneers in the field of social capital and economic growth, this paper will consider social capital as a factor that contributes to production. In the simple Cobb-Douglas model above, social capital is incorporated inside A together with technology and human capital. In the following sections, evidence from former research regarding the impact of social capital on economic growth will be presented.

Putnam (1995) investigates the relationship between social capital and economic growth in Italian regions. In his paper Putnam uses three different measures of social capital, an index of civic engagement, an index of the effectiveness of regional government and a

survey of citizen satisfaction with the regional government. Putnam finds that regions with more social capital have higher income levels and/or converge faster towards higher income levels, measured as GDP per capita.

Knack and Keefer (1997) use the World values survey to make a cross country analysis of how social capital in the form of trust and civic cooperation effect economic performance. They find a strong positive significant relationship between both variables of social capital and economic growth measured as per capita income in their sample of 29 countries. However, when they test if associational activities are related to economic performance they do not find any evidence for this. They also look at the structure of the societies in which trust and civic cooperation is strong. Here they find that more equal societies with low degrees of social stratification enjoy higher levels of these measures. They also find that trust and civic cooperation are stronger in countries where institutions work more effectively and property rights and contracts are enforced in an orderly manner.

Neira et al. (2009) use trust and group membership as social capital indicators and conclude that social capital indeed enhance economic growth. Their research is based on EU countries and they use GDP per capita as economic growth variable. Further, they conclude that social capital like other forms of capital depreciates and thereby trust and memberships need investment in order to be maintained or increased. They also discuss the negative aspects of social capital and conclude that in some moments and situations social capital have negative impacts. Just think of the different kinds of social capital that existed in Germany during the 1930s and 1940s. Finally the authors claim that social capital should be incorporated into the production function in the future, since social capital actually affect the economy. To summarize the findings of former empirical research on the subject of social capital and economic growth it is obvious that the researchers in the field have found proof of the impact of social capital. Further, they argue for the incorporation of social capital into the production function, something that this paper have shown an example of above.
The theoretical framework behind this position is that just as physical capital with its machines and tools or human capital with its knowledge and skills are required to produce economical growth so are social relationships between people and extensive networks that facilitate trust and sharing of information also an essential aspect. Countries, regions or communities that have a larger stock of social capital should thereby enjoy better economical outcomes. In areas with a higher stock of social capital, the business sector should be able to operate easier with less frictions. Social connections between firms and the network that these connections create should enhance growth through various channels. First, it should enforce a good business climate where contracts and property rights are respected. Second, the network of firms create a good business environment in which business agreements between firms are easier to conduct. Third, matching of both business and employees should be more efficient and thereby enhance economic growth. All of these channels probably also influence the number of new jobs created in a community. Important to note here is that in this paper new jobs created by new firms are used as a proxy for economic growth. In the next section a discussion of how social capital may lead to more new jobs is made.

3.2 Entrepreneurial social capital in the creation of new jobs

Acs and Armington (2004) investigate the relationship between entrepreneurial activity and economic growth in 394 local economic regions in the USA. As a measure of growth they use employment growth and entrepreneurial activity is measured by number of new firms with less than 500 employees. The authors find a strong positive connection between the two variables. Further, Acs and Armington use a theoretical framework in their paper based on externalities, where the main idea is that knowledge externalities is the reason to the difference in growth among the USA regions. Here, entrepreneurial activity can be seen as the distributor of these knowledge externalities that facilitate growth.

Saxenian (1996;1996) studies the high-technology regions of Silicon Valley and Route 128 with the aim to find the answer to why Silicon Valley firms since the 1980:s crisis recovered much faster. According to Saxenian the answer lies within how these two regions have organized their business environments. Firms in Silicon Valley enjoy high levels of information sharing and benefit from a very inclusive social network environment. The labor market is very open and employees flow between firms sharing knowledge and technical progress. However, along Route 128 where the industry type is exactly the same as in Silicon Valley the business environment is more rigid. Firms do not share information and the social networks between firms are limited to close suppliers and clients. Saxenian calls this system firm-based in relation to Silicon Valley's network based system (Saxenian, 1996;1996). Here, it is quite obvious that social capital in the Silicon Valley region has given its entrepreneurs a competitive advantage compared to their Route 128 competitors. In 1975 both regions had roughly the same number of employees within the high-technology sector. In 1990, Silicon Valley had 250 000 employees versus Route 128s 150 000 (Saxenian, 1996). Given these facts, it seems as if the network based system also create more new jobs. A fact which gives further relevance for developing and testing theories of how social capital in an entrepreneurial context promotes growth.

The next section will cover the theoretical framework of how entrepreneurial social capital and externalities such as knowledge and information sharing might lead to the creation of more new jobs.

New jobs are created by entrepreneurs that start new businesses or expand their current business. Thereby, when investigating the impact of social capital on new job creation, entrepreneurial social capital is the best indicator. In studies about entrepreneurship and economic growth scholars have started to focus on knowledge externalities as the main contributor to new firms and economic growth (Acs and Armington, 2004; Audretsch, Keilbach and Lehmann, 2006; Acs and Audretsch, 2006). The theory behind this position is that growth is generated by innovation, new knowledge and entrepreneurs who reap the benefits from the first two. Innovation and new knowledge is considered to be a result of research in already existing firms which have the skills and resources available to conduct this form of expensive research. New knowledge and innovations emerging from research might be used in the original firm or for some reason considered non-profitable and not used. Now the entrepreneur enters the theory, someone takes advantage of the new knowledge or innovation that the original firm has thrown away. This someone might be an engineer employed by the original firm or an outsider who has access to information inside the original firm. The entrepreneur sees the new knowledge developed by the original firm as a business opportunity and starts a

new firm with the aim to commercialize this new knowledge (Audretsch, Keilbach and Lehmann, 2006). As the reader probably has understood knowledge is the essential part of this theory about entrepreneurship and economic growth. Knowledge is though not uniformly distributed to everyone, mainly because of asymmetric information (Acs and Armington, 2004). Here, it is possible to connect the theory of social capital to that of knowledge externalities. Remember Coleman`s (1988) concept of information channels, one of the forms that social capital can take. This concept would imply that social capital is highly involved in the distribution of knowledge externalities. This reasoning can be developed to include a whole region and its level of entrepreneurial social capital. The conclusion gives that in regions with a higher level of entrepreneurial social capital, knowledge externalities are distributed more easily thus leading to the creation of more new firms and a higher economic growth in the form of more new jobs.

To summarize the theoretical framework on which this paper is based: Entrepreneurial social capital is probable to contribute to new job creation in new firms and thereby enhance economic growth. The main reason for this claim is that entrepreneurial social capital enhances the distribution of knowledge externalities between agents in the entrepreneurial sector.

4   Data and Method

4.1 Variables

The dependent variable which will be estimated is new jobs created by new firms. By using this variable it is possible to conduct the empirical analysis on jobs that it is known that entrepreneurs have created. Jobs created by the public sector are not included which is beneficial for the analysis. One disadvantage is that jobs created by already existing firms are not included. The data is downloaded from Statistics Sweden (2016) and transformed to per capita numbers by the author. Data are gathered for the years 2011-2013 and the sum of new jobs created in new companies during these years will be used.

Data on the independent variable entrepreneurial social capital is gathered from the Swedish Confederation of Enterprise (Svenskt Näringsliv). It consists of a yearly survey where company leaders are asked to evaluate the local entrepreneurial environment. The survey includes all municipalities in Sweden. How many participants that are included in each municipality depends on population and number of firms. In municipalities with less than 10 000 inhabitants and less than 350 registered firms, 150 surveys are sent out. In municipalities with less than 50 000 inhabitants and less than 1200 firms, 200 surveys are sent out. In municipalities with more than 50 000 inhabitants or more than 1200 registered firms, 400 surveys are sent out. The three large cities in Sweden are treated differently. Göteborg and Malmö are given 600 surveys and Stockholm 1200. In total there are twenty questions in the survey (Företagsklimat, 2016). In this paper the answers to the following question will be used to estimate the level of entrepreneurial social capital: *What is your overall opinion about the business climate in the municipality*? Company leaders were asked to rank the business climate from 1-5 where 5 means a very good business climate and 1 means a bad business climate. The data are gathered for the years 2009 and 2010. The measure used in the analysis is the mean for

these two years. Important to notice is that the variable estimated is not a pure measure of entrepreneurial social capital. Rather it is based on the assumption that the responders take the social context of business climate into consideration. It is probable that other things such as competition, firm density or even geography might influence the answer to the question used. The main argument to still use this method of measuring entrepreneurial social capital is that Westlund et al. (2014) used a similar method and found significant results and that there are no other existing way to easily measure it. Unfortunately that is the problem with research regarding social capital and especially entrepreneurial social capital which is a rather new field of research.

4.2 Control variables

Human capital level in the municipalities are downloaded from Statistics Sweden (2016). The level will be measured by the fraction of population with 3 years or more of higher education. The variable are transformed to per capita level by the author. It is included in the model to investigate if a municipality with a more educated population create more new jobs. Data is gathered for the years 2009-2010 and the mean for these years' human capital level will be used.

Regional GDP level in million Swedish kronor are gathered from Statistics Sweden (2016), it is included to investigate if municipalities with a higher level of regional GDP create more new jobs. Data is gathered for the years 2009-2010 and the mean for these years are used in the analysis. Further, the variable is computed into per capita by the author of the paper using the total population of each municipality to divide with.

Population numbers of the municipalities in Sweden are collected from Statistics Sweden (2016), the variable is included to investigate if the total population of the municipalities have any connection to the creation of new jobs. The population variable is transformed to the natural logarithm of the population level. Mainly because the uneven distribution of the population in the municipalities in Sweden. The data are retrieved for the year 2010.

Labor participation level is measured as number of daytime working individuals (older than 16 years) in each municipality divided by the number of nighttime people of working age (15-64). Daytime individuals mean that commuting workers that live in one municipality and work in another are included as workers in the municipality where they work and as part of the nighttime population of working age in the municipality where they live. The data is gathered from Statistics Sweden for the year 2010. The variable is included to investigate if the fraction of people of working age who actually work in the municipalities have any connection to the creation of new jobs.

The data of the independent variables are gathered for earlier time periods than the data of the dependent variable. The reason for this is to solve a common problem, namely that of endogeneity. Meaning in this context that the dependent and independent variables might influence each other when measuring for the same time period.
The data is therefore cross-sectional with an element of time-series in it. The dependent variable is measured as the sum of the years included. Entrepreneurial social capital,

human capital and regional GDP are measured as the average level for 2009 and 2010. Population and labor market participation are based on data from 2010.

One regression will also be estimated when a dummy variable is included in the model. The variable is constructed so that urban municipalities are given a value of 1 and rural a value of 0. The regression for this model will include all municipalities but the extra dummy will help explaining how the urban municipalities differ from rural ones in terms of new jobs created by new firms.

4.3 Model and sample

Model: By using the variables explained above the following model will be estimated to test if entrepreneurial social capital contributes to new jobs:

Newjobs=B1+B2socialcapital+B3humancapital+B4regionalgdp+B5lnpopulation+B6laborparticipation+e. (+B7urban)

The model will be estimated using ordinary least squares (OLS). In total three regressions will be estimated, one for all municipalities, one where only rural municipalities are included and one where only urban municipalities are included. Urban municipalities are defined as municipalities with 30 000 inhabitants and/or the largest city in the municipality have over 25 000 inhabitants. Smaller municipalities which surround larger urban municipalities might also be labeled as urban if more than 50 % of the nighttime population commute to the larger urban municipality. Rural municipalities are defined as all other municipalities that do not fit the definition above (Jordbruksverket, 2016). In total there are 290 municipalities in Sweden and their objective is to govern the local area as public authority. The municipality is responsible for all public services offered in the local area. Based on the definitions of urban and rural municipalities above, there are 92 urban municipalities in Sweden and 198 rural ones. The municipalities in Sweden are extremely various in size and population. Stockholm which is the largest municipality according to population has 923 516 inhabitants, while Bjurholm which is the smallest according to population only has 2 453 inhabitants (Statistics Sweden, 2016).
In addition to the original models three regressions, one regression will include the dummy variable and one regression will use a restricted version of the original model which is explained further under the section about correlations.

5   Empirical findings and analysis

5.1 Descriptive statistics

In table 1 descriptive statistics for the variables used in the model are shown.

Table 1. Descriptive statistics of variables used in the analysis

	N	Minimum	Maximum	Mean	SD
New jobs in new firms per capita	290	0.0181	0.0976	0.0396	0.0103
Entrepreneurial social capital	290	2.4200	4.5475	3.4121	0.3812
Human capital per capita	290	0.0473	0.2687	0.0924	0.0378
Regional GDP per capita	290	0.1186	1.1263	0.2717	0.1189
Labor market participation	290	0.3100	1.4560	0.6418	0.1362
LN Population	290	7.8079	13.6495	9.8240	0.9428

Note: SD, standard deviation

As shown in table 1, the variable of new jobs in new firms has a mean of 0.0396 which should be interpreted as 0.0396 new jobs created by new firms per person on average in the Swedish municipalities during the years 2011, 2012 and 2013. The standard deviation is 0.0103 which indicates that 68 % of the municipalities are in the range between 0.03 and 0.05 new jobs created. The maximum value of 0.0976 is about five times larger than the minimum value of 0.0181. These figures indicate that the distribution of new jobs created by new firms varies quite much between the highest and lowest job creating Swedish municipalities. The entrepreneurial social capital variable has a mean of 3.41 and a standard deviation of 0.38, indicating that most of the municipalities (68 %) are between 3 and 3.8.
Regarding the control variables it is notable that human capital varies much in the Swedish municipalities. Considering the mean of 0.092 and a standard deviation of 0.038, 68 % of the municipalities are between 0.054 and 0.13. The maximum value is as high as 0.27. Another thing worth mentioning is the maximum value of the labor participation variable. The value is as high as 1.46 and this is possible because of how I constructed the variable. Namely, by dividing daytime number of workers by nighttime number of people of working age. A value higher than 1 means that there are more people working in a municipality than there are people of working age. This is possible due to commuting of workers from other municipalities. This phenomenon is mostly present in the surroundings of larger cities where people live in a suburban municipality and commute to work in a more central municipality.

5.2 Pairwise Correlations

Table 2 shows pairwise correlations of the variables used in the model. One would expect that all variables should have positive correlations with the dependent variable. Remember from the theory section that high values of social capital, human capital and labor/jobs should lead to a higher production level. Hence, we would expect new jobs, entrepreneurial social capital, human capital and regional GDP to be positively correlated. Further, in municipalities with higher levels of population the exchange of information and knowledge should be higher and therefore this variable should also be positively correlated to growth in new jobs.

Table 2. Pairwise correlations of variables used in the analysis.

	(1)	(2)	(3)	(4)	(5)
(1) New jobs in new firms per capita	1				
(2) Entrepreneurial social capital	-.11	1			
(3) Human capital per capita	.199*	.256*	1		
(4) Regional GDP per capita	.286*	.022	.287*	1	
(5) Labor market participation	.236*	.035	.110	.714*	1
(6) LN Population	-.003	.207*	.667*	.300*	.245*

Note: *, correlation is significant at .01 level (2-tailed).

As can be seen in table 2, not all variables show a positive correlation to the dependent variable. Entrepreneurial social capital which this paper is most interested in shows a negative sign. The correlation of -0.11 between entrepreneurial social capital and new jobs created in new firms is however not significant and not a very strong negative correlation either. The sign is however not what is expected based on the theory in this paper. LN population also shows a negative sign with new jobs in new firms, this correlation is however also non significant. The other control variables show positive correlations and are also significant signs. Considering the values of the correlations for these variables, which are in the range 0.2 to 0.3, they indicate that high values of new jobs in new firms are connected to high values of these variables.

Worth noticing is the fact that entrepreneurial social capital show positive correlations with two of the control variables. Namely, human capital and LN population. Also here the correlations are between 0.2 and 0.3 indicating that the relationship is not very strong but still positive and significant. This can be interpreted as in municipalities where human capital is high, entrepreneurial social capital also tends to be high. The same goes for population and entrepreneurial social capital. Based on these results one would expect that urban municipalities have higher levels of entrepreneurial social capital than more rural. Therefore it will be interesting to see what the difference will be when a dummy for urban municipalities is included in the model and what the restricted sample regressions for urban and rural municipalities will show.

Positive correlations between independent variables may also be a sign that there is multicollinearity in the model. This assumption is based on the just presented notion and the positive correlations between entrepreneurial social capital and human capital and entrepreneurial social capital and regional GDP for the urban sample (appendix). A restricted model for the urban sample is therefore also tested, in which human capital and regional GDP are not included.

5.3 Regression results and analysis

Table 3 shows the results of ordinary least squares (OLS) estimation of the two models for all municipalities and the results for the original model when the sample of municipalities are divided to rural and urban ones. The last column show the results for the restricted model.

Table 3. Results of ordinary least squares (OLS) regressions of all municipalities and by municipality type.

Variables/municipality type	All	All with dummy	Rural	Urban	Urban restricted
Entrepreneurial social capital	-.004***	-.004***	-.005***	.002	.006*
	(.002)	(.002)	(.002)	(.003)	(.003)
Human capital per capita	.108***	.109***	.141***	.080***	
	(.021)	(.021)	(.046)	(.020)	
Regional GDP per capita	.013*	.013*	.006	.038***	
	(.007)	(.007)	(.009)	.010	
Labor market participation	.013**	.013**	.014	-.016*	.011*
	(.006)	(.006)	(.009)	(.008)	(.006)
LN population	-.004***	-.004***	-.006***	.002	.003**
	(.001)	(.001)	(.001)	(.001)	(.001)
Urban		.001			
		(.001)			
Constant	.067***	.068***	.091***	.006	-.019
	(.008)	(.008)	(.012)	(.013)	.014
Number of observations	290	290	198	92	92
R-square	.180	.182	.160	.50	.276

Note: Standard errors are given in parentheses. ***p<.01, **p<.05 and *p<.1. Dependent variable: New jobs in new firms per capita. Urban: Dummy variable where urban municipalities are given a value of 1 and rural a value of 0.

The results of the original model including all municipalities shows that there is a negative relationship between entrepreneurial social capital and the creation of new jobs. The coefficient is -0.004 and significant at the 1 % level. This can be interpreted as, if entrepreneurial social capital increase by one unit, new jobs created by new firms decrease with -0.004 per capita holding the other variables constant. This relationship contradicts the theory developed earlier in this paper and is somewhat surprising considering Westlund et al. (2014) and their findings. It was however indicated by the correlation table above (table 2) that the variables were not positively related.

Regarding the other variables, all show significant signs but to some varying degree. Human capital and LN population are significant at the 1 % level. Human capital is positively related to the creation of new jobs. The coefficient of 0.108 can be interpreted as if human capital per capita increases by one unit, in this case one person with 3 years or more of higher education per capita then new jobs created by new firms increase by

0.108 per capita. The interpretation is/seems somewhat naïve since the highest amount of new jobs created in any municipality were 0.0976. However, the results show that human capital helps in the process of creating new jobs.

A bit surprising is the fact that LN population shows a negative sign on its coefficient. This would indicate that larger municipalities create fewer new jobs than smaller per capita. Given the process of urbanization and concentration of both people and jobs close to cities it would be expected that larger municipalities would create more new jobs. Especially considering the theory about knowledge externalities which should be more functional in urban areas.

Regional GDP per capita is significant at the 10 % level and the coefficient of 0.013 means that a one-million-Swedish-kronor-increase in regional GDP per capita would lead to 0.013 more new jobs created. The labor market participation variable is significant at the 5 % level and can be interpreted as: If the level of daytime working individuals increase by one person per number of nighttime individuals, then new jobs increase by 0.013. The model shows an R-square of 0.18 meaning that the independent variables explain 0.18 of the variation in the dependent variable.

When a dummy variable is included in the model and urban municipalities are given a value of one and rural a value of 0, this comes up as insignificant. Meaning that the inclusion of the dummy does not change the results of the model in any meaningful way.

Overall, the two models estimated for the full sample of municipalities show that in contrast to the theory there is a negative relationship between entrepreneurial social capital and the creation of new jobs in new firms. These results are surprising because they mean that in municipalities where firm leaders consider the business climate or, as this paper interpret it, the entrepreneurial social capital to be good, new firms create less new jobs. In the next section a discussion of the results for the restricted sample regressions for rural and urban municipalities will be made.

When the original model is estimated for only rural municipalities, the negative relationship between entrepreneurial social capital and the dependent variable increase. The coefficient shift from -0.004 to -0.005 with a significance level of 1 %. This means that for rural municipalities a higher level of entrepreneurial social capital is connected to even lower levels of new jobs created.

The impact of the control variables also change in comparison to the full sample. Human capital have a larger effect for rural municipalities than for the full sample and this relationship is not surprising considering the strong correlation between human capital and LN population. Economic growth theories are often based on the assumption that there are diminishing returns to capital (Solow, 1956). The results, showing a higher impact of human capital for rural municipalities, support this assumption, considering that the correlation (table 2) indicate that municipalities with a larger population also enjoy higher amounts of human capital. Further, regional GDP and labor market participation show insignificant results for the rural municipalities. LN population is significant at the 1 % level and the coefficient has increased from -0.004 to -0.006. Indicating that the negative relationship between population level and the creation of new jobs in new firms is even stronger for rural municipalities than for the full sample with all municipalities included. The R-square value for rural municipalities is 0.16, a small decrease from when the full sample is estimated.

For the urban municipalities the coefficient for entrepreneurial social capital shows a positive sign of 0.002. The result is insignificant, meaning that there is no evidence that entrepreneurial social capital actually effects the creation of new jobs in new firms.

The results for the control variables are interesting to analyze in comparison to the results for the rural sample. Human capital is significant at the 1 % level but the coefficient is not as large as in the rural sample regression. Regional GDP is also significant at the 1 % level, in the rural sample the relationship was insignificant. Implying that regional GDP mainly has effect in more populated municipalities, or that regional GDP starts to have effect first when the level of it is at a certain level. From table 2 it can be seen that regional GDP and LN population are positively correlated, implying that the level of regional GDP is higher where more people live.

Labor market participation is significant at the 10 % level and the relationship with the dependent variable is negative. This relation is however not surprising because it might indicate that in urban municipalities where a large part of the labor force work, less labor is available for new jobs, hence fewer new jobs are created. However, this reasoning is also based on the notion that LN population and labor market participation is positively correlated and therefore the reasoning only holds for municipalities with a high population. Notice that when all municipalities are included the coefficient for labor market participation is positive.

The last control variable LN population is insignificant for urban municipalities, indicating that in more populated municipalities the number of people does not effect the creation of new jobs negatively anymore.

Interesting is that the R-square for the restricted sample of urban municipalities is as high as 0.5. Clearly the model estimated explains the variation in the dependent variable much better for urban municipalities than for rural.

The results of the urban restricted model regression show a positive significant coefficient for entrepreneurial social capital. The coefficient is significant at the 10 % level. The result shows that when unwanted disturbance caused by multicollinearity between the independent variable and the control variables is not included in the model, entrepreneurial social capital becomes significant.

To summarize the results found in the five regressions that have been estimated, it is obvious that the level of entrepreneurial social capital is negatively related to the creation of new jobs in the rural municipalities in Sweden. For the urban municipalities no connection between the variables can be statistically accepted for the original model. However, after controlling for multicollinearity by looking at correlations between the independent variable and the control variables and testing a somewhat restricted model the relationship between new jobs and entrepreneurial social capital becomes positive and statistically significant at the 10 % level. Therefore this paper conclude that no positive relationship exists between entrepreneurial social capital and the creation of new jobs in new firms in rural municipalities. Urban municipalities show diverse results and no clear answer is seen. The answer to the research question expressed in the introduction - *Does a higher level of entrepreneurial social capital in a municipality lead to that more new jobs are created by new firms? –* is therefore no.

There might be a number of reasons to why this paper have found these negative results that contradict the theory developed in section 3. First it might be so that the entrepreneurial social capital variable is not a correct measure of true entrepreneurial social capital. As mentioned in the explanation of the variable in section 4, it is measured as the answer to the following question: *What is your overall opinion about*

the business climate in the municipality? It might be as simple as that firm leaders consider other things such as infrastructure, labor availability and number of competitors to be more important than the social connections when answering the question. The resulting variable that this paper uses might therefore be an incorrect measure of the level of entrepreneurial social capital. This problem is always present when research is being conducted about social capital and its impact on economic outcomes. To develop new measures of social capital is something that scholars have to focus on in the future, an opinion that other scholars have mentioned earlier (Westlund and Adam, 2010). The main problem with social capital is that it exists in the relations between people and firms, therefore it is very difficult to measure and quantify. Another problem might be that the data for entrepreneurial social capital is not normally distributed. Histograms covering the distribution of entrepreneurial social capital can be seen in the appendix and indicates that the distribution of the data is not perfectly normal.

Another possible explanation is that entrepreneurial social capital contributes to the creation of new jobs in a more indirect manor. Coleman (1988), found that social capital helps in the creation of human capital. In table 2 it is shown that there is a positive correlation between entrepreneurial social capital and human capital. It would be interesting to investigate if this relationship remains when running a regression on it. That is however a task that is beyond this paper. Further, the same relationship is present between entrepreneurial social capital and LN population as can be seen in table 2. It becomes even more interesting when studying the correlations to only the urban sample (appendix). It is possible that entrepreneurial social capital only has a positive effect in quite large urban municipalities. This is another field of research that might be fruitful to investigate further in the future.

Of the control variables, human capital is the most important one that effects the creation of new jobs in new firms. It has a high significance level (1 %) in all regressions and it is positively related to new job creation. Especially rural municipalities benefit from increasing the amount of human capital in the municipality. Possibly because these municipalities have a lower level of it in comparison to the urban municipalities. The resulting recommendation to policy makers who want their municipality to grow and achieve higher levels of economic prosperity would be to invest in human capital or accumulate a higher level of it.

6 Conclusion

The purpose of this paper is to investigate how the level of entrepreneurial social capital effects the creation of new jobs in new firms in the municipalities of Sweden. In order to do so, a survey from Svenskt Näringsliv is used to estimate the level of entrepreneurial social capital and theories of how social capital affects economic growth in general and the creation of new jobs in particular are presented.
The results show, when estimating a model of all Swedish municipalities as well as an extended version of this model including a dummy variable, that entrepreneurial social capital has a negative effect on the creation of new jobs in new firms. This contradicts the theory that the paper has presented and could mean that entrepreneurial social capital indeed is negative. However, there are problems with the measurement and quantifying of the entrepreneurial social capital variable used. Mainly, the survey used

to measure the social capital might also measure a great deal of other factors, rather than just the social context of a good business climate.

The municipalities were also divided into rural and urban ones to illustrate the difference between these two types of municipalities. Here the results show that rural municipalities are the ones who suffer from this negative relationship. Regarding the urban municipalities, the result could not be statistically verified, even though the coefficient for entrepreneurial social capital is positive. By restricting the model, mainly due to problems of multicollinearity, a positive significant relationship is found. However, the result is only significant at the 10 percent level and therefore not very robust.

The concept of social capital in the creation of economic growth is though still rather new and this paper claims that the theories developed earlier may still be correct. New methods of measuring entrepreneurial social capital need to be developed. Measurements that actually captures the essence of social capital. Namely, the trust, networks and social support that exists in the local entrepreneurial environment. Further, previous empirical research has shown that social capital helps in the creation of human capital (Coleman, 1988). It might be the case that entrepreneurial social capital affects the creation of new jobs via this indirect channel, since human capital is highly connected to the creation of new jobs in the Swedish municipalities.

Finally, this paper suggests that future research should focus more on urban regions in which the theoretical context of entrepreneurial social capital that this paper use comes better at hand. The results also support this notion, and the interested reader should take a look at the appendix where it shows that both entrepreneurial social capital and LN population show positive and significant correlations with new jobs for the urban sample. It might be so that only the very large urban municipalities show the desired connection that the theory predicts. More research in this field is required and it will be interesting to see how future research will deal with the problems associated with social capital and economic outcomes.

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Appendix

1. Descriptive statistics of the rural sample.

	N	Minimum	Maximum	Mean	SD
New jobs in new firms per capita	198	0.0229	0.0976	0.0398	0.0107
Entrepreneurial social capital	198	2.4200	4.5475	3.3581	0.4007
Human capital per capita	198	0.0473	0.1535	0.0764	0.0186
Regional GDP per capita	198	0.1393	0.9603	0.2640	0.1018
Labour market participation	198	0.3780	0.9809	0.6557	0.0995
LN Population	198	7.8079	10.9696	9.4670	0.6797

2. Pairwise correlations of the rural sample. **<0.01, *<0.05.

	(1)	(2)	(3)	(4)	(5)
(1) New jobs in new firms per capita	1				
(2) Entrepreneurial social capital	-.216**	1			
(3) Human capital per capita	.027	.115	1		
(4) Regional GDP per capita	.137	-.118	.110	1	
(5) Labour market participation	.102	-.003	-.029	.615**	1
(6) LN Population	-.242**	.125	.529**	.130	.153*

3. Descriptive statistics of the urban sample.

	N	Minimum	Maximum	Mean	SD
New jobs in new firms per capita	92	0.0181	0.0764	0.0391	0.0096
Entrepreneurial social capital	92	2.7265	4.4755	3.5285	0.3064
Human capital per capita	92	0.0483	0.2687	0.1267	0.0452
Regional GDP per capita	92	0.1186	1.1263	0.2883	0.1486
Labour market participation	92	0.3100	1.4560	0.6121	0.1902
LN Population	92	8.66	13.65	10.5902	0.9764

4. Pairwise correlations of the urban sample. **<0.01, *<0.05.

	(1)	(2)	(3)	(4)	(5)
(1) New jobs in new firms per capita	1				
(2) Entrepreneurial social capital	.252*	1			
(3) Human capital per capita	.593**	.285**	1		
(4) Regional GDP per capita	.563**	.236*	.417**	1	
(5) Labour market participation	.437**	.191	.399**	.848**	1
(6) LN Population	.449**	.102	.526**	.473**	.600**

5. Histogram showing the distribution of the entrepreneurial social capital variable of all municipalities.

Mean = 3,412121
Std. Dev. = ,3812178
N = 290
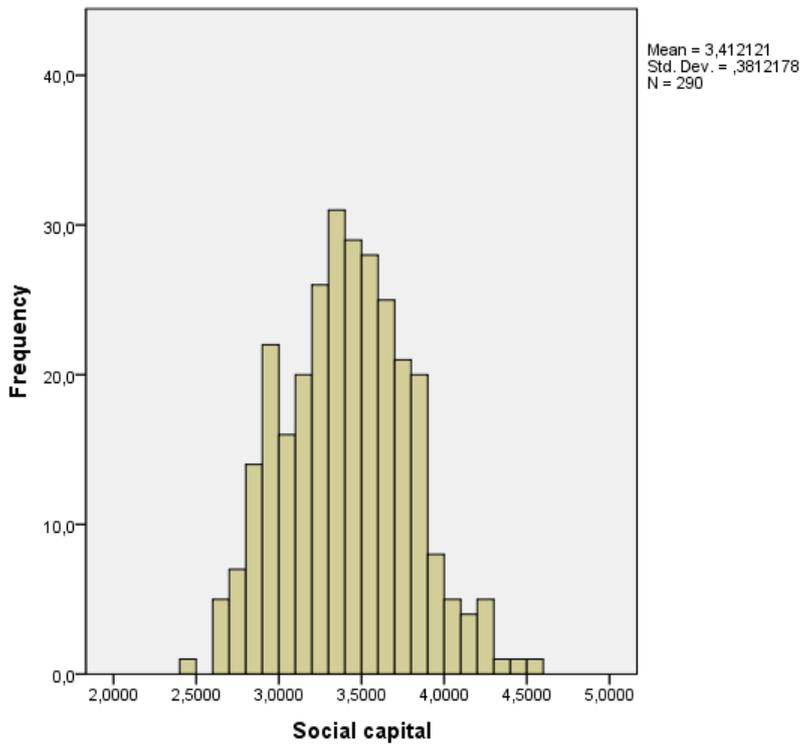
6. Histogram showing the distribution of the entrepreneurial social capital variable of the rural municipalities.

Mean = 3,358068
Std. Dev. = ,4007213
N = 198
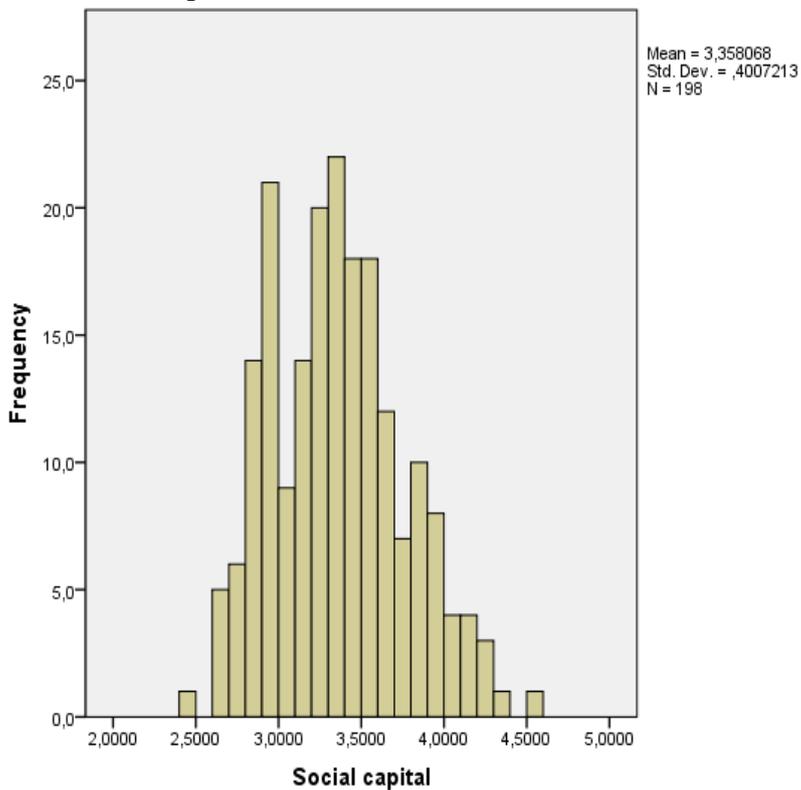
7. Histogram showing the distribution of the entrepreneurial social capital variable for the urban municipalities.

Mean = 3,528451
Std. Dev. = ,3063829
N = 92