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Regions, Human Capital and New Firm Formation

MIKAELA BACKMAN
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Mikaela Backman
Abstract

This thesis shows the importance of human capital at the individual, firm, and regional level through its effects on returns to education, firm productivity and new firm formation. The thesis further shows the importance of banks as a determinant for new firm formation at the local level. The thesis comprises of five chapters, one introductory chapter followed by four independent chapters, empirical in their nature.

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Introduction and summary of the thesis

I. Introduction

Regions are the incubators for innovation, creativity, and new firms and they shape the economic environment where knowledge spillovers are created and externalities are formed. In these perspectives, regions create the conditions for growth (Thompson, 1965; Jacobs, 1969). One of the early explanations for growth evolved around natural resources and transportation systems that influenced firms to locate in certain regions. These factors are no longer the driving forces of regional growth as economies have changed towards a knowledge and service based economy. Another feature that drives regional growth is the existence of firms that cluster in certain locations, driven by agglomeration benefits (Marshall, 1890; Porter, 1990). Causes of regional growth can also lie within the individual and the characteristics of individuals, i.e. human capital. This thesis shows the importance of human capital at the individual, firm, and regional level through its effects on returns to education, firm productivity, and new firm formation. The thesis further shows the importance of banks as a determinant of new firm formation at the local level. Human capital and new firm formation are important since they both spur economic growth. Human capital, the knowledge and skills embodied in individuals, enhances the productivity and income for the individual and comprises production and externality effects beneficial for the individual and the society as a whole. New firms benefit the firm founders and have properties that bring benefits to the whole economy, such as employment growth, innovations, and industrial dynamics.

Regions in Sweden are heterogeneous in various aspects and provide different conditions for individuals and firms. An example of this is illustrated by the three largest municipalities, Stockholm, Gothenburg, and Malmö which occupy 0.2 percent of the Swedish land area but have a considerable share of individuals with a higher education (27 percent), new firms (23 percent), population (18 percent), and employment (25 percent) in 2010. These figures show large regional differences in new firm formation and access to highly educated individuals. The top three municipalities host approximately one fourth of all highly educated individuals and new firms. To handle this municipalities are grouped in different regional categories depending on size and commuting patterns or by using econometric tools capable of handling regional heterogeneity. By grouping municipalities more homogenous groups are formed. Analysing these groups provide insights to how different types of municipalities differ from each other and the influence from different economic parameters. This generate important knowledge useful for policy
conclusions depending on the regional setting. The thesis is built up by four independent chapters, following this introductory chapter.

The second chapter, *Regional Variations of Returns to Education*, analyses individuals’ returns to education in different regional contexts. The results confirm the finding that individuals benefit from increasing their educational level. The returns to education differ according to type of location, where more urban locations have higher returns to education. Thus, the often-assumed hypothesis of equal returns to education for all regions in a country is rejected. The third chapter, *Human Capital and Firm Performance*, uses a firm perspective and examines how human capital, within and outside the firm, influences firm productivity. The findings show a positive relationship between both types of human capital, inside and outside the firm, and firm productivity. Overall, firm attributes explains most of the productivity variance. The fourth chapter, *Accessibility to Human Capital and New Firm Formation*, compares how human capital influences new firm formation in different regional categories. In the full sample, local and intra-regional access to human capital increases the rate of new firm formation. Comparing the regional categories, access to human capital differs according to their hierarchical position. More urban municipalities are only affected by local access to human capital while more peripheral, rural, municipalities are influenced by intra-regional access to human capital. The last chapter, *Banks and New Firm Formation*, analyses how different characteristics of the local bank sector influence new firm formation. A local bank sector with larger bank branches, more independent banks and bank branches per capita, and higher competitive level is positively associated with a larger number of local start-ups.

The reminder of this introductory chapter discusses how human capital and new firm formation influence regional growth. The introductory chapter further describes the Swedish framework and empirical issues. The last section summarizes the remaining chapters in this thesis.

2. Human capital in the economy

Knowledge can be embodied in several different forms, in individuals, in books, in machines, or in processes. Human capital refers to embodied knowledge in individuals, comprising qualifications acquired through education, skills acquired through learning by doing and training, inherited abilities, ethics, and habits. Individuals are in this setting knowledge carriers (Angel, 1989; Glaeser et al., 1992; Saxenian, 1994). An individual cannot be separated from these characteristics (Becker, 1964), and they can therefore not be sold or used as collateral (Pearce, 1992). The diffusion of human capital is thereby determined by the individual’s mobility across locations and firms (Becker, 1964). Disembodied knowledge on the other hand arises because of knowledge spillovers and positive externalities (Asheim, 1999).
The theory of human capital was developed by several researchers, of which Theodore Schultz (1961; 1963), Gary Becker (1962; 1964), and Jacob Mincer (1958; 1962; 1974) were the most prominent. Other active during the same period was Milton Friedman (1955). Several earlier economists regarded individuals and their skills as a component of capital and estimated their value through cost-of-production and/or capitalized-earnings procedures. Many authors included individuals or their skills when defining capital and recognized that investments in individuals raised productivity; for an overview see Kiker (1966). These early pioneers did not, however, fully develop the human capital concept or calculate rates of return to individual investments. One reason could have been the resistance to compare individuals with capital; many were reluctant to deal with individuals as property, treating individuals as slaves or machines (Schultz, 1961; Becker, 1964; Kiker, 1966).

The foundation of the human capital theory lies in the fact that individuals and firms invest in human capital based not on present gains but on future pecuniary and non-pecuniary returns. Investments include various aspects such as schooling, training, acquiring information, migration, and activities that improve an individual’s health. Disregarding the type of investment, human capital investment can be thought of as any other investment decision based on a comparison between the rates of return that equates the present values of earnings after the investment, with rates that could be obtained elsewhere (Andersson and Beckmann, 2009).

As any other capital investment, human capital depreciates. The depreciation rate of human capital differs in its time pattern compared with tangible assets (Becker, 1964). The depreciation rate of human capital is, according to Mincer (1974), likely to be related to age, experience, size, and vintage of stock. Other factors are physical deterioration, loss of mental capability, technological innovations, and unemployment, situations that make it hard to estimate the depreciation rate. Since the property right to human capital cannot be sold or transferred to another individual, it is characterized by finiteness, as the individual dies (Blinder and Weiss, 1975).

3. Human capital and economic prosperity

In the view that individuals drive regional growth, the overall level of human capital becomes a vital feature where regions differ from each other and hence create different growth patterns. The reasoning that individual knowledge and skills bring economic value is not novel. The first attempt to quantify the monetary value of individuals was made by Sir William Petty in 1691 (Kiker, 1966). The depreciation rate of human capital is around one to two percent in Spain (Arrazola and de Hevia, 2004) and for older American men (Carliner, 1982). Albrecht et al. (1999) investigate the depreciation rate in Sweden and find that different types of labor disruptions have different effects on human capital investments among men and women.
Adam Smith (2001 [1776]) recognized the ability and skills of individuals as the fourth factor of production.

A higher proportion of individuals with a high level of education can bring a one-time increase in the income level or increase the income growth rate. Thus, human capital enhancements can have both a level and a growth effect and a region with a higher proportion of human capital would therefore be wealthier compared with one with a lower proportion. Locations with a high overall level of human capital also experience a cumulative process of higher growth in the human capital level (Moretti, 2004). There is ample evidence that human capital has a positive effect on regional growth and well-being (Becker, 1964; Barro, 1991; 2001; Rauch, 1993; Blundell, et al., 1999; Funke and Strulik, 2000; Badinger and Tondl, 2003; Cohen and Soto, 2007).

3.1 Regional level

The benefits of human capital might spill over to other individuals and to the society as a whole. The social returns, the sum of social benefits because of an increased aggregate human capital level, can even suppress the private returns. Social returns are unfortunately hard to measure since the underlying benefits arise due to spillovers and externalities that are difficult to quantify.

Moretti (2004) discusses three types of externalities that arise because of a high overall level of human capital: productivity externalities, pecuniary externalities, and negative externalities. Human capital with (and without) externalities can be incorporated into growth models following two main approaches: as a factor input or through relating knowledge accumulation to human capital accumulation. These approaches include the augmented Solow model (Mankiw et al., 1992), growth accounting (Denison, 1967; Maddison, 1982; 1991), Barro regressions (Barro, 1991) and endogenous growth models (Romer, 1986; 1990a; 1990b; 1993; Lucas, 1988; Sala-i-Martin, 1996). In the endogenous growth model the average level of human capital influences firm output but is not considered in the profit-maximization decisions (Lucas, 1988). Human capital has two effects in the firm in the Lucas (1988) model: the effect on the individual’s productivity through her/his own human capital and the effect from the average level of human capital that increases the productivity of all factors of production. The positive externalities across employees arise from formal and informal meetings where individuals can learn from each other.

Sala-i-Martin (1996) used a disaggregated form of the Lucas approach where the externality effect is decomposed into two variables: (1) at the intra-firm level, where there are externality effects from human-capital-intensive individuals, and (2) at the extra-firm level, which represents the overall human capital level in the economy. Romer (1986; 1990a; 1990b; 1993) incorporates research and development (R&D) in endogenous growth models. Investment in R&D drives the production of new ideas that create new goods and/or processes or transform current ones. The ability to create these new goods
Introduction and summary of the thesis

relies on the stock and growth of human capital. These endogenous growth models assume that knowledge has some features of a public good that generate externalities since firms are unable to gain property rights over all knowledge.

Production externalities arise since human capital-rich individuals increase not only their own productivity but also the productivity of individuals with lower levels of human capital. In this case, the externality is internalized and should not be regarded as a market failure. The effect can also occur across firms where the overall level of human capital in a region increases the overall productivity (Jacobs, 1969; Lucas, 1988; Rauch, 1993; Glaeser, 1998; Gabe, 2009). The initial level of human capital is important, since studies have found a critical threshold that has to be reached before any of the benefits from human capital externalities can be reaped (Baumol, 1986; Azariadis and Drazen, 1990). A high level of human capital in a region also facilitates the adoption of knowledge that is created elsewhere (Nelson and Phelps, 1966). The growth will be faster in these regions since they have a higher rate of innovations and/or a lower cost of imitation.

Human capital externalities also take the form of pecuniary externalities based on market interactions. Acemoglu (1996; 1998) argues that human capital externalities arise due to the complementary nature of physical and human capital. If the matching of employees and employers is costly, then the equilibrium wage is a function of the overall human capital level, even in the absence of production externalities. This is due to the complementary effect between physical and human capital yielding an optimal level of human and physical capital that depend on each other. An increase in the overall human capital level induces firms to invest more in physical capital. Some workers with a lower level of human capital will then end up working with more physical capital since matching is costly. These individuals will earn a higher wage than similar workers in a less human capital-rich location. This intuition holds for the quantity as well as for the quality of physical capital and for groups of individuals with different levels of human capital (Moretti, 2004).

There can also be negative externalities from human capital. This might occur if enhancement of human capital such as education only functions as a signal of unobserved ability rather than increased productivity (Spence, 1973). Even if this is possible, empirical evidence supports the assumption that education has a causal effect on productivity (Pencavel, 1991; Altonji and Pierret, 2001; Chevalier et al., 2004).

Human capital does not only produce productivity externalities but also consumption externalities that are of importance (Haveman and Wolfe, 1984). Consumption externalities from human capital capture a wide range of welfare effects in the social environment that benefit the majority of the population. The most basic benefit is an increase in democratic involvement and social cohesion, which is a function of the education level and literacy rate (Blundell et al., 1999). Human capital enables individuals to more efficiently accumulate
information and therefore make choices that are more informed in elections that benefit the whole society, raise the turnout rate, and create well-functioning residents (Friedman, 1962; Smith, 2001 [1776]; Hanushek, 2002).

Lochner and Moretti (2004) identify reduced crime levels as the largest social gain from education. The intuition is that education increases the opportunity cost of crimes by increasing the returns to legitimate work or/and influence individuals to become more risk-averse. Other social benefits associated with a high level of human capital are good public services such as well-functioning schools, consumer services such as theatres and restaurants (Gemmell, 1997; Glaeser, et al., 2001), and increased awareness of the importance of personal, family, and public health improvements (Gemmell, 1997). Individuals with a higher level of human capital spend more money and time on charitable activities, holding income constant, which potentially increases social benefit depending on the type of activities that are pursued (Haveman and Wolfe, 1984; Iannaccone, 1990).

3.1.1 Human capital accumulations by regions

Regions can accumulate human capital and raise the overall human capital level by establishing institutions that enhance the human capital level of their inhabitants, expand current activities in higher education, or rely on in-migration of human capital-rich individuals.

Educational institutions increase the overall human capital by increasing both the supply of human capital and the demand for highly educated individuals. The supply side is obvious since the core activity of these institutions is to increase the educational level for the participants. The supply effect from educational institutions can be temporary, the human capital is increased during an individual’s education, or permanent, the individual stays in the region after completing his or her degree. Regions can also increase the supply of educated individuals by in-migration. This is in particular true for highly educated individuals as mobility is a function of the educational level (Borjas, 2002). Therefore, some locations that graduate many individuals cannot reap the full benefits since graduates move to other locations (Abel and Deitz, 2011). Regions that face a declining population growth have difficulties in attracting and retaining individuals with a higher education in Sweden (Bjerke, 2012). Individuals move to regions that are attractive in terms of employment possibilities and amenities. Amenities are location-specific goods and services that are directly incorporated into the utility functions (positive or negative) of individuals and include among other things diversity of consumer goods and services, attractive architecture, recreation areas, public services, scenic views, natural resources, crime rates, and congestion (Ullman, 1954; Gottlieb, 1995; Glaeser et al. 2001; Chen and Rosenthal, 2008). Tiebout (1956) illustrated that mobile consumers reveal their preferences for amenities by their choice of residence.
Educational institutions demand and employ individuals with a generally high level of human capital raising the overall human capital level in the location. The demand side has an additional dimension for universities through their academic R&D activities that can increase the overall demand for human capital if there are spillovers in the local economy. Evidence that both demand and supply effects raise the local human capital is found for metropolitan areas in the United States (Abel and Deitz, 2011). The studies by Andersson et al. (2004; 2009) show that the decentralization of higher education in Sweden led to increased regional as well as national productivity. Glaeser et al. (2001) argue that universities create an initial advantage that becomes self-reinforced over time, i.e. it is a cumulative process.

The number and capacity of educational institutions, in most cases determined by the government, drive the supply of educated individuals. Firms and institutions on the other hand specify the demand for educated individuals. The causality between these two forces is hard to disentangle; a higher supply of educated individuals will lead to more firms hiring these individuals. If these individuals are more productive, the demand will in turn increase. If the demand is high for individuals with a high level of human capital, the wage will increase and influence the supply. The main difference is whether the level of change is driven by institutional changes, by the state, or by a change in the economy.

3.2 Individual level

Individual investments in human capital influence future pecuniary and non-pecuniary benefits. These activities appear in many forms but the most common investment is formal education, training, and learning by doing that have the advantage of yielding a return over a long period (Schultz, 1961; Arrow, 1962; Becker, 1964).

Investments in human capital follow a life-cycle structure. Investment is a negative function of age since marginal benefits decrease over time due to a shorter pay-off period, and depreciation reduces the net gains. Hence, younger individuals invest more in themselves than older individuals since they have a longer time to recoup the cost involved in the investment. In addition, investments in later years are more costly since the foregone earnings are larger (Ben-Porath, 1967).

The perhaps most illustrated effect from human capital investments for individuals is higher earnings after deducting direct and indirect costs. Most empirical analyses focus on the return to an extra year of schooling for an individual. There is now extensive literature that examines the rate of return of education at the supra-national level (Psacharopoulos, 1994), for European countries (Psacharopoulos, 2000), and for 78 countries over a 25 year period

---

2 Lundberg’s (1961) discussion about the “Horndahl effect” (annual increases in productivity without any investments) is very close to Arrow’s (1962) learning by doing.
The development of private returns to education in OECD countries is reported annually in OECD’s *Education at a Glance*. It shows a strong positive relationship between years of education and earnings. In 2012, across OECD countries, a person with a higher education earned on average approximately 55 percent more than a person with an upper secondary education, and the earnings premium increases with age.

There are also non-pecuniary compensations associated with a high human capital level, such as better working conditions, pleasant offices, subsidized dinners, sick leave, health and life insurance, paid vacation, and beneficial pension/retirement plans that tend to improve with the level of human capital (Haveman and Wolfe, 1984; Zábojník and Bernhardt, 2001; Marshall, 2003). Another benefit of having an initial high level of human capital is the tendency of receiving further human capital investments (Blundell et al., 1999). Personal effects from a high level of human capital have several effects:

- the assigned value on leisure and quantity of leisure (Eaton and Rosen, 1980; Borjas, 2002). Blinder and Weiss (1975) and Gomes et al. (2008) find that the demand for leisure over the life cycle is concave, lower at the early investment in human capital and is maximized at retirement.
- positively related to individual and family health (Grossman, 1972; Haveman and Wolfe, 1984; Mirowsky and Ross, 1998; Cervellati and Sunde, 2005; Becker, 2007).
- lowers the probability of becoming unemployed (Nickell, 1979; Kodde, 1988; Lindbeck and Snower, 1988; McKenna, 1996; Dias and Posel, 2007; Eggert et al., 2010).
- increases the taste for “admirable” consumption activities such as reading, music, and arts (Schultz, 1961; Throsby, 1994).
- contributes positively to enhanced matching on the marriage market (Haveman and Wolfe, 1984).

### 3.3 Firm level

Firms invest in their employees by providing formal and informal training. During the training period, lower productivity is traded against future productivity gains. Becker (1962) makes a distinction between general and specific training. The training approach is an important feature but beyond the scope of the empirical testing in this thesis.

General training is beneficial for all firms. Employees profit from the investment and are therefore willing to bear the full cost of the investment, i.e. a wage below current productivity. Specific training only increases the marginal

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3 For more studies, consult Polachek (2007).
4 There is also a reverse causality between human capital and health; better health at the time of birth is associated with more schooling later in life (Victora et al., 2008).
Introduction and summary of the thesis

Productivity in the firm providing it. In the case of specific training both the employee and the employer invest in specific assets, the employee in firm-specific knowledge and the employer in the employee. They are therefore likely to honor their commitment in their employment relationship. If not, the firm loses the investment and the employee cannot get an equally high wage elsewhere. Consequently, the return and cost associated with specific investment are shared between the firm and the individual (Becker, 1962; 1964; Oi, 1961; Hashimoto, 1981). Most training is not completely general or specific but tends to increase the productivity to a larger extent in the providing firm, i.e. it has the characteristics of specific training.

Firms must be flexible and have a high degree of adaption in order to cope with changing economic situations. The demand for adaption goes hand in hand with the demand for human capital. The effective management of human capital determines the competitive advantage of firms and their performance (Prahalad, 1983; Pfeffer, 1994; Adler, 1988; Jin et al., 2010). This is the main advantage and driving force behind firm investment in human capital. As the economy changes and experience a higher degree of change, human capital becomes more and more important.

Other gains from investing in human capital are increased productivity through improving an employee’s ability to acquire and decode information about costs and inputs (Welch, 1970) and as a complement to other inputs (Griliches, 1969). Human capital also influences the productivity through a higher probability of innovations and by an increase in learning by doing. Knowledge created in other firms is more easily adapted, adopted, and imitated in a firm with a high level of human capital (Ballot et al., 2001; Boschma et al., 2009). Human capital may also have a specific effect at the managerial level and increase a manager’s capacity to handle information (Welch, 1970) and maintain and operate the best factory organization (Fleming, 1970). Individuals with a high human capital level reduce costs due to a lower turnover rate (Becker, 1962; Oi, 1961; Chang and Wang, 1996) and sick leave expenditure (Koopmanschap et al., 1995; Berger et al., 2003).

4. New firm formation and economic prosperity

The nature of a firm can be attributed to transaction costs, generally comprising asset specificity and behavioral and environmental uncertainties and used in the context of entry mode selection of existing firms in new markets (Coase, 1937; Williamson, 1975; 1985). The framework of transaction costs can also be applied to new firm formation. Transactions that demand specific investments warrant more hierarchical forms of governance, i.e. firms. New firms arise in this setting if the entrepreneurial opportunity imposes the economic actor to
make specific investments, since in this case firms will be preferred over markets in realizing the economic opportunity (Alvarez and Busenitz, 2001).

4.1 Location determinants of new firm formation

Resources in different locations vary in their composition, dispersion, and turnover. Some sites are characterized by an abundance of important input factors such as labor, capital, information, financial resources, and material. If resources are spread out, the cost of discovering and acquiring them will increase compared to resources directly accessible to the new firm. The turnover rate of resources, caused by mobility of labor and capital, generates instability (Stearns et al., 1995). Rural and urban settings have different economic environment, which influence the rate of new firm formation. The last two chapters in this thesis focus on the composition of locational features that differ across regional settings: access to human capital and to financial funds.

An urban setting produces higher demand and more diversity. The existing demand in a location is a crucial component in the creation of new firms, where both size and density of the demand influence business creation. Central and urban locations are often characterized by high-income density that is beneficial for new firms. New entrants have the choice of either locating in the center with a dense spatial market or being located in the peripheral and serving a more spatially extended market. The cost characteristics of the firm and entry dynamics, i.e. how many firms are entering at the actual time, influence the location choice (Webber, 1972). Rural locations with good access to more urban locations or being relatively central can overcome the scale problem. A higher number of competitors is often present in urban locations. A new firm in a rural setting faces less competition and it might therefore be able to explore a niche in the market (Stearns et al., 1995).

New firm formations can also vary according to industry structure where some industries provide more opportunities for the creation of firms by producing a broad range of products, by a fast growth rate, or by having lower start-up costs (Malecki, 1993; Dean and Meyer, 1996). The motives for starting a new firm might also differ in different regional settings. Reynolds et al. (2004) distinguish between necessity- and opportunity-based start-ups. Necessity-based firm creation occurs if the firm founder is forced to start a new firm due to an economic shock, such as unemployment. Opportunity-based, on the other hand, is an active choice when a firm founder identifies and acts on an economic opportunity. Many rural locations have limited employment possibilities, and consequently the creation of a new firm is not a substitute for employment in a firm but a means to avoid unemployment, i.e. opportunity-based (Friedman, 1987; Audretsch and Keilbach, 2007; Tervo, 2008).
4.2 Entrepreneurship and new firm formation

Wennekers and Thurik (1999) identify three main channels through which entrepreneurship influences economic growth: enhanced competition, innovations, and employment growth through new firm formation. They also categorize different fields of literature that connect entrepreneurship to economic growth, presented in Table 1. The Table is modified by including one column of the nature of the entrepreneur, presented in Friis et al. (2006), which also comprises empirical findings for each of the literature fields.

<table>
<thead>
<tr>
<th>Field of literature</th>
<th>Nature of the entrepreneur</th>
<th>Competition</th>
<th>Innovation</th>
<th>Firm start-up</th>
<th>Importance for economic growth</th>
</tr>
</thead>
<tbody>
<tr>
<td>Historical view</td>
<td>The creative destructor</td>
<td>Explicit</td>
<td>Pivotal</td>
<td>Implicit</td>
<td>Explicit</td>
</tr>
<tr>
<td>Neoclassical</td>
<td>The expert</td>
<td>Explicit</td>
<td>Implicit</td>
<td>Not present</td>
<td>Implicit</td>
</tr>
<tr>
<td>Austrian</td>
<td>The arbitrageur</td>
<td>Explicit</td>
<td>Implicit</td>
<td>Not present</td>
<td>Explicit</td>
</tr>
<tr>
<td>Endogenous growth theory</td>
<td>The profit maximizer</td>
<td>Implicit</td>
<td>Pivotal</td>
<td>Not present</td>
<td>Implicit</td>
</tr>
<tr>
<td>Economic history</td>
<td>The law abider</td>
<td>Explicit</td>
<td>Pivotal</td>
<td>Implicit</td>
<td>Pivotal</td>
</tr>
<tr>
<td>Management literature</td>
<td>The organizer and coordinator</td>
<td>Implicit</td>
<td>Pivotal</td>
<td>Explicit</td>
<td>Explicit</td>
</tr>
<tr>
<td>Industrial economics</td>
<td>The opportunity maximizer</td>
<td>Pivotal</td>
<td>Pivotal</td>
<td>Explicit</td>
<td>Pivotal</td>
</tr>
<tr>
<td>Evolutionary economics</td>
<td>The fittest</td>
<td>Pivotal</td>
<td>Pivotal</td>
<td>Pivotal</td>
<td>Pivotal</td>
</tr>
</tbody>
</table>


The focus here will be on firm start-up. The role of the entrepreneur for economic growth and development is unambiguous in the historical view. The entrepreneur is in this setting the cause of economic development and transition since he/she is the economic actor that forms new combinations (Schumpeter, 1934). Firm formation is important since it is where the entrepreneur manifests the new combinations. The relation between entrepreneurship and economic growth is also dependent on the institutional settings that frame the incentives and possibilities in the economy. Entrepreneurship includes actions that bring positive or negative consequences to society depending on the institutional setting (Baumol, 1994).

The neoclassical setting assumes perfect information, rational and clear economic objectives, and markets that work perfectly at the equilibrium price.
In this framework, there is no need or room for a firm to be innovative or risk bearing. Hence, firm formation is not present in the theoretical setting. The Austrian literature focuses on the market process and the entrepreneur as an agent that directs the system towards equilibrium. The entrepreneur works as an arbitrageur and does not need a firm to seize profit opportunities, and hence the creation of new firms is of minor importance (Foss and Klein, 2005). The endogenous growth model assumes that entrepreneurial opportunities arise from investment in new knowledge, i.e. R&D activities, by existing profit-maximizing firms. Endogenous growth models use the firm as the exogenous decision-making unit but the ability to generate technical change is endogenous. In this model, there is no need for start-ups since the incumbent firms create the technological change (Romer, 1990b; Acs et al., 2009).

The economic history view is mainly concerned with the embedded institutions and culture in a country. The intermediate linkage in which entrepreneurs influence their surrounding is by entering new markets, being innovative, increasing the level of competition, and starting new firms (Wennekers and Thurik, 1999). The management literature incorporates the notion of entry but uses a broad definition. A new entry encompasses a new firm, entering into a new market, or entering an established market with new or existing products (Lumpkin and Dess, 1996). Start-ups per se are not the only focus of the management literature as it also emphasizes entrepreneurial activities in large firms. Porter (1990), as the advocate for the industrial economics field, identifies four main factors that make up a nation’s competitive advantage. Entrepreneurship and innovations are prevalent in all four and are emphasized as being the core of a country’s competitive advantage. New firm formation is fostered by internationally competitive suppliers and related industries and is vital since it influence the structure and cultural setting in a country yielding a stronger competitive advantage. The evolutionary school combines ideas from Schumpeter and Darwinism developed by, among others, Nelson and Winter (1982) and Eliasson (1994). Here the survival of the fittest is applied to firms. This school also focuses on learning mechanisms, i.e. the accumulation of competences in individuals. The competence capital is allocated and reallocated by the entry and exit of firms and by the labor market. Hence, new firms are knowledge carriers.

4.3 Firm formation and economic prosperity

There is a strong consensus in the literature that business creation and economic growth at the regional level are closely related. For a cross-country overview, see the annually published Global Entrepreneurship Monitor. In the study in 2000, the creation of firms is identified as the most important factor for economic growth (Reynolds et al., 2000). The impact of the creation of new firms on economic growth is, however, not instantaneous since it takes some time before the full effect is seized by the economy (Fritsch and Mueller, 2004;
Introduction and summary of the thesis

Reynolds et al., 2004). Empirical studies investigating new firm formation and employment over a longer time have identified that the effect emerges over a period of approximately ten years. The detected pattern resembles a wave; for an overview see Fritsch (2008). This implies that new firm formation has direct and indirect effects on employment and that the indirect effects, e.g., new businesses challenging existing firms and being subject to competition and market selection, take longer time to transfer into the economy.

Firm formation and economic prosperity are closely related and work through several underlying mechanisms. First, new firms are often entrepreneurial and have a high proportion of innovative activities. They therefore act as bearers of change leading to industrial renewal and creation of new jobs, emphasized in several studies (Acs and Audretsch, 1990; Acs, 1992; Acs et al., 1994; Audretsch, 1995; Tang and Koveos, 2004; Koellinger, 2008).

Second, new firms influence the industrial dynamics in a location but the impact differs among industries and over time (Audretsch, 1995). New firms per definition change the industrial dynamics by entering the market and increasing the competition level. New firms also tend to have a faster and more diverse growth and are more prone to exiting the market, factors influencing industrial change (Evans and Leighton, 1989). Jovanovic (1982) models the industry evolution of heterogeneous firms that learn about their abilities over time. Efficient firms survive, while inefficient firms are forced to exit the market. The advantages of having a larger proportion of small firms are emphasized in Audretsch et al. (2002) and Carree and Thurik (1998). They find that countries experiencing a faster restructuring of their industry, made possible by the entry and exit of firms, experienced faster economic growth, measured in GNP.

Third, new firms work as a counterforce to market imperfections such as monopolies and monopolistic behavior. Fourth, small firms are more flexible giving them a competitive advantage and making them more able to handle and adapt to external shocks (Wennekers and Thurik, 1999). Last, new firms increase the consumption bundle satisfying consumers’ love of variety (Rothwell, 1989).

The role of new firms for employment growth has been widely debated. The claim that small firms contribute to a larger proportion of employment share given their size was already made by Birch (1979). Focusing on Europe, employment growth is larger in small firms than in larger firms (EIM/ENSR, 1997). Fölster (2000) finds a positive relationship between self-employment and overall employment in Swedish counties for the period 1976 to 1995. Analysing a shorter period, Davidsson et al. (1994) conclude that small firms function as an engine for new employment in Swedish municipalities in the period 1985 to 1989. Analysing a later period, 1975 to 1999, Braunerhjelm and Borgman (2004) finds a positive relationship between start-ups and employment growth. Not all studies support the idea that new firms are the main drivers of employment growth. Blanchflower (2000) does not find any evidence that an
increase in self-employment leads to real economic growth. Davis et al. (1996) and Bednarzik (2000) identify the largest employment growth as growth in existing firms rather than new firms. In the literature overview by Karlsson and Nyström (2007), there is supportive evidence that firm formation positively influences productivity and economic growth but weaker evidence in favor of employment growth.

The relationship between new firms and unemployment is not straightforward (nor is the relation between unemployment and start-ups). New firms in need of labor will reduce the unemployment rate (Audretsch and Thurik, 2000; Pfeiffer and Reize, 2000). This effect will, however, be limited if only a small number of the new firms are in need of labor input and if their survival rate is low (Geroski, 1995).

5. Human capital and firm formation. The case of Sweden

Before focusing on human capital and new firm formation, a brief historical outlook for Sweden is presented. The agricultural sector dominated in Sweden before the industrial revolution. The industrialization process started relatively late in Sweden but due to great imitation, adoption, and innovation capabilities, Sweden reached the same development level as other developed countries. Institutions and reforms that fostered growth were established, such as increased freedom of trade, abolishment of the guild system, and introduction of the inheritance law. This contributed to increased investments and innovations in the iron, steel, and wood industry, which increased productivity and business creation. Through a reform of the elementary school system, the human capital level increased. These building blocks enabled a fast industrializing process in Sweden and formed the backbone of the Swedish industry (Eklund, 2010).

The “Swedish model” was developed during the 1930s and culminated in the 1960s. A large privately owned industry sector, a large tax-financed public sector, strong unions, active labor market politics, and a strong ambition of equalization characterize the Swedish model (Eklund, 2010). Sweden is still a mature welfare state with a large share of publicly financed or subsidized personal services such as education, childcare, and health.

The history of strong trade unions started with the Saltsjöbaden agreement in 1938. Detailed collective wage agreements emphasizing egalitarian objectives dominated among white-collar and blue-collar unions during the 1950s and 1960s. The unions emphasized equal wages for equal jobs leading to wage equalization between and within sectors, i.e. across occupations and levels of skill. Until the breakdown of central wage formation in the early 1980s, wage differentials for blue-collar workers diminished sharply. From the 1990s, the wage formation process was conducted at the sector and firm level and based
on skills and firm profit increasing the wage differentials (Hibbs and Locking, 2000).

5.1 The Swedish system of higher education

There has been an increasing emphasis from the Swedish government on education and lifelong learning since this is viewed as an essential part of a well-functioning and prosperous economy. Sweden in 2000 established the political goal that half of the young generation (below the age of 25) should obtain higher education (Johansson et al., 2003b). The enrolment rate in higher education in Sweden has increased steadily since 1990.

In 1977, Sweden had 11 institutions of higher education, universities, and institutes of technology with affiliated colleges. In 1977, the educational system was reorganized and a number of independent university colleges were established. The real expansion started in 1987 when a spatial decentralization strategy of higher education was decided. The strategy was motivated by several political, social, and economic factors (Andersson et al., 2004). In 2012, there were 47 institutions of higher education located all over Sweden. Most institutions of higher education are located in the south of Sweden, where they are evenly spread out, increasing the access to higher education. Stockholm being the capital of Sweden hosts the largest number of institutions of higher education.

The financial barrier to entering higher education is low in Sweden since there are no tuition fees and a general system with study allowances and grants open for everyone. Nearly two thirds of all the participants in higher education apply for study allowances, which are designed to allow for a high participation rate in higher education. Study loans and grants in Sweden are based on the student’s own income (Asplund et al., 2007). Even though the study allowances are designed to reduce social, economic, and geographic differences, there are disparities in the enrolment rates among groups with different backgrounds. Factors such as the parents’ educational level and social background influence the choice to engage in higher education. The gender aspect is twofold. In general, women have a higher enrolment rate but not in more prestigious study programs (Andersson and Lindblad, 2008). In sum, there is good access to higher education both geographically and financially. This together with the low wage disparity in Sweden might cause the lower rate of return at all educational levels but in particular in higher education.

5.2 New firm formation

In a European comparison, the birth rate of firms is low in Sweden (Schrör, 2008). This partly originates from the institutional framework in Sweden. North
(1990) and Baumol (1990) emphasize the importance of the institutional setting for both the rate of entrepreneurship and the type of entrepreneurship, i.e. productive, unproductive, or even destructive. The social payoff structure determines if the fixed entrepreneurship talent is devoted to productive or unproductive activities.

The institutional framework affects the choice of work, the quantity of market work, and the intensity of work, along with many other factors. The institutional setting of the tax and welfare arrangements lowers the incentives for business creation, both necessity- and opportunity-based, since the payoff structure has a negative effect on the entrepreneurial returns, in both relative and absolute terms. The culture of an entrepreneurial state is also hard to incorporate and match with that of a welfare state (Henrekson, 2005). The complex tax system and the generous transfer system in Sweden function as factors discouraging individuals to start new firms. First, individuals experience a high level of security being an employee. Second, the needed compensation for risk taking when starting a new firm is reduced by the heavy tax burden. Third, the high bureaucratic costs and the tax system reduce incentives for individuals to allocate financial and human capital to business creation. Last, the generous transfer system does not push individuals to start a firm out of necessity (Agell, 1996; Lindbeck, 1997).

Turning the perspective from the country level to within variation in Sweden, new firm formation rates differs across the urban-rural hierarchy. The total number of start-ups is highest in urban locations, in particular in the regions where the three largest cities in Sweden are located: Stockholm, Gothenburg, and Malmö. The difference across regional categories is less evident when looking at the relative numbers, dividing the total number of new firms by the number of individuals in the labor force. In absolute and relative terms, new firm formation in the agriculture, fishery, and forestry sector is highest in peripheral municipalities, i.e. in a more rural setting. Start-ups in the service sector are on the other hand highest in urban locations both in absolute and relative terms.

6. **Empirical issues**

The four independent chapters following this introductory chapter are empirical in their nature. Hence, they use empirical findings to test hypotheses. All chapters discuss issues related to human capital and/or new firm formation but use different datasets and methods. The second and fourth chapters use longitudinal data covering the period 1998 to 2008 (Chapter 2) and the period 1997 to 2007 (Chapter 4). Both chapters use a fixed-effects model, a random-effects model, and a pooled ordinary least squares model. The dataset used in the second chapter concerns employees. The unit of analysis in Chapter 4 is municipalities. The third chapter includes firms in the business service sector in 2008. The analysis uses a multi-level model since the data can be structured on
different levels, i.e. it has a hierarchical structure. The fifth and last chapter analyses the influence of banks on new firm formation in 2010 at the municipal level and uses an instrumental variables approach. All datasets originate from Statistics Sweden and have restricted public access.

6.1 Measuring human capital

Human capital theory has a long history, and the importance of human capital for economic well-being is hard to dispute. There has, however, been a discussion on how to measure human capital in the most accurate way, i.e. how to measure the skills and knowledge of individuals. Human capital can be defined in a broad sense and can be acquired through many different channels. This kind of reasoning is found in Marshall (1890) and Jacobs (1969). They both discuss the role of human capital in the development of cities, and they use a broad definition. Marshall, for example, describes human capital as learning by doing and the introduction of new skills by immigrants. It is possible to detect two narrower interpretations of human capital in more recent studies: educational level or occupational status.

The traditional way is to measure human capital through the education level of the individual or the share of the population with a certain degree (Glaeser et al., 1995; Glaeser and Maré, 2001; Glaeser, 2005). Another strand of research emphasizes the type of work that an individual performs, i.e. the occupational status (Fuchs, 1971; Polachek, 1981; Andersson, 1985; Florida, 2002; Florida et al., 2008). The educational and occupational approaches are typically highly correlated (Brakman et al., 2005; Glaeser, 2005; Hansen, 2007). It is then not surprising that the different measures only perform marginally differently, in statistical terms (Rausch and Negrey, 2006; Wojan et al., 2007; Donegan et al., 2008). Other studies claim that there are substantial differences between the two measures supporting the superiority of either the educational or the occupational approach (Marlet and van Woerkens, 2007; McGranahan and Wojan, 2007; Hoyman and Faricy, 2009).

Even if the two approaches to measure human capital are highly correlated, there are clear differences. The educational approach is a measure of the amount of skill and can be seen as a vertical definition using the assumption that the amount of skill an individual possesses is equal to the educational level. The education level can be seen as a labor supply factor. The occupational status gives the type of skills, i.e. a horizontal differentiation. The occupational measure is also a reflection concerning occupations that firms demand and value, i.e. a labor demand factor. Other ways of measuring human capital are by the experience level or job tenure (Mincer, 1962; Kambourov and Manovskii, 2009), the replacement cost (Judson, 2002), or the wage of the individual (Mincer, 1962; 1996; Majumdar, 1998). No single definition of human capital can display the whole picture of the amount and type of skills; the best approach is perhaps not to see them as substitutes but as complements.
6.2 Regional categories and their position in the hierarchical system

In this thesis, municipalities are organized into different regional categories. The spatial organization of economic systems can be analysed by means of the central place theory (Christaller, 1933; Lösch, 1940). The central place theory claims that locations of different sizes differ in the type of goods provided, which is determined by the location’s centrality, i.e. its position in the hierarchical system. The focus is on how goods and services are allocated between different locations of varying degree of centrality and how these are distributed over space. The supply of goods and services is determined by internal returns to scale. Goods that face limited internal returns to scale are spread out through the economy and can be accessed in many locations of different sizes. Goods that are bought less frequently are supplied in fewer locations evenly spread out geographically. A hierarchical system of locations arises where larger cities perform more functions than smaller lower-level locations. Smaller locations supply lower-order goods while the larger cities supply higher-order goods. The higher-level locations generally provide the functions found at lower levels as well as other functions non-present at lower levels. Hence, central locations have a wider range of goods and services, more firms, and a larger population than less central locations. The number of locations decreases as one moves up on the hierarchical ladder. More centralized, larger locations are also more spread out. The relative centrality distinguishes the type and variety of goods that are provided. Another feature of the theory is the role of locations for supplying the surrounding area with goods and services. Locations at higher levels tend to have a larger catchment area and have a higher functional complexity than lower-level locations (Mulligan, 1984). The uneven distribution over space creates core-periphery structures and agglomerations at different geographical scales. Local agglomerations denote smaller cities, and regional agglomerations characterize concentrations at the highest hierarchical level, such as large cities (Hall, 1969; Karlsson and Nilsson, 2002).

The categorization used in this thesis is based on functional regions, formed by grouping several municipalities between which the commuting intensity is high. In this case, Sweden’s 290 municipalities form 81 functional regions. The grouping is based on administrative borders (municipalities). Administrative regions are useful in assessing economic relationships and interactions, and are not outperformed by economically determined regions (Cörvers et al., 2009).

The functional regions form a common market for labor, housing, and household and company services, and form the home market for most firms. Municipalities that belong to the same functional region can be divided into one central and several peripheral municipalities. The central municipality has the largest number of residents and the highest inward commuting in absolute terms in a functional region, and its labor market functions as the engine of the
whole region. Economic agents interact in a variety of ways but face-to-face contacts mainly take place inside the functional region. There are often many cities in the functional region but it is only the largest city, i.e. the central municipality that is large enough to support services that demand frequent face-to-face contacts (Johansson et al., 2003a). The development conditions for large and small functional regions are different. Larger functional regions have a large central municipality that works as a driving force for both the central and the surrounding municipalities. Small functional regions often lack this shared growth factor (Johansson and Klaesson, 2007).

The regional categories used in this thesis are: (1) Metropolitan functional regions, (2) Central municipalities, (3) Peripheral municipalities in larger functional regions, and (4) Peripheral municipalities in small functional regions. The first category comprises municipalities that belong to the functional regions with the three largest cities in Sweden: Stockholm, Gothenburg, and Malmö. There are 61 municipalities in this category. The three largest cities correspond to the highest hierarchical level supplying a wide range of goods and services. The municipalities that belong to these functional regions have commuting access to these goods and services. In metropolitan functional regions, higher-order goods are often supplied in the whole region and not limited to the central municipality. They are also often supplied in other municipalities affiliated to the metropolitan functional region.

The second category comprises 78 municipalities and contains the central municipalities except the three largest cities in Sweden. These municipalities host the largest town in each functional region and they are relatively central locations providing more higher-order goods compared to peripheral municipalities.

The last two categories contain the non-central municipalities in the non-metropolitan functional regions. The definition of a large functional region is one with a total population above 100 000. This category contains the largest number (102) of municipalities. Only 49 municipalities are classified as peripheral municipalities in small functional regions, i.e. those with a total population below 100 000. These regions are considered to be at the lowest level in the hierarchical system and provide lower-order goods and services. Consumers in these locations reach more goods and services by commuting but depending on the size of the functional region, they only reach a certain hierarchical level.

The structure and character of a municipality is in this thesis also described by an accessibility measure, derived by Johansson et al. (2002; 2003a). The accessibility of municipality $s$ to all other municipalities $v$ is presented in Equation 1:

$$A_s = \sum_{v=1}^{n} N_v \exp(-\lambda t_{sv})$$ (1)
where \( N_v \) is the economic opportunity in municipality \( v \). The opportunity measure \( N_v \) can stand for several different aspects such as population, gross regional product, R&D investments, wage sum, customers, supply of producer services, and supply of educated labor. \( \lambda \) is the time sensitivity parameter pre-estimated by using data on commuting, and \( t_{sp} \) is the travel time by car between municipality \( s \) and \( v \), gathered by the Swedish Road Authority.

The accessibility measure can be computed at three different levels: a local, an intra-regional, and an extra-regional level. This distinction is natural since the time sensitivity parameter differs according to distances that correspond to the different regional scales. The value is smallest for within-municipality interactions, below approximately 15 minutes of travel time, followed by extra-regional travels of above approximately 50 minutes, and is highest for intra-regional travels, travels that take approximately 15 to 50 minutes. This indicates that individuals that commute over short or long distances do not care much if the commuting time is increased. The accessibility measure can also be defined as the sum of the three measures giving a location’s total accessibility disregarding their internal differences. The total accessibility is foremost comprised by the local and intra-regional accessibility since the average distances are much smaller than extra-regional distances.

Depending on the unit of the economic opportunity, \( N_v \), the accessibility measure can portray different economic aspects such as human capital using access to individuals with a higher education or proxy market potential using gross regional product, wages, or other measures of income. It can in the latter case be viewed as an agglomeration measure by reflecting the density of economic activities (Andersson and Noseleit, 2011). Density is most often defined as economic units divided by the geographical scope of a region, such as population per square kilometer. The accessibility measure can be said to capture density since it combines the size of the economic activity with the extension of the location, measured by the average travel time. The use of travel time by car has the advantage of capturing proximity and actual interaction opportunities present in a location. This is perhaps most valid for the local and intra-regional accessibility measure. Total accessibility can also be used as a proxy for density considering that local and intra-regional accessibility comprises approximately 95 percent of total accessibility.

### 6.3 Firm performance measure

In the third chapter, the research question is how human capital in the firm and in the surrounding environment influences firm productivity, measured as value added per employee. Value added per employee has been extensively used to measure firm productivity.\(^6\) Value added is the wealth generated by the firm’s

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\(^6\) For an overview of performance measures used in studies analysing human capital see Hansson et al. (2004).
productive use of its resources. Firm resources include tangible and intangible assets that have been internalized by the firm. Intangible assets refer to human capital, among other things. The analysis is based on firms in the business service sector, and since such firms often are labor intensive, it is likely that labor is the main productive resource. There is a close connection between value added and real output (Rigby and Essletzbichler, 2002).

However, there are some drawbacks with this productivity measure that should be acknowledged. Accounting data may be associated with flaws due to differences between firms’ accounting policies or managerial manipulation, rather than actual variances in performance (Mueller, 1990; Herremans et al., 1993). Even though only one sector is analysed, there might exist structural differences across industries belonging to the same sector affecting firm productivity. These differences incorporate variations in the concentration level, market power across firms in an industry, and differences in demand (Syverson, 2011). These differences are not only valid across industries but also across locations. Another issue revolves around how to measure output and quality in the service sector, which is found to be more difficult than in the manufacturing sector (Griliches, 1979). Quality improvements may not increase the number of outputs per input but instead increase the price of the product (Syverson, 2011).

7. Summary and contribution of each chapter

This thesis shows the importance of human capital at the individual, firm, and regional level through its effects on returns to education, productivity, and new firm formation. The thesis further shows the importance of banks as a determinant for new firm formation at the local level. The last two chapters focus on regional determinants of new firm formation. These two chapters have considerably different emphases; one is on access to human capital, a labor market perspective, and the second on banks, an institutional perspective.

The second chapter, Regional Variations of Returns to Education, focuses on the individual and the benefits of acquiring a higher education. The chapter contributes to the extensive literature by comparing returns across regions instead of countries. Individuals with a higher education are associated with many positive production and consumption externalities and provide an important factor for regional well-being. The location decision of individuals is partly influenced by the returns to education, and regional differences in returns to education can thereby provide insights into the geographical diffusion of human capital.

Locations are heterogeneous in terms of size, natural resources, amenities, and industrial composition, and consequently returns to education are expected to vary over geographical space. Workers with similar jobs and educational
levels will have different wage levels due to different location premiums. The marginal effect of education is identified by estimating a Mincerian wage type equation using a fixed-effects model controlling for unobserved individual ability. The results show that returns to education differ according to type of location, and the often-assumed hypothesis of equal returns to education for all regions in a country can be rejected. Individuals living in municipalities in metropolitan functional regions have the highest returns to education and those living in peripheral municipalities to small functional regions have the lowest returns to education. The difference is statistically significant but of a small magnitude. This chapter extends the knowledge about regional differences in returns to education by using Swedish data. The case of Sweden with its history of wage equalization and egalitarian policies is particularly interesting. If there are differences in Sweden, there ought to be differences in countries with more wage diversity.

The third chapter, Human Capital and Firm Performance, analyses the impact that human capital has on firm performance. One feature that distinguishes this paper from others is the clear distinction made between human capital in the firm, the characteristics of the employees, and human capital in the surrounding economic environment. The chapter contributes to the expanding field of research that uses employee-employer-matched data. Firms benefit from a high level of human capital, measured by both the amount and the type of skills, through increased productivity. The overall level of human capital influences the firm by positive production externalities.

The data include a large sample of Swedish firms in the business service sector with detailed information about the employees and the firms. The empirical analysis includes firm-, industry-, and regional-specific factors. By using a multi-level model, the firm-, industry-, and regional-specific factors can be analysed and compared. The result shows a positive relationship between human capital, within and outside the firm, and firm productivity. Overall, the firm attributes explain the largest share of the productivity variance.

The fourth chapter, Accessibility to Human Capital and New Firm Formation, co-authored with Charlie Karlsson, analyses the role of human capital accessibility for new firm formation. This chapter adds to the literature concerning the regional determinants of start-ups by thoroughly analysing human capital and its spatial distribution. Special emphasis is given to the role of the position of localities in the hierarchical spatial system. Since human capital is partly spatially bounded, access to human capital in the own municipality is expected to have a larger impact than in the surrounding functional region (intra-regional accessibility) and in the rest of Sweden (extra-regional accessibility).

The empirical analysis is based on data for the period 1997 to 2007 and uses information at the municipality level in Sweden on new firm formation and access to individuals with a minimum of three years of higher education. For all municipalities, the empirical analysis shows that the local and intra-regional access to human capital has a positive impact on new firm formation. Overall,
the regional labor market is the most important driver of new firm formation. The impact from local, intra-regional, and extra-regional accessibility differs according to regional category. The overall conclusion is that in order to promote start-ups, a municipality must have access to human capital in the own municipality or in municipalities within commuting distance.

The last chapter, Banks and New Firm Formation, analyses what characteristics of the local bank sector that influence new firm formation. This chapter corresponds to the literature that emphasizes the importance of banks for the non-financial sector and especially for creation of firms. The focus is often on the competition level in the bank sector. This chapter contributes to the existing literature by giving a more detailed picture of the local bank sector and highlighting regional differences. The emergence of new technologies and a highly globalized economy tends to reduce the importance of physical distance when transferring information, and many bank services are such that they can be completed online. Even so, if a firm founder is forced to seek external finance in order to start a firm, face-to-face contacts are normally required, and these are costly and distance-sensitive. The prospect of financing also depends on distance-sensitive information that the bank possesses about the firm founder, the project, and the economic environment in which the firm will compete. Overall, the type of bank service involving a loan for business creation tends to be local.

The results show that the structure of the local bank sector influences the new firm formation rate. A local bank sector with larger bank branches, more independent banks per capita, and more bank branches per capita is positively associated with local start-ups. Hence, access to financial funds is important for new firm formation. There is no consensus in the literature about the effect of competition in the banking sector on business creation. There is, however, an empirical coherence in this paper that competition (decreased concentration) is positively associated with the formation of new firms.

There are differences across urban and rural locations concerning the importance of local bank branches. Independent banks per capita and bank branches per capita are significant and positive in both categories but the elasticity is higher in rural municipalities. These findings accentuate the importance of banks for new firm formation in these municipalities, since other financial sources are concentrated to metropolitan regions.

The importance of human capital is well supported in this thesis. In future studies it would be interesting to analyse the underlying factors that determine the regional level of human capital. This approach can be divided into demand factors (firms’ demand of certain qualifications, industry structure, etc.) and supply factors (location of higher education institutes). The regional determinants of new firm formation are highlighted in the last two chapters in this thesis. In future research, the perspective can instead of the regional level be at the individual level. One aspect is the age of the individuals that choose to become self-employed: Are older individuals more inclined to start new firms,
and if so, are those firms more likely to survive? Another perspective is the educational level of the individual. From the fourth chapter in this thesis we can conclude that the overall level and access to highly educated individuals is good for the creation of new firms. In the next step, it is informative to see if it is the highly educated that actually starts the new firms or become self-employed. There is not a clear relationship between the level of education and the probability of becoming self-employed in the theory so empirical results on the issue is useful. The local bank sector’s influence on the non-financial sector could be studied in more detail, analysing the effect on growth of firms, exit of firms, and the industrial structure (presence of large and small firms).
References


Introduction and summary of the thesis


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Collection of Articles or Papers

Paper 1
Regional Variation of Returns to Education
Mikaela Backman

Paper 2
Human Capital in Firms and Regions: Impact on Firm Productivity
Mikaela Backman

Paper 3
Accessibility to Human Capital and New Firm Formation
Charlie Karlsson & Mikaela Backman

Paper 4
Banks and New firm Formation
Mikaela Backman