

Microenterprises as the Growth Engines in Economies - The modeling of microenterprises in the existing growth theories and the real life survival from an innovation to a successful entrepreneurial venture

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Abstract

Microenterprises and new knowledge are regarded as important growth drivers today. The objective of the thesis is to consider whether the existing theories take the microenterprises and new knowledge into account in the assumptions and in the models themselves. The traditional neoclassical growth theory by Solow and the more modern one, the endogenous growth theory are chosen as the theories to begin with. It is noticed that neither of the theories take into account the growth drivers proposed by literature and empirical research. As a result, the modified endogenous growth theory, the endogenous growth theory of entrepreneurship is introduced and discussed in detail.

The endogenous growth theory of entrepreneurship assumes that as a consequence of new, spilled over knowledge, entrepreneurial opportunities are created. Thus the model makes the important assumptions that new knowledge needs a mechanism by which it transforms into opportunities, commercialized products and ultimately into profits and economic growth. The mechanism is a new enterprise.

However the endogenous growth theory of entrepreneurship depicts the real growth factors better than its predecessors, the assumption underlying the model that microenterprises are the growth factor brings new deficiencies. The model does not take into account the decision of becoming an entrepreneur and the factors affecting that decision. The most important deficiency is that the financial situation is extremely difficult for microenterprises. The traditional lending institutions, banks, and the formal venture capitalists refuse to lend capital to such high risk ventures. As the thesis proposes, business angels are usually the only option for the microenterprises to receive investment capital that they need for growth. It could be advantageous for the endogenous growth theory of entrepreneurship to take into account also the financial situation of the microenterprises since it affects the establishment, success, growth and disappearance of such enterprises.

The thesis proposes that informal venture capitalists are the main source of financing for microenterprises and that the venture capital markets are inefficient since demand exceeds supply clearly. Actually, the findings are so convincing that the thesis proposes that often without business angel capital, microenterprises cannot grow and thus much growth potential also at the economy level is wasted. Business angels clearly contribute to economic growth.

The final objective is to propose that the hands-on involvement of business angels actually enhances the growth rates of the investee microenterprises. The source of the value added is the business angels' accumulated human and social capital. By participating with the investee enterprise, business angels perform particular value adding roles which increase the firm growth rate even more. The basis for the argumentation is on the notion that the new entrepreneurs lack all kinds of economical skills; financial, sales and marketing, management, strategic viewpoints as well important networks, among others.

Keywords: economic growth, business angel, venture capital, entrepreneurship, innovations

Table of Contents

1. Introduction	5
1.1 The connection between innovation oriented new enterprises, informal capital and economic growth	5
1.2 Research problem and the frame of reference	8
1.3 The structure of the thesis	8
1.4 Key concepts.....	9
2. The connection between entrepreneurship and economic growth	11
2.1 From Managed Economy to Entrepreneurial Economy.....	11
2.2 Entrepreneurship.....	13
2.2.1 The definition of entrepreneurship	13
2.2.2 Causes for the birth of new enterprises.....	14
2.2.3 Economic knowledge	16
2.2.4. The lack of entrepreneurship and its effects on economic growth	17
2.3 Neoclassical theory of economic growth	18
2.4 The theory of endogenous growth	21
2.4.1. The basic structure of the endogenous growth model	23
2.4.2 The knowledge spillover theory of entrepreneurship	28
2.4.3 The knowledge filter, entrepreneurship and endogenous growth.....	30
3. Venture capital and the venture capital market participants.....	38
3.1 Venture capital	38
3.1.1 The definition of venture capital	38
3.1.2 The different financing options growing microenterprises face	40
3.2 The venture capital market	43
3.2.1 The venture capital market participants	43
3.2.2 The evolution of the venture capital markets in Europe and Finland	47
3.2.3. The economic significance of informal venture capital market from an economic development perspective	59
3.3 Business angels.....	60
3.3.1. The stereotype of an angel investor	62
3.3.2. Main types and features.....	63
4. Investment process and the value added by business angels	68
4.1 Stages of the investment process.....	68

4.2 The value added contributions by business angels	72
5. The empirical evidence on the impact of informal capital on economic growth	78
5.1 Measurement issues.....	78
5.2 The micro level evidence on the superior performance of business angel backed firms.....	80
5.3 The macro level evidence on the superior performance of business angel backed firms.....	83
6. Conclusions	84
6.1 Microenterprises and new knowledge as the explanatory factors of economic growth	84
6.2 The contribution of business angels on the growth rate of microenterprises and ultimately on national economies	86
6.3 Future research suggestions	87
Figure 1. The private equity sector in Finland from the supply perspective	46
Figure 2. The role of business angels on the firm's development	49
Figure 3. Total amount of capital invested in the United States venture capital market between years 2000-201.....	50
Figure 4. Total amount of venture capital invested by stage of firm development between years 2000 and 2010 in the United States.....	51
Figure 5. The invested amounts in the European venture capital market during years between 2000 and 2009.....	52
Figure 6. The amount of venture capital in relation to GDP in some countries in 2007.....	52
Figure 7. Venture capital financing in start-up and seed stage companies in Finland 1997-2007	55
Figure 8. Venture capital investments in enterprises with different phases of development in 2007 in Finland	56
Figure 9. Market-level early stage venture capital deal flow and realized investments by size (averages 2004-2005).....	58
Figure 10. The effect business angels have on enterprises and economic growth	61
Figure 11. The value added roles and the two major dimensions	77

1. Introduction

1.1 The connection between innovation oriented new enterprises, informal capital and economic growth

During the first three quarters of the last century, a prevailing belief was that economies of scale and scope present in production, distribution, management, and research and development of a firm led to increasing firm size (Carree and Thurik 2005). In addition, the growing but relatively low level of economic development and high price elasticities that were followed by price competition, favored large scale production. Statistical evidence from OECD (Organization for Economic Cooperation and Development) countries clearly shows a tendency towards an increasing presence and role of large firms during that period (Carree and Thurik 2005; Audretsch et al. 2002). Entrepreneurship and small firms on the other hand decreased in importance and number despite they were driving entrepreneurship, income and employment in the first decades of the last century (Audretsch and Thurik 2000; Carree and Thurik 2005). During that time, Schumpeter (1934) wrote *The Theory of Economic Growth* which already then emphasized the importance of entrepreneurship as the prime cause for economic development. Schumpeter argued that new enterprises exploit creative destruction which relates to introducing new innovations and making existing production methods and processes obsolete (Carree and Thurik 2005). Creative destruction is the main characteristic of what has been called the Schumpeter Mark 1 regime, and also nowadays, it is one of the drivers of economic development in the endogenous growth theories.

The main argument in the thesis is that the traditional macroeconomic growth theories that explained growth for most of the last century do not any longer completely capture the essential drivers of economic growth. The thesis proposes that the most essential growth drivers, that are not included in the traditional growth theories, are innovative microenterprises and the utilization of new knowledge. The traditional growth models explain growth with scale economies, international trade and (product) differentiation but also with technological change and productivity. Thus the traditional neoclassical growth theories fail to take into account the growth small microenterprises contribute. In addition, according to literature and empirical evidence, it is widely recognized that much of the economic growth cannot be explained by the existing theories.

By utilizing new knowledge and transforming it into commercial opportunities, microenterprises grow and employ citizens. With proper financial and professional aid such companies can experience two-figure growth easily, given that the business idea is proper. In absolute terms, such a growth is unsubstantial at economy level, but when the whole small firm sector is taken into account, the contribution to growth and employment could be substantial. In fact, in the future, the microenterprise sector may be the most relevant source of economic growth, if supported properly.

Why is it so important to address economic growth? The financial crises and the economic downturn that followed made national economies to suffer great reduces in the levels of gross domestic product (GDP). In addition, the gross domestic product growth rates have been steadily decreasing also in steady economic conditions in the developed countries. The tendency seems to be clearly towards a low GDP growth era. Also, due to the financial crisis and economic downturn, governments were forced to take on new debt which has to be paid back in the future. In addition, the dependency ratio is getting worse: in the near future, the amount of Finnish nationals that are retired will be larger than the amount of Finnish nationals that belong to the working group. The concerns about the Finnish welfare state and economic growth are distinct. It is important to be able to correctly measure economic growth and its drivers. Without a thorough understanding of the factors that create growth, it is impossible to support growth and in worst case, policy implication could unintentionally disrupt and prevent the growth drivers from acting favorably and in even worst case, altogether.

The macroeconomic theories have already been modified to better describe national growth. For example Audretsch and Thurik (2004) introduced two broad concepts of economic organization: Managed and Entrepreneurial Economies. The researchers proposed that the economic dimension were no longer dominated by scale economies and large companies but by entrepreneurship, which is driven by knowledge, technology, innovations and opportunities. Managed Economy theories and the whole viewpoint flourished for most of the last century while Entrepreneurial Economy emerged when it was finally noted that the assumptions behind Managed Economy approach did no longer hold for the changed circumstances prevailing in today's reality.

There is vast amount of literature pointing the connection between entrepreneurship and economic growth. For example Engel (2002) researched a series of studies which ultimately affirmed a statistical regularity between various measures of entrepreneurial activity, most typically startup rates, and economic growth. Similar arguments are presented also in Finland. As stated by the Confederation of

Finnish Industries (2008), it is essential for the growth and development of national economies that there are firms which expand, regenerate and employ citizens. Through these activities enterprises create welfare both in a firm and a national level. Nations' dynamics need innovations and productivity, that is growth enterprises.

The increased importance of young enterprises creates also problems: they cannot grow without capital. Such enterprises do not have unutilized capital since they are so small and young, at the startup or seed stage, that they cannot possibly have acquired capital by themselves. The business is only starting, in many cases there are just narrow income streams and no physical or financial assets that would secure bank loans. Formal venture capitalists and institutions as well the traditional lenders, commercial banks, do not invest in such a small companies. Also the young enterprises are so risky that the investors have to be prepared to lose everything they have invested. Neither bank nor formal venture capitalist will accept that. So there seems to be an insuperable problem: an enterprise that seeks growth and has the potential to grow cannot do it since there seems to be no institution that would lend the necessary capital for the enterprise to grow. Except for one: business angels.

Business angels are high net worth individuals (HNWI). They have a history as entrepreneurs or former high end managers in large companies. Through successful business lives, business angels have earned enormously wealth. They are prepared and willing to invest in those small risky enterprises. As former entrepreneurs or successful managers, they want to help the younger generations of entrepreneurs to achieve what they have achieved, and they are also prepared to carry the risks the investments bring. Usually business angels invest both capital and time, and they require a share of the enterprise in return. Business angels are often found from formal positions in management teams or in boards of directors in the investee enterprises.

As the thesis will argue, business angels are the main source of capital for growing microenterprises. In the thesis the argument will be made that without business angel financing, many potential growth companies would not be able to exercise their full potential in creating economic growth.

In addition to investing capital, business angels contribute their accumulated human and social capital. Entrepreneurs are often former engineers, scientists or other suchlike employees that have had access to firm specific new knowledge. When such an individual establishes an own firm he lacks numerous competencies. These include management, finance, sales and marketing, distribution and network of

connections, among others. Due to the characteristics of business angels and the value adding contributions they perform, business angels are able to provide the entrepreneur such knowledge and connection they are short of. In fact, the involvement of an angel investor with the enterprise contributes to higher growth rate at the firm level, and it can be argued, that also at the economy level.

1.2 Research problem and the frame of reference

The objective of the thesis is to propose that the traditional growth theories fail to explain economic growth in its entirety. The argument is made that innovative microenterprises that utilize new knowledge are the growth drivers today and that they are not included in the traditional growth models. The objective is also to propose that growing microenterprises are short of necessary growth capital and that business angels are often the only institution that provides them capital. In addition, the thesis argues that by both providing capital and time business angels contribute to higher firm growth rates.

The thesis is a literature survey by its nature since there will be no empirical part. The argumentation is based partly on comparative analysis. In the second chapter, the evaluation of the macroeconomic theories is based on empirical results concerning the economic growth drivers and mechanisms proposed by literature and empirical research. The rest of the thesis is based on comparative analysis.

The preference for anonymity by business angels creates some short falls in research in the area. Empirical studies concentrating on the economic impact business angels have are limited, since there is no means by to which identify either firms that receive angel financing or the business angels themselves. Business angels do not need to identify themselves or publicly announce their activities. Also, research in the field is young and the theoretical modeling of business angel investment process as well the frame of reference lacks altogether. Due to the preceding argumentation, it is out of the scope of the thesis to conduct empirical research on the micro and macro level effects business angels have.

1.3 The structure of the thesis

The thesis is organized as follows. The second chapter discusses and presents the neoclassical growth theory by Solow as well the more modern theory of endogenous growth. As will be argued in the chapter, the basic endogenous growth theory does not explain economic growth properly, since entrepreneurship is not build in the model. Thus the second chapter ends with a presentation of the endogenous growth theory of entrepreneurship which is a modification of the basic endogenous growth

theory. In the second chapter, some important concepts that closely relate to the growth drivers today are also discussed.

The third section introduces growth enterprises themselves and clearly presents their need for growth capital. In the section I will also demonstrate the venture capital markets in Europe and Finland. In addition, the third chapter presents business angel operations in the venture capital market and clearly demonstrates how the informal venture capitalists are the main capital providers for microenterprises. The third chapter concludes with a thorough presentation of the business angels themselves.

In the fourth chapter, business angel investment process is briefly discussed. More attention is directed to the presentation of the value adding roles that literature suggests business angels are performing. The fifth chapter presents micro and macro level empirical evidence that such enterprises that are financed with either business angel capital or formal venture capital experience higher growth rates than similar enterprises financed by any other institution, measured with almost any relevant meter.

The sixth section presents a summary of the relevant results proposed in the thesis.

1.4 Key concepts

Entrepreneurship: Entrepreneurship is the manifested ability and willingness of individuals, on their own or in teams, within or outside existing organizations, to perceive and create new economic opportunities, whether they are new products or production methods, new organizational themes or product market combinations. They introduce their ideas in the market, in the face of uncertainty and other obstacles, by making decisions on locations and the use of resources and institutions (definition inspired by Hébert and Link 1989; Bull and Willard 1993; Lumpkin and Dess 1996 and presented by Wennekers and Thurik 1999, among many others).

A growth enterprise: An enterprise is defined as a growth company if the annual growth rate is at least 10%. Usually the growth figures are measured from turnover and from the total number of employees.

Microenterprise: An enterprise that employs less than 10 people.

When the microenterprises are discussed in the thesis, the objective is to include in the discussion such companies that are innovative, growing and technology oriented. Such enterprises create dynamics in

economies and they exploit new knowledge and innovations which ultimately create new enterprises and thus economic growth.

Seed stage enterprise: A company is defined to be at the seed stage when there exists just the business idea but it is not exactly commercialized yet. The idea is being developed and researched further as well sized up.

Startup enterprise: A startup company concentrates on product development and premarketing. The products or services are not yet sold and thus the company is not creating profits.

Expansion stage enterprise: At this stage a company is already established and has internal financing. Products and/or services are sold, the company may or may not be profitable and it requires capital to grow and expand.

Business angel: Business angel is an individual who acts alone or in a formal or informal syndicate and invests his own money directly in an unquoted business in which there is no family connection. After making the investment, business angel often takes an active involvement in the business by for example acting as an advisor or a member in the board of directors. Business angels are high net worth individuals and thus they have sufficiently disposable wealth to make such high risk investments.

Formal and informal capital market: Informal capital market consists of business angels and friends and family investors (some studies do not include friends and family in this definition). Informal venture capitalists operate in informal capital market and an overarching feature is that they invest their own money, whether earned or inherited. All the other financial intermediaries that provide private equity financing, such as venture capital funds, banks and insurance companies, make up the formal venture capital market. A distinguishing feature is that formal venture capitalists invest third party money, that is capital not their own.

Endogenous growth theory: The endogenous growth theory is built on some of the assumptions determining neoclassical growth models. The theory differs from the neoclassical theories by the assumption that knowledge is produced in firms as any other good and is thus endogenously modeled. The endogenous growth theory assumes that new knowledge produced in incumbent enterprises spills over automatically and all firms in a specified geographical area can utilize it.

Endogenous growth theory of entrepreneurship: The endogenous growth theory of entrepreneurship differs from the basic theory of endogenous growth by many aspects but the most important is the assumption that knowledge creates entrepreneurial opportunities. The preceding argument is based on the assumption that entrepreneurship is an endogenous response to the incomplete commercialization of new knowledge and thus without entrepreneurship, much of new knowledge would be wasted. As a consequence one of the founding assumptions is that in societies there has to be economic agents that take advantage of new knowledge, commercialize it and profit from it. The model also assumes that there is a country (or region) specific knowledge filter which determines the country's ability to utilize the produced knowledge.

2. The connection between entrepreneurship and economic growth

In this chapter I give a brief presentation of the neoclassical growth theories. I will make the arguments that propose why these theories fail to capture economic growth today, especially in developed countries. The chapter continues with a thorough presentation of the more representative theory: the theory of endogenous growth. Nevertheless the theory is advancement from the neoclassical growth theories, empirical evidence proposes that the basic endogenous growth theory fails to take into account the growth drivers, entrepreneurs. According to empirical evidence, the endogenous growth theory does not explain the witnessed growth in nations and for that reason modified models are emerging. In the thesis, I present the endogenous growth theory of entrepreneurship.

Before the actual presentation of the growth theories is given, I discuss some important concepts.

2.1 From Managed Economy to Entrepreneurial Economy

Audretsch and Thurik (2001 and 2004) among others, present the concepts of *Managed* and *Entrepreneurial Economies*. According to the researchers, *Managed Economy* flourished for most of the last century. The outputs consisted mainly of manufactured products and the inputs of traditional production factors: labor, capital and land. A number of studies indicate that assumptions and theories defining Managed Economy conditions did no longer correspond to the real conditions in the late 20th century. Academics noticed that there had been changes in the economic environment, such as the information and communication technology (ICT) revolution, and globalization. Also the academics found that in the countries belonging to the Organization for Economic Cooperation and Development

(OECD), there has been a structural shift from large companies competing through mass production, product differentiation and economies of scale towards smaller companies relying on knowledge, initiative and flexibility. Thus the OECD countries went through a transition from Managed to Entrepreneurial Economy between mid-1970 and the early 1990s (Acs 1996 & 1999, Acs and Audretsch, 2001, Audretsch and Thurik 2001, Karlsson et al. 2004, Verheul et al. 2003, among others).

Audretsch and Thurik (2001, 2004) noted that in the last twenty years of the 20th century, the joint effect of globalization and the information and communication technology revolution extremely reduced the cost of shifting both capital and information out of the high cost locations of Europe and the United States into low-cost locations around the world. Routinized tasks that had been performed in high-cost locations were no longer compatible with the low-cost locations especially in East-Asian and South-American countries. According to the researchers, as a result, in high-cost locations the comparative advantage shifted to knowledge-based activities that cannot be transferred around the world without a significant cost.

Knowledge as an input in production is inherently different from the more traditional inputs: land, capital and labor. Knowledge is characterized by high uncertainty, high asymmetries across people and it is expensive to transact. The response to a trend that proposed knowledge to be the main source of comparative advantage is the *Entrepreneurial Economy* (Audretsch and Thurik 2001, 2004).

According to Audretsch and Thurik (2001, 2004), the model of Entrepreneurial Economy is based on elements such as flexibility, turbulence, diversity, creativity and novelty, and new forms of linkages and clustering. Both the Managed Economy and the Entrepreneurial Economy models explain economic growth, but the foundations for the growth vary substantially between the two. In the Managed Economy, economies experience growth through stability, specialization, homogeneity, scale, certainty and predictably. On the contrary, the above mentioned elements, flexibility, turbulence, diversity, novelty, innovation, linkages and clustering drive growth in the Entrepreneurial Economy model (Audretsch and Thurik, 2004).

Thus as a result, the two models are extremely different. One fundamental difference is the treatment of entrepreneurship. According to Thurik (2007), an important distinction is that under the model of Managed Economy, firm failure is viewed negatively and it represents a drain on society's resources. Also in the model, resources are not invested in high-risk ventures. On the contrary, in the

Entrepreneurial Economy firm failure is seen as an experiment, an attempt to walk into a new direction in an inherently risky environment (Wennekers and Thurik, 1999). Thus the process of searching for new ideas is accompanied by failure. The researchers propose that an externality of failure is learning which should be anything but negative feature, as viewed in Managed Economy. In a similar fashion, the virtues of long-term relationships, stability and continuity under the model of the Managed Economy change to flexibility, change, and turbulence in the model of Entrepreneurial Economy. A liability in Managed Economy is, in some cases, a virtue in Entrepreneurial Economy (Thurik 2007).

To sum up, the neoclassical growth theories that will be discussed below represent and are related to Managed Economy. The growth drivers in the neoclassical models are scale economies, mass production and product differentiation, all which actually grew economies in the last century. However, the world and economies are changed, and today the growth drivers are much different. As discussed above, innovation, change, flexibility and turbulence can be viewed as the growth factors today and those are not the virtues Managed Economy theories take advantage of. Thus the defining assumptions of the theory depict wrong reality. The building blocks of the Entrepreneurial Economy model make it representative for the current economic conditions. Also the depicted growth drivers are such elements that are usually related to entrepreneurship. Thus it can be argued that the endogenous growth theories that take into account entrepreneurship represent the Entrepreneurial Economy model.

2.2 Entrepreneurship

2.2.1 The definition of entrepreneurship

The reintroduction of entrepreneurship into mainstream economics was made by Baumol in 1968. Since the reintroduction, the role and importance of entrepreneurship in the research on economic growth has increased.

Carree and Thurik (2002) define entrepreneurship essentially as a behavioral characteristic of a person. Entrepreneurship is not an occupation and entrepreneurs are not a well-defined occupational class of persons (Carree and Thurik, 2002). Following Hébert and Link (1989), Bull and Willard (1993), Wennekers and Thurik (1999) and Lumpkin and Dess (1996), Carree and Thurik (2002) give the following definition for entrepreneurship:

“Entrepreneurship is the manifested ability and willingness of individuals, on their own, in teams, within and outside existing organizations to perceive and create new economic opportunities (new products, new production methods, new organizational schemes and new product-market combinations), and to introduce their ideas in the market, in the face of uncertainty and other obstacles, by making decisions on location, form and the use of resources and institutions”.

There are three entrepreneurial roles that define entrepreneurship. They were emphasized by Schumpeter, Kirzner and Knight (Carree and Thurik 2002, among many others). First is the role of innovator that especially Schumpeter used to draw in discussion. Originally depicted by Schumpeter “new combinations we call enterprise; the individuals whose function it is to carry them out we call entrepreneurs” (Schumpeter 1934; 74). The second role addresses pursuing profit opportunities: entrepreneurs combine resources to fulfill currently unsatisfied needs or to improve market inefficiencies or deficiencies. Carree and Thurik (2002) label the role as Kirznerian entrepreneurship. For the third, there is the role that assumes risk associated with uncertainty (Carree and Thurik, 2002, label it as Knightian entrepreneurship). Carree and Thurik (2002) argue that if a person introduces a new product or starts a new enterprise it can be interpreted as an entrepreneurial act in terms of all the three roles: the person is an innovator who has perceived a profit opportunity which has been unnoticed until now and he takes the risk that the new venture or product is a failure.

Entrepreneurs take advantage of new knowledge and innovations and turn them into new enterprises. As Carree and Thurik (2002) following Lumpkin and Dess (1996) propose, management literature takes a broad view on entry. The management literature states that new entry can be accomplished by entering new or established markets with new or existing goods and services. For entrepreneurs to create growth they cannot mimic smallness (Carree and Thurik 2002), that is entrepreneurs have to launch a new venture; a new startup firm that takes advantage of new innovations. These are essential definitions for the below discussed endogenous growth theory of entrepreneurship and for the whole thesis.

2.2.2 Causes for the birth of new enterprises

Audretsch et al. (2006) identify new knowledge and ideas as the source of entrepreneurship. They propose that new ideas and knowledge are created in one context and used in another. In practice, this could mean that incumbent firms create knowledge by investing in research and development but are either unable or unwilling to commercialize the new information. Audretsch et al. (2006) argue that the mechanism for recognizing new opportunities and actually implementing them by starting a new firm

involves knowledge spillovers. The organization that creates the new knowledge is not the same firm that commercializes it and actually profits from it: it is the new firm.

Second factor that generates new enterprises is entrepreneurship capital. The more there are enterprises the more there is competition. According to Thurik (2007), competition advances knowledge externalities more than local monopolies. He argues that local competition does not however refer to competition within product markets as traditionally proposed by the industrial organization literature. Rather the competition refers to new ideas embodied in persons. The increasing amount of firms and the diversity among them enhances competition for new ideas. Greater competition across firms facilitates the entry of new firms that specialize in a particular new product niche and then increase the variety of firms in a specific geographic area. Empirical evidence supports the hypothesis that an increase in the competition within a city, as measured by the number of enterprises, is accompanied by higher growth performance of that city (Glaeser et al. 1992 and Feldman and Audretsch, 1999). Also there has been a series of theoretical arguments suggesting that the degree of diversity, as opposed to homogeneity, will influence the growth potential of a geographic environment.

The third factor is private equity. Popov and Roosenboom (2009) argue that there are two main mechanisms by which private equity should lead to greater amounts of new enterprises. First, potential entrepreneurs may anticipate the future need for capital (an entrepreneur anticipates that the firm will for example grow in the future). Thus, potential entrepreneurs establish firms only if they are reasonably sure that they will obtain financing also in the future.

For the second, firms may be engaged in *entrepreneurial spawning*: former employees of publicly traded companies start their own businesses. According to Popov and Roosenboom (2009), large, established firms are incapable of adopting radical new technologies since they would disrupt the established way of organizing business. Stein (2002) on the other hand argues that firms are unable to evaluate new disruptive technologies since they do not relate directly to the current business. The adoption of new technology could also lead to a decline in the productivity of the existing business. Thus the employees of large firms' value new technologies and knowledge more than the incumbent companies that have produced them. Employees may then decide to quit and establish own firms to utilize the new inventions. Thus there has to be proper amounts of private equity available in the markets for the former employees to acquire in order to be able start their own businesses.

The above discussed factors can be bounded together. Knowledge that is created in incumbent firms is not utilized completely and thus there exists loose unexploited information. The unexploited information creates niches in the markets and new enterprises are established to take use of it. The number of firms is increased and the competition tightened in specific product markets or geographical areas.

2.2.3 Economic knowledge

Audretsch et al. (2006) propose that knowledge has some important properties. It is non-excludable and non-rivalry. As a factor of production, knowledge is different from physical capital and labor. The impact knowledge has on economic growth is endogenous in the endogenous growth theories discussed below compared to the exogenous impact in for example the neoclassical growth theory also discussed later on. The marginal productivity of knowledge does not diminish as it becomes available to more users and thus growth can go on indefinitely (Audretsch et al. 2006).

Another property of knowledge is that some of it is not diffused in the economy. All knowledge is not a given or free good at everyone's disposal (Acs et al. 2003). Only a few know about a particular scarcity, a new invention or a particular resource that is not yet being utilized. This is especially true for the knowledge created within firms. Following this discovery, Acs et al. (2003) propose that knowledge is idiosyncratic because it is acquired through individuals' circumstances that include occupation, on-the-job routines, social relationships and daily life.

Acs et al. (2003) define the term economic knowledge (also called capitalized knowledge) as knowledge that is produced by incumbent firms, universities and other knowledge producing institutions and is of value for economical purposes. Economically relevant knowledge differs from the other types of knowledge by its importance in creating economic growth and opportunities.

Economically relevant knowledge obviously and in many aspects differs from traditional knowledge. The economic agents take advantage of the rare factor of production and turn it into financial gain. The channel by how it is utilized is always unique and ranges from new technologies, production methods, products, variations in existing products and so on (Acs et al. 2003).

2.2.4. The lack of entrepreneurship and its effects on economic growth

In this section I briefly present a microeconomic perspective how the lack of entrepreneurship affects economic growth. In coming sections macroeconomic theories concerning the same matter are discussed.

According to Carree and Thurik (2002), a simple microeconomic model depicts the crucial factors leading from entrepreneurship to economic growth. A fundamental assumption is that entrepreneurs share the above discussed Kirznerian and Knightian roles.

By assuming two local markets (i and j), a homogenous good, price elasticity equal to unity and a Cournot oligopoly¹, it can be proven that the lack of Kirznerian and Knightian entrepreneurship leads to lower output. The equations determining the model are:

$$Q_x = a_x/p_x \quad \pi_x = (p_x - \beta)q_x - \alpha \quad q_x = Q_x/N_x \quad x \in \{i, j\}$$

Q_x is the total demand by consumers, π_x the profit maximizing function (β depicts variable costs and α fixed costs, both are assumed to be identical across firms) and q_x is the function depicting the output levels per firm. The cost functions are assumed to be identical across firms and thus also the output functions are identical. Let's assume there are N_x firms in market x. Then the equilibrium market price, Cournot equilibrium output and equilibrium profit function are, respectively

$$p_x = \beta \frac{N_x}{N_x - 1} \quad x \in \{i, j\} \quad Q_x = \frac{a_x N_x - 1}{\beta N_x} \quad \pi_x = \frac{BQ_x}{N_x(N_x - 1)} - \alpha = \frac{a_x}{N_x^2} - \alpha$$

There is equilibrium across regions if entrepreneurs in both regions earn same profits. The equilibrium condition is important since it assures maximum total output for the two markets given a certain fixed number of entrepreneurs, N.

The combined output is

$$Q_i + Q_j = \left(a_i \frac{N_i - 1}{N_i} + a_j \frac{N - N_i - 1}{N - N_i} \right) / \beta$$

¹Cournot oligopoly assumes that the enterprises decide the production amounts simultaneously so that they do not take into account the reactions by competitors when changing the output level q_x . The equilibrium price is then not decided by the entrepreneurs themselves but rather is determined in the market.

In the basic model, there exists a critical profit level, π^* , that the entrepreneurs seek in order to receive a certain level of compensation for their efforts. It is assumed that if the profit level decreases below the critical level entrepreneurs will exit the market until the profit level reaches the critical level again. Also, if the profit level exceeds the critical level, more entrepreneurs will enter the market and the increased competition will eventually push the profit level back to the critical level. According to Carree and Thurik (2002), an important determinant of the critical profit level is the compensation entrepreneurs demand for the risk they face.

For the presentation to yield useful results, the following is assumed. In one of the local markets, i or j , there are too many entrepreneurs and correspondingly, in the remaining local market there are too few entrepreneurs. It follows that the combined output is not at the optimal level. The entrepreneurs are not alert to the prevailing market conditions and there is lack of Kirznerian entrepreneurship (the entrepreneurs are not actively pursuing profit opportunities).

Also increases in the risk aversion lead to an output loss. The increase in risk aversion culminates ultimately to the critical profit level, π^* . An increase in the required profit level leads to a reduction of enterprises in the market and thus also to a reduction in total output. If risk aversion is increased, it means that fewer individuals are prepared to take risks in the market place and there is lack of Knightian entrepreneurs (Carree and Thurik 2002)².

The rest of the section is organized as follows. First a seminal theory of economic growth is presented shortly: the neoclassical growth theory by Solow³. The endogenous growth theory concludes the chapter.

2.3 Neoclassical theory of economic growth

Acs et al. (2003) define the neoclassical growth model by Solow as follows. In the Solow model, an aggregate production function (Cobb-Douglas production function) is assumed to exhibit the basic properties such as constant returns to scale and substitutability among factors of production. The

² The assumptions about risk aversion in markets ultimately lead discussion to the choice between employment and entrepreneurship.

³ Sometimes referred to as Solow-Swan growth theory. The original paper by Solow (1956) is called "A Contribution to the Theory of Economic Growth" and by Swan (1956) "Economic Growth and Capital Accumulation". Both can be found also from references.

factors of production in the basic model are (unskilled) labor (L) and capital (K). K and L are assumed to exhibit decreasing returns to scale.

$$Y = K^\alpha L^{1-\alpha} \quad 0 < \alpha < 1$$

Savings are channeled into increasing the capital base in an economy: as long as capital growth rate is higher than capital depreciation rate capital accumulates. However, the marginal productivity of capital decreases the more there is capital in an economy. Also, if the capital accumulation rate is higher than the population growth rate, capital intensity increases (K/L). Capital accumulation (per person) can be presented with the following equation:

$$\dot{k} = sk^\alpha - (n + \delta)k$$

s is the savings rate, n depicts population growth rate and δ is the depreciation rate of capital.

When investments reach the level that just covers depreciation and the amount of capital that that is needed to fulfill the capital need of the increased labor supply, capital per person is constant (K/L). Solow proposed that an economy adjusts into a long-term equilibrium (steady state), where aggregate production and capital accumulation grow at a rate determined by the growth rate of population.

At the steady state the following equation holds:

$$y^* = \left(\frac{s}{n+\delta} \right)^{\frac{1}{1-\alpha}}$$

From this it follows that in the steady state, an increase in the savings rate s increases the steady state income per capita, since $\frac{dy^*}{ds} > 0$. Thus in the short-run, economic growth can be only enhanced by encouraging savings. However, the impact ceases in the long-run since the marginal productivity of capital decreases and the economy adjusts back to its steady state growth rate.

The model also predicts that increases in the capital depreciation rate and in the population growth rate decrease the per capita income since $\frac{dy^*}{dn} < 0$ and $\frac{dy^*}{d\delta} < 0$. At the aggregate level, similar results can be drawn: increases in the savings rate increase steady state aggregate income and increases in the capital depreciation rate will decrease the aggregate income. As proposed above, at the aggregate level, increases in the population growth rate will increase the aggregate income.

Already Solow himself noted that the model did not account for the historical growth and he continued to develop it. Solow added another variable in the equation. He introduced technological progress which became to known as Solow's technical residual.

The model now assumes that output is a function of capital and effective labor (AL). By enhancing the production technology, more output can be achieved with a given level of the other production factors (K, L).

The production function can be written as:

$$Y = F(K, L) = K^\alpha A(t)L^{1-\alpha}$$

$A(t)$ is an exogenous variable. In the Solow model, technology is assumed to be public good freely available to everyone. The assumption leads to the following result: every firm may use the newest technology without affecting the possibility for all the other firms to utilize that knowledge also. Technology is assumed to grow at the following constant growth rate.

$$\frac{\dot{A}}{A} = g \Leftrightarrow A_1 = A_0 e^{gt}$$

g depicts the technological growth rate. The difference between the modified Solow model and the basic Solow model is that, in the modified Solow model aggregate production grows with the same rate as productive labor compared to the pure growth rate of population in the basic model. Thus, in the modified Solow model economy grows at the same rate as technology g (Kilponen and Santavirta 2002).

A point to be mentioned is that the Solow model does not include entrepreneur as it could be misinterpreted by the notion of knowledge. Karlsson et al. (2004) argue that knowledge and effective labor are incompletely defined in the model, and thus they can be related to various factors that then contribute to economic growth.

Despite the progress made in modeling neoclassical growth theories, most part of the witnessed economic growth was still determined exogenously and not captured by models. Also, the mechanisms that create technological progress and knowledge accumulation remained unspecified. The most promising models, according to Acs et al. (2003), were presented by Arrow (1962) and Sheshinski (1967). They suggested that learning-by-doing is an important by-product of production that ultimately

diffuses into whole economy. Nevertheless, Acs et al. (2003) argue that even these models were not completely integrated into growth context. However, knowledge as a means of economic growth was presented and it started to gain success as the explanatory variable instead of growth in population and in the traditional exogenously modeled technological variable.

The traditional growth drivers, capital, population and technical progress, can be the sources of economic growth even today in the developing nations where much of the population is unemployed, scale economies are not exploited in their full potential and such countries are just catching the developed nations in technological progress. The situation is not the same for developed countries, and thus alternatives for the traditional growth drivers have to be presented. As Karlsson et al. (2004) noted, in his research Steele (2000) raised criticism against the traditional theoretical approaches to economic growth. He questioned the underlying neoclassical assumptions of a social equilibrium and individual optimization and instead argued, that economic growth is related to market disequilibria with entrepreneurship functioning as an equilibrating process. Thus knowledge that entrepreneurs utilize in their process of pursuing opportunities and establishing new enterprises is seen as the growth driver today and the models that try to capture growth have to explain growth with the utilization of knowledge.

Technological progress and new knowledge are in some extent related to each other: new knowledge obviously can create enhancements in technology and even whole new technologies, which then affect national growth. In the traditional growth theories, technological progress was seen as the growth driver but today the ultimate source of growth is new knowledge. Thus, just the source of economic growth has changed to new knowledge, technology as a growth mechanism still exists. Technology is still a vehicle but new knowledge is the source.

2.4 The theory of endogenous growth

Since the last decade of the 20th century, small and particularly new businesses have been the force driving entrepreneurship. In addition, recent econometric evidence suggests that entrepreneurship is a vital determinant of economic growth (Audretsch and Fritsch, 2002; Audretsch and Keilbach, 2004; Karlsson et al. 2004; Thurik 2007; Thurik, Carree, van Stel and Audretsch 2008). According to Thurik (2007) and Audretsch, Carree, van Stel and Thurik (2002) a vice versa situation exists: the lack of entrepreneurship leads to reduced economic growth (as seen from the example in section 2.2.4).

Moreover, Carree and Thurik (2003) argue that the positive link between entrepreneurship and economic growth has been verified across all observation units, which include the establishment, the enterprise, the industry, the region and the country. Wong et al. (2005) among others suggest further that precisely fast growing new enterprises account for most of the new job creation, not new enterprises in general.

Acs et al. (2003) present empirical support for the link between new enterprises and economic growth. According to the researchers, a series of recent studies have confirmed a statistical regularity between various measures of entrepreneurial activity, most typically startup rates, and economic growth. In another study by Acs (2002), he examines the relationship between startup rates and economic growth for 348 United States regions in the 1990s. He found plausible evidence that confirms the positive relations between startup rates and regional growth rates. The statistical relationship between entrepreneurship and growth was stronger than the relationship between economic growth and any other regional characteristic, such as human capital, income levels and population growth. Similar results have been confirmed in numerous studies, including Acs (2003), Dejardin (2000) and Reynolds (1999), among others.

Empirical evidence is found also in other countries. Fölster (2000) examines not just the employment impact within new and small firms but the overall link between increases in self-employment and total employment in Sweden during 1976–1995. Hart and Hanvey (1995) link measures of new and small firms to employment generation in the late 1980s England. They found that employment creation came largely from small and medium sized enterprises. Callejon and Segarra (1999) studied the link in Spain and also confirmed the findings of other researchers. A study made of 23 OECD (Organization for Economic Cooperation and Development) countries provides empirical evidence from a 1984–1994 cross-sectional study. According to the research, increased entrepreneurship, as measured by business ownership rates, is associated with higher rates of employment growth at the country level. Similarly, Audretsch et al. (2002) and Carree and Thurik (1999) found that such OECD countries that exhibited higher increases in entrepreneurship also experienced greater rates of growth and lower levels of unemployment.

Romer (1986, 1980) and Lucas (1988) made seminal contributions to the endogenous growth theory. According to Acs et al. (2003), the economists endogenized knowledge production within economies. As

a consequence, economic growth was begun to be seen as the result of the purposeful creation of knowledge.

In Romer (1986), firms' investments in research and development (R&D) create factor accumulation. The decision to invest in knowledge production is based on temporary monopolistic market power, expected gains and market cost of additional R&D as well as on imperfect copyright and patent laws that cause knowledge spillovers. According to the endogenous growth theory, there are diminishing returns to investments in R&D. The diminishing returns are compensated by the spillovers of knowledge, since the spillovers increase the whole knowledge base at the economy level (Fingleton 2002).

In addition to above, Romer (1986) assumed that the stock of R&D workers is the main determinant of the rate at which knowledge grows. The Romerian framework of technological progress thus concentrates on the accumulation of knowledge stock. The traditional assumptions then just propose that economic growth pours forth from new technological innovations the R&D workers create. There is totally missing the relation of new knowledge and economic growth. As will be discussed later on in the chapter, the mechanism that relates new knowledge and economic growth to each other, that is knowledge filter and spillovers as well as entrepreneurs seeking for windows of opportunities, are missing from the picture. The deficiency is corrected by altering the basic endogenous growth theory by introducing entrepreneurship in the model.

Lucas (1988) assumed that each R&D worker has a unique set of knowledge in a particular technology area. The consequences of the assumption Lucas (1988) made are extremely acceptable. It stresses that learning and understanding knowledge is very expensive and that each knowledge worker has a limited capacity to learn, use and understand knowledge. These kinds of arguments are easy to relate from theory to the real world.

2.4.1. The basic structure of the endogenous growth model

Endogenous growth model has its grounds in the above discussed neoclassical growth model (especially the AK-models are proposed as the basis for the endogenous growth theory). Some of the basic assumptions are thus valid also in the endogenous growth model.

According to Acs et al. (2003), the basic structure of the model proposes that knowledge is produced in profit-maximizing firms as any other good. Thus the production of knowledge is assumed to be

endogenous. Endogenous knowledge production affects growth by two main mechanisms. First, knowledge aids companies run their businesses more efficiently. Second, since knowledge spills over across firms also other economic agents, for example new entrepreneurs, can take advantage of the spilled over new knowledge. This shifts the production function of every firm in the economy upwards resulting in more production with the same amounts of other production factors (capital and labor). Both of the effects increase firm level productivity.

In the following I briefly present the micro foundation and assumptions of the endogenous growth theory proposed by Acs et al. (2003). According to the researchers, the unmodified model does not depict reality, as will be seen from the argumentation below, and some modifications on the assumptions have to be made. Thus the below presentation is already a slightly modified version of the basic endogenous growth theory. I will not present the characteristics of the unmodified endogenous growth theory, some of them are discussed right above (in the section that describes the neoclassical theory) and also below together with the presentation of the modifications. As will be argued, even the modified version of the endogenous growth theory is insufficient to explain economic growth and the presentation will slowly be directed to the endogenous growth theory of entrepreneurship which better captures economic growth drivers.

According to Acs et al. (2003), the knowledge-based growth models have three cornerstones: spatially constrained externalities, increasing returns in the production of goods and decreasing returns in the production of knowledge. The cornerstones rely on assumptions related to technology, firm characteristics, the spatial dimension and knowledge.

The assumptions on technology

The production of knowledge exhibits diminishing returns to scale. Hence, doubling the inputs to research will not double the amount of knowledge produced. The assumption on diminishing returns to technology suggests that an optimum growth rate of technology exists. According to Acs et al. (2003), the result is an upper bound of knowledge that is the highest amount of knowledge that can be attained.

The produced knowledge can be used in the production of goods. The production of goods is characterized by increasing returns to scale associated with increasing marginal productivity of

knowledge, holding all other inputs constant. The growth rates of goods production can increase monotonically over time but the increase in the rate of growth is constrained by the decreasing returns to scale in knowledge production. The outcome is a well-specified competitive equilibrium model (Acs et al. 2003).

In a two-period model, the first period's consumption is the difference between exogenously given endowment of consumption goods e_1 and goods that are used to produce the firm specific k_{1i} . Thus consumption and the endowment of consumption goods define the production of knowledge:

$$c_{1i} = e_1 - k_{1i}$$

The firm specific knowledge, k_i is just assumed to exist but it is not explicitly modeled.

In the second period, the knowledge k_i produced in the first period is used as an input in the production of consumption goods. The production function F is assumed to be twice differentiable. In addition to knowledge k_i , it includes a fixed vector x that represents all other factors of production used by the firm. Firms benefit also from knowledge spillovers that all the other firms (n) are generating ($K = \sum_{k=1}^n k_1$), since each individual firm cannot appropriate all the produced knowledge themselves. The production function is

$$F(k_1, x, K) \quad F_1 \geq 0, F_{12} \leq 0, F_2 \geq 0, F_{22} \leq 0, F_3 \geq 0, F_{32} \geq 0$$

The production function has the following properties: it is concave and homogeneous of degree one as a function of k_i and x holding K constant but convex in all arguments. Thus knowledge and all the other factors of production, namely x , exhibit constant returns to scale and the production of knowledge exhibits diminishing returns to scale. The point that makes the production functions useful in the context is that it exhibits increasing returns to scale in all arguments. Thus the production function is assumed to exhibit globally increasing marginal productivity of knowledge (K). The important implication is that the aggregate production function for the whole economy is characterized by increasing returns to k_1 .

The assumptions on companies

A common assumption of general equilibrium models is that each unit of labor is identical for a firm. In endogenous growth models the scale and number of firms are undefined. Firms are assumed to take prices as given which implicitly mean that there are many firms operating in competitive markets and earning zero profits.

The number of firms, entry rates and the scale of operations cannot be determined but the following assumptions are typically imposed: the number of firms is given, no entry occurs and all firms operate at the same level. The assumptions suggest that the number of firms correspond to the number of individuals and that labor growth rate is at the same level as the rate at which individuals vanish from the markets; total labor is constant (Acs et al. 2003).

Audretsch et al. (2003) give a more thorough presentation of the production function (which has the above mentioned characteristics). The below presentation also depicts the similarities between the traditional endogenous growth theory and the Solow model. The production function is:

$$Y = K^\alpha (AL_y)^{1-\alpha},$$

where Y represents total output, K stock of capital, L_y is the labor force dedicated in the production of Y and A is the stock of knowledge capital. The production function is the traditional Cobb-Douglas production function. The capital accumulation function has the usual characteristics Solow (1956) presented:

$$\dot{K} = s_k Y - \delta K,$$

where s_k is the saving rate and δ the rate of capital depreciation, δK being the total amount of capital that depreciates at certain unit of time.

Assumptions on knowledge

As mentioned above, all firms take advantage of the firm-specific knowledge k_i in the production of goods. The produced knowledge is assumed to be in firms forever. Thus Acs et al. (2003) argue that the produced knowledge does not depreciate and if no research is conducted, k_i is constant.

A question that may arise from the claim that firms are symmetric is that why firm-specific knowledge is needed. In addition, as also assumed in the Solow models, if the produced knowledge spills over in its entirety and all the other enterprises in an economy can freely benefit from it, why do entrepreneurs decide to invest in knowledge production? In the Solow models, the question is not solved. On the other hand, in the endogenous models firms are assumed to produce goods differently. In addition, it is necessary to assume that the knowledge firms produce is at some parts firm-specific. If the produced knowledge is entirely identical, spillovers would be direct and comprehensive, as proposed above. Hence, there would be no incentive to invest in knowledge and subsequently no, or at least less growth. Still, Acs et al. (2003) argue that the explanations are not consistent with microeconomic setup.

According to Acs et al. (2003), the aggregated stock of knowledge that generates spillovers to other firms is characterized as an undefined public good. It is available in books among other public sources and every institution and person can access the public part of the privately produced knowledge. The other part of the produced knowledge is firm-specific. It shifts the production function upwards given all the other production factors. The firms-specific knowledge affects all firms similarly.

The above classification of knowledge can be easily approved in comparison with the real world. The perfectly accessible part of produced knowledge can be for example acquired from scientific publications, patent applications and other suchlike public sources. The other part of the produced knowledge is novel and tacit, bound to firms and individuals. Tacit knowledge is sometimes called in the academic literature as *silent knowledge*.

Assumptions of the spatial dimension

According to Acs et al. (2003), a principal assumption of the basic theory of endogenous growth is that the total stock of knowledge (K) is evenly distributed across space. However, as the researchers claim, the assumption does not hold in the literature on geographic knowledge spillovers. The reason is that the most valuable type of knowledge, new technological knowledge, is tacit. Tacitness makes the access to new knowledge geographically bounded: in order to access the new knowledge, one has to be geographically near the place where innovation actually happens.

To sum up, although the endogenous growth models are clear advances in the area of measuring and modeling growth today, there are still parts of growth that are unexplained. Thus the endogenous growth models do not gain much empirical support. Indeed, it is not explained by the model why for example such countries that have high R&D expenditures (Sweden and Japan) have lower gross domestic product (GDP) growth rates than countries with smaller R&D expenditures (Ireland and Denmark)⁴. The deficiency is a consequence from the assumption that knowledge automatically spills over and is transformed into commercial activities. The model does not take into account that there has to be economic agents that search for opportunities, are able to discover new innovations and has the knowhow to transform knowledge into whole new ideas. Thus the fact that technological opportunities exist does not automatically mean that the opportunities are discovered, exploited and commercialized.

It seems that there is a “missing link” in the model. The mechanism that translates knowledge into actual outcomes is not explained by either the basic or the slightly modified endogenous growth model. According to Acs et al. (2003), innovative entry, reorganization and rationalization of existing firms and firm exits need to be integrated into the endogenous growth process in order to reach the interdependency between knowledge, opportunity and commercialization. Knowledge spillover theory of entrepreneurship is closely related to the endogenous growth theory of entrepreneurship and for that reason it is presented before the actual modified endogenous growth theory.

2.4.2 The knowledge spillover theory of entrepreneurship

The traditional approach to entrepreneurship compares different attributes of individuals. Differences in risk aversion, person’s preference to autonomy and self-direction as well as differences in access to scarce resources, such as human, social and financial capital, determine whether an individual will become an entrepreneur. In brief, the traditional theory of entrepreneurship takes the context as given and changes the individual characteristics in order to determine an entrepreneur (Audretsch et al. 2006).

The knowledge spillover theory takes a different stand. According to Audretsch et al. (2006), the knowledge spillover theory holds the individual characteristics constant and by placing the individual into different contexts analyzes how the cognitive process of making the decision to become an entrepreneur is influenced. In particular, the theory compares high knowledge contexts with

⁴ For more information, Acs et al. (2006) present informative studies conducted in OECD countries.

impoverished knowledge contexts. The new approach alters the conception of entrepreneurship. Entrepreneurship is not a phenomenon exogenously determined by personal attributes and family history but an endogenous response to opportunities that are generated by investments in new knowledge (Audretsch et al. 2006).

According to Audretsch et al. (2006), the endogenous response to the incomplete commercialization of new knowledge provides the missing link in recent economic growth models. Without entrepreneurship much of new knowledge would be wasted. Thus as a consequence, entrepreneurship is a mechanism that improves a society's ability to more completely utilize the investments made in new knowledge.

Empirical evidence to support the knowledge spillover theory is provided by Audretsch et al. (2006). The researchers analyzed variations in startup rates across different industries that reflected different knowledge contexts. Empirical analysis clearly showed the connection between high startup rates and a high level of investment in new knowledge. According to the researchers, the result is assumed to support the knowledge spillover theory.

The knowledge spillover theory presents the term *knowledge filter* (Audretsch et al. 2006). The characteristics of new knowledge combined with wide spectrum of institutions, rules and regulations impose the filter. According to Audretsch et al. (2006), knowledge filter creates the opportunity for entrepreneurship. The less permeable the filter the more it creates opportunities since the greater is the difference in valuation of new knowledge by decision-making hierarchies of incumbent firms and other economic agents.

The knowledge spillover theory shifts the attention away from firms to individuals, such as scientists, engineers and other knowledge workers – agents with endowments of new economic knowledge (Audretsch et al. 2006).

The fundamental question is that how can an economic agent with a given endowment of new knowledge best appropriate the returns from that knowledge? According to Audretsch et al. (2006), if a scientist or engineer can pursue new ideas in his workplace where the new knowledge is also created, and roughly appropriate the expected value of that knowledge, he does not have a reason to leave the company. Nevertheless, if he values the idea more than the incumbent firm he may choose to establish own company to appropriate the true value of the new knowledge he is aware of. Audretsch et al.

(2006) argue that the bigger the difference between the valuation of the new knowledge by the incumbent firm and the innovator, the more probable is the establishment of a new firm. However, it is expensive to start an own company. In order for the new knowledge to create new enterprises, the valuation difference has to at least cover the expense of starting an enterprise.

Audretsch et al. (2006) noted that the knowledge spillover theory assumes the knowledge production function to be inverted. The knowledge is exogenous and embodied in a worker, whereas in the traditional theory of entrepreneurship individual characteristics are exogenously given. Audretsch et al. (2006) argue that the knowledge spillover theory is actually a theory of endogenous entrepreneurship, where entrepreneurship is an endogenous response to opportunities created by investments in new knowledge that are not commercialized because of the knowledge filter.

2.4.3 The knowledge filter, entrepreneurship and endogenous growth

In this section I concentrate on the modification made to the endogenous growth theory. By changing some assumptions the model takes into account entrepreneurs. The emphasis of the original endogenous growth models is to explain *why* knowledge impacts growth, not *how*. Thus, less attention is paid to the diffusion or transmission of knowledge, to the mechanism that makes knowledge accessible. Also, there is not enough discussion about the absorptive capacity on the part that receives the new knowledge. Still, these are obviously critical issues in modeling knowledge-based growth.

2.4.3.1 The missing link

New knowledge leads to opportunities. Economic agents such as workers, entrepreneurs and whole incumbent organizations exploit the opportunities commercially. According to Acs et al. (2003), the opportunities new knowledge creates can be expressed as a function of the distribution of knowledge within and between societies. They also claim that the opportunities are not in neat packages ready to be exploited but rather they have to be discovered and packaged. Precisely for that reason the connection between opportunities and entrepreneurs is essential for the model since without that connection opportunities would be left unused.

Acs et al. (2003) noted that knowledge by itself may be a necessary condition for new enterprises to emerge in a growth theory. In order to transform new knowledge into economic knowledge and opportunities requires skills, aptitudes, insights and circumstances that are not uniformly or widely

distributed in the population. Moreover, Acs et al. (2003) argue that empirical findings seem to suggest that the entry of entrepreneurs is an important link between the creation of knowledge and the commercialization of that knowledge, particularly in the early stages when knowledge is still *fluid*.

The argument that entrepreneurs are needed for new knowledge to be transferred into economically relevant knowledge implies that there is a filter between new knowledge and new economically relevant knowledge. So, not only K varies across countries (K can vary across countries since different countries expend different amounts of capital in R&D) but also the transmission capacity varies. In other words, in different countries there are varying amounts of entrepreneurship and entrepreneurial activities. In sum, the more there are entrepreneurs in an economy, the more there is absorptive capacity and also, the more knowledge transforms into economically relevant knowledge: a larger share of new ideas flows through the knowledge filter.

2.4.3.2 The theory of endogenous growth of entrepreneurship

As argued previously, the basic shortcoming of the endogenous growth model is that it fails to recognize that only some part of the produced knowledge (K) is economically useful. Also even economically relevant knowledge (K^c) is not necessarily exploited successfully if transmission links do not exist.

As stated above, the amount of entrepreneurial activity is affected by the thickness of the filter. Two countries with similar degree of knowledge production activities but different filter capacities face unequal amounts of idea flows through the filters. An obvious finding is that the amount of entrepreneurs, the capacity of the knowledge filter and the level of investments in new knowledge all have influence on economic growth.

Another point concerning the productive capacity in nations relate to the fact that economic agents are not evenly distributed across countries. Even if the stock of knowledge is freely available, including both tacit and non-tacit knowledge, individuals' ability to transform knowledge into economic knowledge is not the same for all individuals: the important individual characteristics are not spread evenly across and within countries.

When the knowledge spillover theory of entrepreneurship is introduced alongside with the endogenous growth model, Audretsch et al. (2006) as well as Acs et al. (2003) argue that the knowledge spillover theory of entrepreneurship challenges two fundamental assumptions that implicitly drive the results in

the endogenous growth model. The first is that knowledge is automatically equated with economic knowledge and the second that knowledge is automatically and in its entirety spilled over.

In order to wield the limitations of the above presented endogenous growth model and to specify the nature of the transmission link, some assumptions need to be changed. The below presentation follows Acs et al. (2003).

The assumptions

1. New firms are assumed to be the only mechanism that transmits knowledge (K) into economically relevant knowledge (K^c). K transforms into K^c by spillovers. K^c is exploited in new enterprises, whether the knowledge is new, already existing, scientific knowledge or other kind of knowledge. Learning takes always the form of new enterprise. The conclusion of the assumption is that if there are no startups, whether as genuinely new entities or as new entities within existing firms, there are no spillovers and hence no growth.
2. Every firm presents new innovation. The innovation can be created from new or existing knowledge as well as from a combination of the two. As a consequence, firms are heterogeneous. Heterogeneity does not include only size dimension but all firm characteristics, such as absorptive capacity, strategy, technology, product range and all aspects of performance (profitability, productivity, and so on). New entrants are naturally less experienced than incumbent firms: they often make mistakes, fail and exit. Thus in the new set of assumptions, the turbulence and dynamics entrepreneurs create is taken into account. Also following the preceding argument, a high entry rate is necessary to sustain long-term growth.
3. There are no interregional spillovers, only local. All firms in the specific location are assumed to have equal access to the stock of knowledge. Nevertheless, the success of converting general knowledge into economically useful firm-specific knowledge depends on the absorptive capacity that each firm possesses and hence on firm characteristics. Also both private and public knowledge is subject to spillovers.

The assumption alters the view of knowledge compared to the basic endogenous growth theory: knowledge is not anymore divided into undefined public good and firm-specific knowledge. The model's fine character is that it turns the attention to entrepreneurs and to their abilities to utilize from the common good. Thus it actually compares individuals to each other and their competences to unite the right kind of people to perform the right kinds of tasks.

4. Policy and previous history (path dependence) determines the entrepreneurial "climate" in the form of infrastructure, regulation, attitudes, networks and technology transfer mechanisms among others. Thus the conditions for new entry and knowledge transmission vary across regions.

A simple theoretical framework

The endogenous growth theory of entrepreneurship includes above assumptions as well the knowledge filter. The filter that determines the rate at which the stock of knowledge (K) is converted into economically useful firm-specific knowledge (K^c) has the following characteristic (Acs et al. 2003, Audretsch et al. 2006):

$$0 \leq K^c / K \leq 1$$

According to Acs et al. (2003), there are two conditions that need to be fulfilled for the increasing stock of knowledge to create higher economic growth. Both of the conditions have been presented also by Audretsch et al. (2006) and thus discussed already above. For the first, knowledge has to be economically useful and for the second, there must be entrepreneurs in an economy. If the two conditions are not fulfilled, an increase in stock of knowledge may have no impact on economic growth. Another obvious conclusion is that an economy with smaller knowledge stock may grow at a faster rate because the economy is more endowed with entrepreneurs. This conclusion supports the empirical evidence that some high R&D countries experience slower economic growth compared to countries with lower investments in R&D.

The model Acs et al. (2003) suggests comprises two firms: the incumbent firm and the new enterprise. The incumbent firm (I) has accumulated knowledge throughout its lifetime. The firm specific knowledge can be modeled as follows:

$$k_{ijt}^I = f\left(\int_{t=1}^{\infty} k_{ijt}^I, K\right), \quad \sum_{i,j} k^I = K^I$$

As earlier, k_i depicts the firm-specific knowledge and K depicts the whole knowledge base in a specific region. At each given point in time, firm-specific knowledge of the incumbent firms i in industry j depend on their previous investment in knowledge and the size of K at time t . The already accumulated firm-specific knowledge within incumbent firms has two consequences for the firms' ability to utilize new knowledge spillovers from K . First, the size of accumulated firm specific knowledge defines firms' capacity to absorb new knowledge and second, the degree of firm specificity constrains the absorption of knowledge spillovers. As a conclusion, the consequences are competing.

The second type of firm is the startup company, the new entrepreneur. Startup companies do not have history, and thus they have not accumulated knowledge earlier. New entrepreneurs exploit opportunities arising from aggregate spillovers and the entrepreneur's ability to transform the new knowledge into commercial opportunity is in crucial position.

$$K_{i,t}^S = f(K), \quad \sum_i k^S = K^S$$

K^S in period 1 becomes part of K^I in the subsequent period. The relation between K^S in the previous period and K^I in the current period reflects the presence of entrepreneurship in an economy.

Both types of firms utilize the knowledge spillovers although in different ways. Thus they narrow the gap between total spillovers and the share of those knowledge spillovers that are commercialized. According to Acs et al. (2003), the complete mapping between K^C and K is unrealistic (the complete mapping would require implying perfect information in an unbounded state space). Thus they present following relationships:

$$K^C = K^{CI} + K^{CS}, \text{ where}$$

$$K^{CI} = \theta K \quad \text{and} \quad K^{CS} = \lambda K, \quad 0 \leq \theta \text{ and } \lambda < 1$$

$$K \geq K^C = K^{CI} + K^{CS}$$

$$K^C = (\theta + \lambda)K$$

θ can be thought as the absorptive capacity of incumbent firms and λ as a proxy for entrepreneurship within an economy.

In accordance with the assumptions 1 and 2, the production function presented earlier need to be modified to include also entrepreneurship (λ).

$F(k_i, x, \lambda K)$

Since the entrepreneurial sector is characterized by high entry and exit rates, not only do new firms constantly enter the market but also firms fail and exit as proposed by the endogenous growth theory and proved by empirical evidence. Thus, the term λ should be seen as net entrepreneurship so that it includes also the dynamics in the entrepreneurial sector.

Audretsch et al. (2006) present the modified production function as follows:

$$Y = K^\alpha (\theta_r A)^{(1-\alpha)} L_Y^{(1-\alpha)}$$

In the production function θ_r denotes the realized permeability of the knowledge filter, that is the level of knowledge that is utilized by the startup enterprises $(1-\theta)$. θ_r has the following property: $\theta \leq \theta_r \leq 1$. According to the theory, an increase in the entrepreneurial activity increases also the amount of new knowledge utilized by entrepreneurs. As the endogenous growth theory of entrepreneurship proposes, economies grow as a result of entrepreneurial activities. The following proves the claim.

By deriving the production function with respect to θ_r it can be noticed that economic output, Y , increases with entrepreneurship:

$$\frac{dY}{d\theta_r} = (1 - \alpha) \theta_r^{-\alpha} K^\alpha A^{(1-\alpha)} L_Y^{(1-\alpha)} = \frac{1-\alpha}{\theta_r} Y$$

The result is greater than 0 for all Y and thus Y increases with entrepreneurship.

The R&D – sector is modeled by Audretsch et al. (2006) as follows:

$$A = \bar{\theta} L_A$$

where $\bar{\delta}$ is the discovery rate of new innovations:

$$\bar{\delta} = \delta L_A^{1-\lambda} A^\varphi.$$

L_A denotes the amount of labor devoted in generating new knowledge, λ (diminishing) returns to scale in the R&D – sector and φ is a parameter that expresses the intensity of knowledge spillovers (note that λ in Acs et al. 2003 denote entrepreneurship; thus to avoid confusions I use the notion ρ from now on to denote the returns to scale in the R&D - sector). By inserting the discovery rate of new innovations – equation into the model of R&D –sector, the rate that new knowledge (the rate of endogenous technical change) is created can be obtained

$$A = \delta L_A^\rho A^\varphi.$$

Obviously the stock of labor devoted to R&D-sector as well as the amount of knowledge already existing in the region affects the amounts of knowledge produced. In other words, a worker today is more productive than his counterpart previously because there is more knowledge for the today's worker to take advantage of.

By combining the knowledge accumulation with the assumptions made above, the actual level of new knowledge produced by incumbent firms can be presented as

$$A^c = \theta \delta L_A^\rho A^\varphi.$$

The knowledge production function exhibits similar properties as the knowledge production function presented above. The remaining part, $1 - \theta$, is the opportunity that can be taken on by new firms. It can be denoted as *entrepreneurial opportunities*. Thus,

$$A_{opp} = (1 - \theta)A = (1 - \theta) \delta L_A^\rho A^\varphi.$$

In conclusion, Audretsch et al. (2006) prove empirically such hypothesis correct that connects knowledge filter, spillovers and commercialization of knowledge to economic growth⁵.

Depending to the modified assumptions, the endogenous growth theory of entrepreneurship depicts the growth drivers today in quite an acceptable manner. The essential assumptions; entrepreneurship, new knowledge and firm entry as well the knowledge filter, can all be seen as plausible reflections of reality. One of the finest aspects of the theory is that it does not only try to explain growth with microenterprises and new firms but rather it takes into account in the growth process both the incumbent companies and the new startup and seed stage enterprises. Also current empirical research on economic growth emphasizes that growth comes from the existing enterprises as well from new emerging companies. Empirical support confirms the relevance of the model as a measurement tool and as an illustrator of real economic condition today.

However, there are also some deficiencies in the model which emerge due to the assumption that new enterprises (that is microenterprises) are growth factors. The endogenous growth theory of entrepreneurship does not take into account the decision process of becoming an entrepreneur. It is a revolutionary decision that a current employee has to make when deciding whether to stay employed or not. There are many factors that affect the result of that decision which relate to politics, social and cultural environment as well the overall attitude towards entrepreneurship.

The financial difficulties that the new enterprises face have undoubtedly impact on the economical performance both at the firm and the whole economy level. In the models depicting new enterprises such variable that measures the availability of financing could be very advantageous for the explanatory strength of the model. Thus, new variable could be added in the model: “*f*” that measures the impact financing has on the rate at which new enterprises are born, on the survival of such enterprises and on the growth attributes they have. The next chapter clearly presents the difficulties microenterprises have with receiving capital from outside the organization. Also in the literature, it is proposed in many occasions that the lack of financing restrains the microenterprises from growing. On the other hand, the contribution business angels have on the firm growth rates is substantial. In the below presentation

⁵ *Economic growth hypothesis*: Given a level of knowledge investment and severity of the knowledge filter, higher levels of economic growth should result from greater entrepreneurial activity, since entrepreneurship serves as a mechanism facilitating the spillover and commercialization of knowledge.

support is provided for the argument that financial environment should be taken into account in the growth model.

Microenterprises are seeking investment capital that they need in order to exploit new knowledge and innovations discussed in the current chapter. Without capital entrepreneurs are unable to exploit and commercialize new knowledge which implies that in worst case the entrepreneurial venture does not even get to the startup stage. As a conclusion, a good opportunity to utilize new knowledge by establishing new venture is wasted. Also, the effect that the new enterprise would one day have on employment and economic growth is also thrown away.

The objective of the next chapter is to present that the venture capital market is inefficient. The main result of the chapter is that more financing should be directed to microenterprises and in order to achieve it, there has to be something done in the business angel capital sector.

3. Venture capital and the venture capital market participants

3.1 Venture capital

3.1.1 The definition of venture capital

Venture capital is briefly and up to the point phrased by the Finnish Venture Capital Association (FVCA). Venture capital (VC) implies professional investing in such companies that have potential to increase the value of investments fast. Venture financing differs from other forms of investing by its exit purposes: although investments are made in equity capital, the investor is not an owner of the company and thus he is willing to exit as planned. Other aspect that differentiates venture investments from other forms of investing is that the investor participates in the management and control of the company; the investor brings also his human capital into the firm (FVCA 2002).

According to FVCA (2002), Lumme et al. (1998), and Van Osnabrugge and Robinson (2000), venture capital is divided into formal and informal capital. Formal venture capital is provided in formal, or institutional, venture capital markets which comprise professional investors. The group includes venture capital funds, venture capital companies and institutions. Good examples of venture capitalists from Finland are Tekes, Sitra, Foundation for Finnish Inventions (Keksintösäätiö in Finnish) and Veraventure.

Luukkonen (2008) further divides the formal venture capital sector into two: public and private formal venture capital.

The informal venture capital is provided by business angels and according to some studies, by family members and friends. The nature of the investments made by family members and friends are usually extremely different from business angel investments⁶. Thus academics usually do not include them into the analysis concerning informal investments. I will also exclude them from my analysis and they are rather just mentioned in order for the definition to be precise.

Business angels invest their own money in contrast to formal venture capital institutions that invest capital not their own. The formal venture institutions serve as intermediaries between the providers of capital and the firms acquiring it while business angels invest directly to companies without any go-betweens.

The formal venture capital investors raise capital mainly from public sources such as banks, pension funds and insurance companies, non-financial companies, wealthy families and charitable trusts (FVCA; Mason and Harrison 2008). As discussed in detail in section 3.3, business angels are wealthy individuals that have piled capital throughout their professional careers and in some cases inherited a great amount of wealth.

Informal venture investments are usually made with equity capital. Business angels invest capital in exchange for shares⁷. In contrast, the formal venture investments take typically the following forms: contributions, subordinated loans, convertible bonds and mezzanine instruments which combine the characteristics of both equity and liability capital (FVCA 2002). Also other forms of formal venture capital are possible. An example of a clearly increasing trend in formal venture investments area is the investment process the Foundation for Finnish Inventions follows. The Foundation for Finnish Inventions grants capital to support product development, commercialization and patenting of an invention that has been developed in co-ordination with the foundation. The refund is normally conditional: if the

⁶ A thorough presentation of informal venture capital including both business angels and friends and family members is given by Riding (2008).

⁷ Business angel is not an owner in its traditional definition: although he receives an equity stake of the firm he invests in, literature does not define angel investor as an owner of the company (FVCA). The angel investor will exit the firm as planned and the equity stake could be seen only as a compensation method.

invention is commercially successful capital has to be paid back⁸. According to for example European Commission (2008), this type of formal venture capital is increasing in volume in the Euro zone.

In addition to investing capital, informal and in some cases formal venture investors provide human capital. By participating in the management, control and development of the business, venture investors attempt to increase the value of the company. The value added venture investors bring culminate mainly to board seats, helping in developing management, strategies and finance, business sector knowhow and internationalization of the firm, and M&A activities. In addition, a firm is viewed as more credible by other stakeholders when there is a venture capitalist involved with it. The increased credibility improves the chances to receive additional capital from other sources (FVCA 2002).

In order to end the chapter, a final definition of the differences between formal and informal capital is provided. Harrison and Mason (1992), among many others, identify three aspects that distinguish informal venture capital from formal venture capital. First, business angels concentrate on providing relatively small amounts of capital for firms in the startup and early stages. For the second, angel investors are more accommodating to the needs of business owners since they have lower rejection rates and longer exit horizons. For the third, angel investors usually invest in their local economies.

3.1.2 The different financing options growing microenterprises face

According to FVCA (2002), informal capital is one of the best financing options for a firm that both has high growth potential and also aims for high growth path. Young seed stage and startup companies are often included into the definition. A growing company has to make investments which require capital. Microenterprises do not usually reach high turnover and net income levels and thus the financial inflows are insufficient. As a young firm, the enterprise couldn't have either gathered adequate cash buffers. This leaves the growing microenterprises extremely dependent on outside financing.

With informal capital come many advantages over other forms of financing. The flexibility of angel investments compared to other sources as well the proper amounts and the business angel's commitment to the investee enterprise are typically considered as a benefit of informal capital (Harrison and Mason 1992). Value for business owners is not only created when the amounts of finance

⁸ The refund often includes also a provision of the income the invention generates. The Foundation for Finnish Inventions demands 3% of the income stream. In the case that the invention is sold to a third-party, the foundation requires 30% of the sales price.

demand and supplied meet (which is not the case usually with formal venture capital) but also the angel's participation in the business creates value. Also compared to debt, equity capital investment increases the liquidity of a firm. There are neither interest payments nor installments, in other words regular and compulsory capital outflows.

Research indicates that in order to receive angel financing there are some conditions that the investee firm should fulfill. According to the Finnish Venture Capital Association (2002), a firm must have competitive advantage in products and services it offers compared to other firms in the market. The second requirement is that the management team must be committed to develop the business, which ultimately means that the attitude towards growth has to be positive. For the third, the entrepreneur must be prepared to dilute the ownership for a limited period of time and give a proportion of the company in exchange for capital.

There are also negative consequences related to business angel financing. First is the above mentioned dilution of ownership. Also, despite the angel investor and the business owner share the same goal - to increase the value of the company and make the business successful – and for that reason informal venture financing should be the most profitable and advantageous financing method, informal capital is extremely risky and thus expensive for the entrepreneur.

Formal venture capital is quite a similar financing tool for microenterprises. As presented earlier the forms venture capital often takes include contributions and all sorts of debt instruments (proper listing in section 3.1.1.). Similarly to informal venture capital, formal venture capital does not always require timely cash outflows and in some cases, the venture capitalist provides also his human capital or important contacts with other stakeholders. However, formal venture capital is not often an option for microenterprises and usually the supplied and demanded amounts tend to mismatch.

Bank debt is increasingly not an option for the high risk microenterprises. Public debt markets and banks in general are prevalent sources of debt capital for large companies (banks for small companies that are not that risky) but not for growing microenterprises. There are a couple of fundamental reasons behind this. First of all, new growth companies do not usually have real securities that banks require. Due to the nature of the business innovative young enterprises exhibit, usually the only assets such firms have are human capital and intangible rights. Banks do not accept these assets as collateral. A potential cure for the difficult situation is the involvement of a third party that could provide collateral for the loan on

behalf of the borrowing firm. For the second, banks are not aware of the prospects of new companies and of the entrepreneurs themselves since there is no historical data or track records. Asymmetric information is prevailing between the provider and the borrower of capital which ultimately makes the market inefficient. For the third, there have been changes in the banking sector which have reduced lending for startup and seed stage enterprises. In addition to the three obvious reasons, banks face the same deterrent as the formal venture capitalists: the high risk level that is due to the fact that the firm is trying to grow.

Nevertheless, microenterprises do receive bank debt in some cases. With debt financing, the entrepreneur could avoid the ownership dilution. Also, for such entrepreneurs that regard business angel involvement with the enterprise reluctantly, bank debt could be a relief since then an angel investor is not part of the business. The negative sides of debt include interests and installments. The outward cash flow can weaken the financial situation of the young enterprise and cause financial distress since the interests and installments have to be paid in time. A growth firm may find it difficult to meet the payments since, as discussed above, the turnover and operating profit fluctuate and the cash buffers are not yet sufficient. Also, often during heavy growth periods, the income that is left for debt liabilities and tax payments decreases. The required installments and interests could at worst case drive an enterprise into insolvency.

Other potential sources of capital include loans from family members and friends. This type of capital is insufficient, inefficient and not a financial option that should be reckoned with in the thesis. A proper presentation of capital provided by family members and friends can be found in Riding (2008).

In conclusion, a note should be made. According to studies, companies prefer some forms of capital over others in financing investments. The theory based on this observation is called *the pecking order theory*. The pecking order theory suggests that in making investments, firms prefer to use first and most income but if it is not achievable, debt financing in the order of harmlessness (Brealey et al. 2008). However, due to the obstacles young firms face in the borrowing markets, they are forced to come up with different financing solutions compared to the more traditional ones. As a conclusion, the pecking order theory does not hold for such companies. Indeed, it is noticed that the pecking order theory is reversed for new firms: new enterprises receive hardly any income and banks are reluctant to lend. New firms prefer equity over debt in financing investments and the last form of capital in question is income.

3.2 The venture capital market

Traditionally banks have been the most important lending institution for all kinds of companies. The importance of banks as lenders has been noticed all around the world and already many decades ago. When in need of capital, firms of all sizes and ages have turned to banking institutions for loans and other capital instruments. Even nowadays a major number of all researchers, academicians, politicians and other powers in societies share the opinion that banks are an unbeatable institution in the lending market. Due to the importance of banks, financial needs have been previously fulfilled with the traditional forms of debt capital: loans and short-term credits.

However, today an increasing amount of capital comes from other sources than banks. The financial markets have developed in a quick pace which means that there is also public capital available (different kinds of bonds and equity among others). Especially the stock markets around the world have developed enormously which makes equity capital available for many companies. An obvious trend is that the importance of banks as capital providers is decreasing.

In spite of the pecking order theory, even large companies need to finance some of their investments with equity capital in order to keep the financial distress and too high capital costs in discipline. For large companies, despite of them been public or private, it is somewhat easy to raise both equity and debt capital either from the financial markets or from the current owners. The situation is clearly worse for microenterprises. They are increasingly seeking financing from other sources than banks and today, the venture capital market is raising its importance among the possible lenders.

3.2.1 The venture capital market participants

According to Finnish Venture Capital Association, there are both domestic and foreign venture capital companies as well business angels in the venture capital market in Finland. The venture capital companies are different from each other by many aspects. Some of them operate only locally and on the other hand, large companies may have their own venture capital units that make investments to firms in the same field. Through these so called corporate venturing investments, large companies aim to retrieve strategic benefits for the parent company (FVCA).

In year 2008, the demand side of the Finnish financial market was as follows. 99% of all firms were small enterprises employing fewer than 50 persons. The share of medium-size enterprises employing fewer

than 250 persons was 0.8% of the total amount of firms, and 0.2% of all firms were large enterprises employing more than 250 persons. The share of the smallest enterprises (microenterprises) employing less than 10 persons was 95% (Statistics Finland).

The small enterprises employed 46.4%, medium-size enterprises 16.4% and large enterprises 37.2% of all personnel. In contrast the largest share, 51.3%, of the total turnover was generated by the large enterprises. The share of small enterprises was 32.6% and that of medium-size 16.1% (Statistics Finland).

According to Statistics Finland, the number of the very smallest enterprises employing fewer than five persons increased by most, by 4.5%, from the previous year. By contrast, personnel and turnover increased most in large enterprises.

By looking at the structure of Finnish enterprise sector, it can be noted that small companies clearly dominate. To my opinion, there is obviously potential in micro companies for two reasons: there is an enormous amount of microenterprises and the relative growth potential is indescribable. A microenterprise with a couple of workers and a great business idea can grow with the right kind of people, strategy and actions involved with it. If one enterprise grows from a two-to-five employee company to employing from 20 to 30 people, it is surely regarded as a positive matter but nevertheless, the impact for the whole economy is extremely small. But, when more than one microenterprise experience high growth, the effect on aggregate employment and economy is also relatively speaking much larger. The number of extremely small companies that could grow to employ even tens of employees is very high and thus also the total effect on employment could be remarkable⁹. Thus the small enterprise sector has a lot of potential to enhance national welfare and growth and the small enterprises cannot be overlooked in any way.

Such a high growth in the number of employees requires evidently that the entrepreneurs want their firms to grow. Not all small companies aim to grow but there are surely many such enterprises that would like to expand the business, if the growth was only possible. Rainio (2009) studied the attitudes towards growth in the Finnish enterprises. Her study clearly indicates that the Finnish entrepreneurs are too risk averse and thus, too few entrepreneurs are willing to take on the necessary risks that it takes to grow. According to Finnish Venture Capital Association (2002), Paasivirta and Aaltonen (2003) and Rainio

⁹ In year 2008 the amount of small enterprises was around 317 700 and of microenterprises 305 000 (statistics Finland).

(2009), informal investors notice their investment targets on the basis of their growth potential and willingness to grow. Thus the risk aversion of the Finnish microenterprises further increases the financial problems they face.

The methods to finance growth vary substantially. According to FVCA, among all sizes of companies that are planning to grow fast in the near future 40 % will seek external finance. The figure for small and medium sized companies is usually almost twice as large, being almost 80%. From small and medium sized high growth companies that are going to seek external finance 65% will approach banks, 46% Finnvera, 30% venture capitalists, 6% insurance companies and 23% other sources.

In Finland, there are quite many large formal venture capital firms. Some of them are completely and some only partly owned and financed by the Finnish government. These include for example Finnvera, Tekes, Finnish Industry Investment Ltd, Veraventure, Finnish Foundation for Innovations and Sitra. I introduce them briefly, except for the Finnish Foundation for Innovations since it is discussed already earlier in the thesis.

Finnvera is a government owned financial institution. Its primary goal is to help young growth firms to receive financing, grow and internationalize. Tekes on the other hand supports research, development and innovation activities in Finland. Its aim is to provide finance and knowhow to technology based firms and also, to help them to network with important contacts. Besides financing private companies, Tekes gives financial support to public companies and research projects as well as to municipals and universities among other public institutions. Sitra is a self-sufficient fund subject to public law. It functions under the Finnish parliament. Sitra's objective is to enhance the competitiveness of Finnish companies and to improve the welfare in Finland. Finnish Industry Investment Ltd is a government-owned investment company. Its primary investment methods are equity investments and it makes investments in venture capital funds, private equity funds and directly to selected target companies. The organization is administered by the Ministry of Trade and Industry (Lauriala 2004).

An obvious common feature of the above discussed venture institutions is that they finance innovative growth companies that are already established. This group does not include startup and seed stage companies. Thus as a conclusion, the formal venture institutions might be proper sources of investment and growth capital for small established enterprises but not for startup and seed stage enterprises.

In the venture capital market in Finland there were also 46 private equity houses and venture capitalists in 2004 (Lauriala 2004). In addition, there is a large number of venture capital communities in Finland. The Finnish Venture Capital Association (FVCA) is an umbrella organization for many of them. FVCA attends to the communities interests, supports research in the field and connects venture capitalists with firms that need venture financing.

Below figure depicts the Finnish private equity market.

	Finnish parliament				Sitra	Nonprofits etc.	Private firms
	Government			Ministry of finance			
	Ministry of Trade and Industry	Tekes	Finvera				
Tax & legal environment	Tax & legal environment						
Deal flow generation and match making		TULI, LIKSA, VARA, KEPARA, AKUPPI			INTRO, DIILI	Venture Cup, Connect, etc	Consultans, incubator programs etc.
Grants		R&D grants					
Indirect equity (FoF)			Veraventure	FII fund-of-funds activity	Sitra VC fund investments		
Direct equity (VC)			Avera	FII seed program	Sitra PreSeed & Sitra VC investments		VC firms and business angels
Capital loans		Startup loan	Avera & Finnvera	FII seed program			VC firms and business
Loans and loan quarantees			Finnvera loans and loan quarantees				Banks

Figure 1. The private equity sector in Finland from the supply perspective (source Maula et al. 2007)

Tuli, Liksa, Vara, Kepara and Akuppi are different financing projects by Tekes¹⁰. All the projects include different financing instruments. The FoF is an abbreviation for funds of funds, VC for venture capital and FII for Finnish Industry Investment Ltd.

Maula et al. (2007) demonstrate the turbulence in the Finnish venture capital market. According to the researchers, the amount of private investors fell from over 60% in 2000 to as low as 30% in 2005 in the early stage investor group. They also note that the amount of business angels in the register of Sitra's INTRO market place accounted for 450 (in 2006) while the number ten years ago in Sitra's Matching-service (in year 1996) was just 100. Fortunately, the amount of business angels has increased substantially over the ten year period. I believe the trend is ongoing. On the 2nd of November 2010, it was presented in the media that some of such Finnish business owners that either had sold their own enterprises or in some other way had accumulated much wealth in year 2009, had already now become business angels (Yleisradio). The report also suggested that much of the business angel investments were made in the local businesses.

3.2.2 The evolution of the venture capital markets in Europe and Finland

This subsection describes both the evolution and the current situation of the venture capital markets in Europe and Finland. I take the view of both the financiers and the enterprises in my presentation. I will also briefly demonstrate the overall private equity market in the Europe. I start the section with a discussion about the financial environment for small enterprises and especially how it has changed during recent years and what consequences the changes have had.

The financial circumstances in all over the world have changed in recent years. The major causes have been the financial crisis, tightened conditions in the legislation and regulation (Basel 2 and 3 regulations for example), and other changes in the financial sector¹¹. Due to the changes in the financial markets, banks are directing loans and credits to larger and less risky companies. Vasilescu (2009) argues that authorities and policymakers are so slow in their decisions to answer to the changing financial environment, that small and medium-size enterprises in Europe have increasingly started to look for

¹⁰ Some examples of the projects. Under the project Tuli, a maximum of €10 000 is granted to an enterprise for the purchase of expert services that aid in product commercialization. An enterprise participating in the LIKSA program receives a grant a maximum of €20 000 from Tekes, and in addition, a €20 000 convertible loan from Sitra to buy support for business plan development which should improve investment readiness.

¹¹ For more information about the Basel 2 regulation see Casu, Girardone and Molyneux (2006): *Introduction to Banking*.

alternatives to loan financing. The alternatives include equity, debt-equity combinations, leasing, and guaranteed loans and equity (Vasilescu 2009).

Also formal venture capitalists are set against young innovative companies since they are high risk investments. For example, venture funds have legal duty concerning the manner they invest and thus they tend to invest in less risky companies than the micro firms. Often formal venture institutions finance such enterprises that already have established their businesses and usually there is also a lower bound in the company size that the institutions require (as proposed above in the presentation of formal venture capitalists). In addition, the changes in the world economy have directed formal venture capitalists to invest in less risky targets and thus nowadays they finance already established companies and make follow-on investments.

Entrepreneurs have noticed that the access to finance has increasingly become long-term constraint to growth (Confederation of Finnish Industries 2008; Mason 2005 and 2008; Rainio 2009 and Riding 2008). The main causes considered by entrepreneurs themselves are the already above mentioned new economic circumstances that the international financial crisis caused and the changing banking sector but also the increased sophistication of entrepreneurs themselves.

As bank debt is decreasing in importance, informal venture capital has become important for microenterprises. It is necessary for such reason that the financing problem is especially acute when an enterprise has not yet reached the size that most venture capital institutions require. Literature suggests that business angels may act as an important link between the initial investments of the entrepreneur, family and friends, and the later involvement of other investors, including venture capital institutions and the public sector (Mason 2008 and Vasilescu 2009 among others). Also it turns out that besides literature, the real investment cases prove that business angels finance young microenterprises and venture capital firms invest at later stages in firms' life-cycles (figure 2). The point is also noted by Aernoudt (2005), Mason (2005), and Markova and Petkovska-Mircevska (2009). They found similar results to Vasilescu (2009) and others, that business angels have become more important in the financing of microenterprises since formal venture capitalists and banks move towards larger deals and shift their investments to later stages of firm development.

Figure 2 depicts the suggested capital options for companies at different stages of firm development.

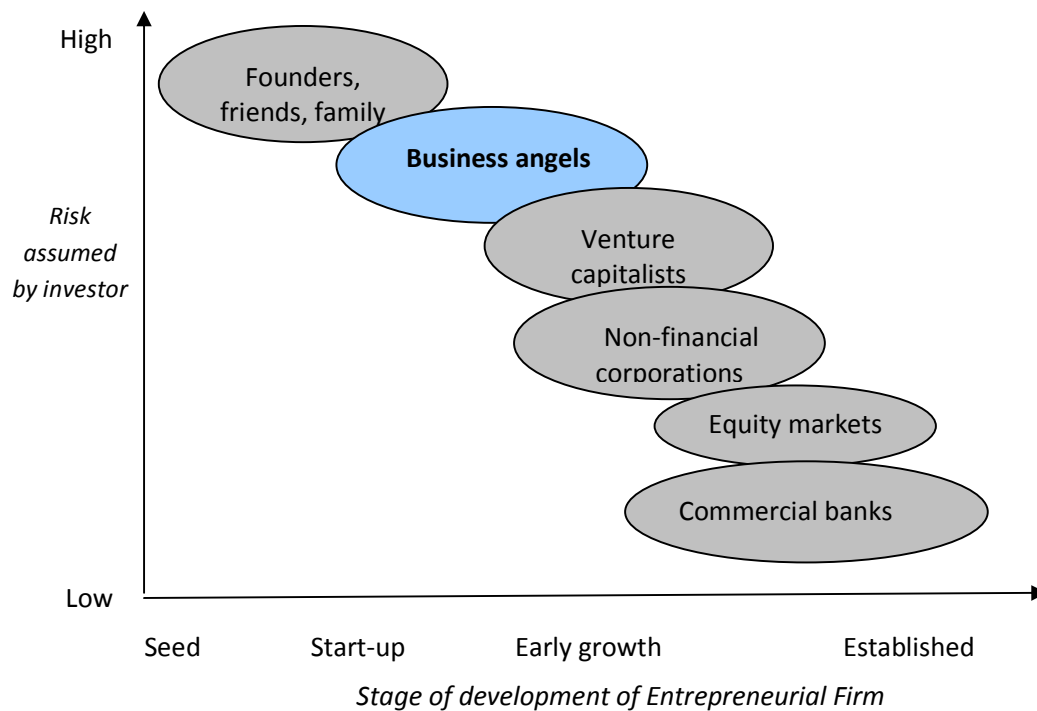


Figure 2. The role of business angels on the firm's development (source Vasilescu 2009)

Before depicting the European and the Finnish venture capital markets, I present figures and pictures from the United States (the US). The objective is to provide some base for comparison between the most successful and the most developed venture capital market, the United States venture capital market, and the European and the Finnish counterparts.

The below graph presents the total dollar amount of venture capital investments made between years 2000 and the first three quarters of 2010 in the United States. From the peak year in 2000 the invested amounts have decreased enormously.

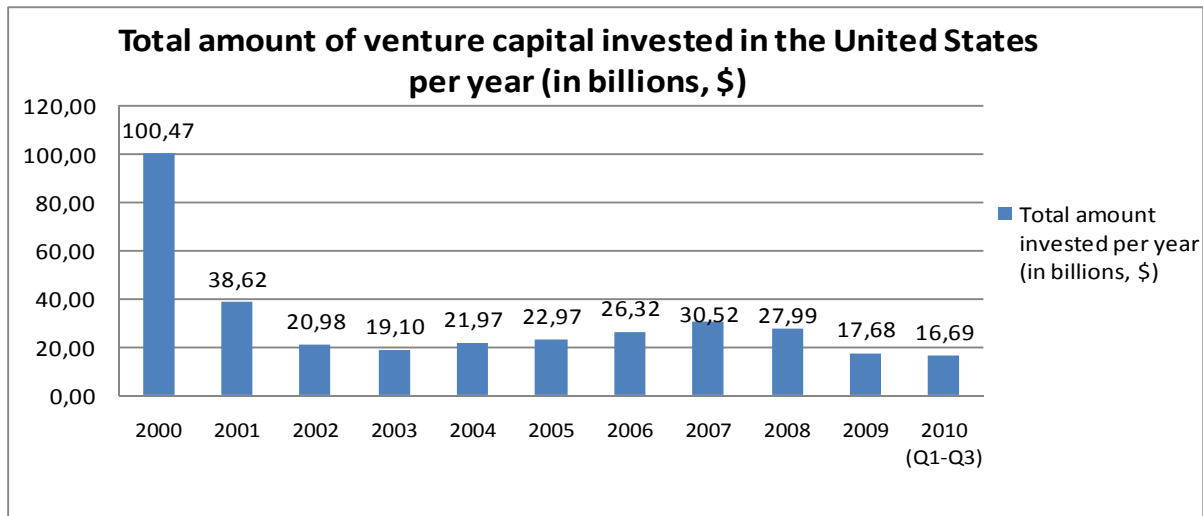


Figure 3. Total amount of capital invested in the United States venture capital market between years 2000-2010 (source National Venture Capital Organization)

According to Sohl and Sommer (2007), business angels have historically financed ten times more startup companies than venture capital funds in the United States. The researchers estimated that there were 400 000 business angels investing \$30 to \$40 billion per year in 50 000 enterprises in 2007. In addition to financing seed and startup companies, business angels were increasingly investing in post-seed and post startup companies. 35% of investments were directed to enterprises in those stages. On the other hand, expansion stage investing increased the most resulting in 21% of all investments. Nevertheless, new investments represented 63% of business angel investment activity. In relation to the preceding argumentation, the below figure presents the investments by stages of firm development for the whole venture capital sector in the United States. The trend seems to be similar to the European and the Finnish venture capital investments (discussed below): most investments are directed to more established enterprises than the startup and seed stage companies.

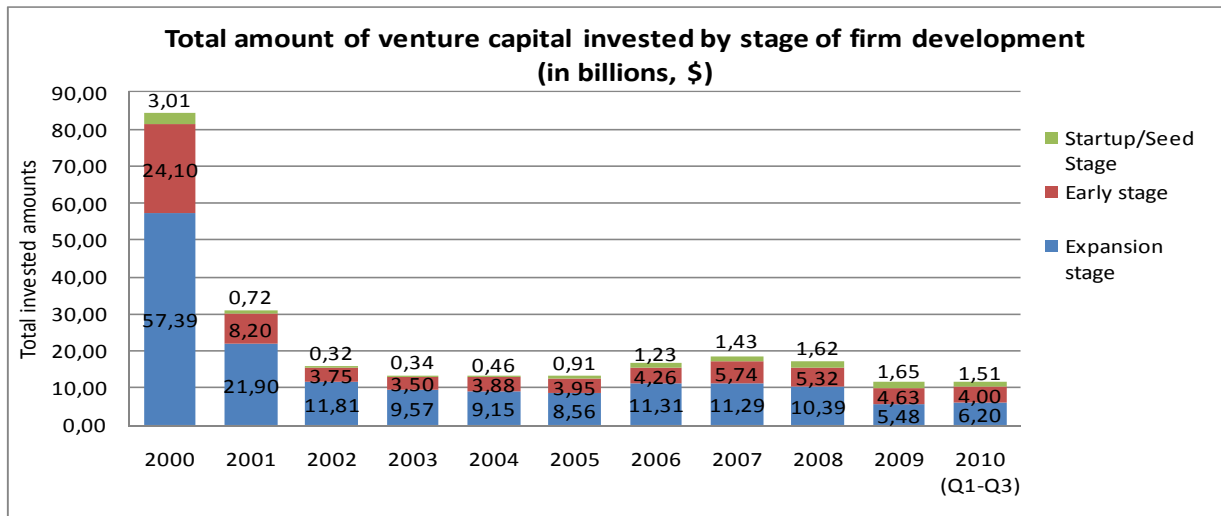


Figure 4. Total amount of venture capital invested by stage of firm development between years 2000 and 2010 in the United States (source National Venture Capital Organization)

In the below figure the trend of private equity investments in Europe is depicted. The figure indicates that the trend in the European private equity market before the financial crises and the economic downturn was increasing but after the major events, the invested amounts dropped substantially. The figure doesn't indicate in which direction the year 2010 is heading; whether the private equity market is healing or the decreasing trend is ongoing. The graph should not however be compared with the figure depicting the venture capital market in the United States since the European numbers include all private equity (venture capital belongs to the group *private equity* among other financial instruments). Due to the lack of research and statistics about the European venture capital investments, figure 6 depicts the percentages that indicate how much money is spend on venture capital in some countries compared to the gross domestic product (GDP). From the figure, it is not difficult to draw conclusions that the European venture capital market is less deep and less developed than the venture capital market in the United States.

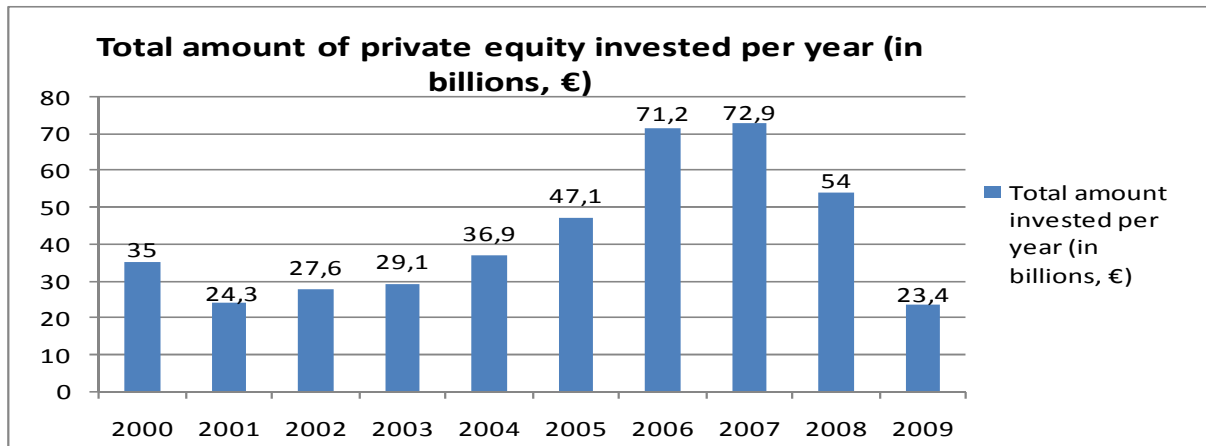


Figure 5. The invested amounts in the European venture capital market during years between 2000 and 2009 (source European Venture Capital Organization)

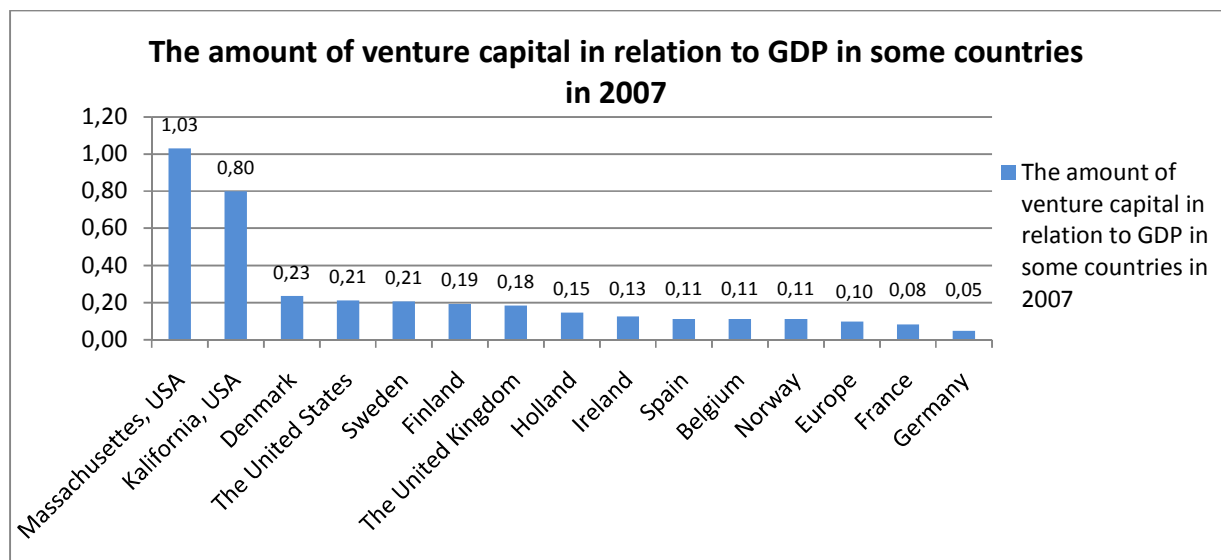


Figure 6 The amount of venture capital in relation to GDP in some countries in 2007 (source Rainio 2009)

Comparing to the United States capital market, in Europe the entrepreneurs are much more dependent on bank loans and overdrafts for early-stage financing. The lack of risk capital creates the worst problems for young enterprises since, as proposed previously, loan financing is more expensive, less flexible and less secure alternative than risk capital and also frequently available only under favorable economic conditions (Vasilescu 2009).

According to Rainio (2009), the value of informal investments in Europe is 10% of the value that is invested in the US. She argues that the longer history of venture capital markets in the US explains the difference in investment activity. On the other hand, Vasilescu (2009) proposes that market fragmentation, institutions and regulations, and taxation as well as paucity of high-tech small and medium-size enterprises, human resources and entrepreneurial culture are reasons for the sluggish development of the European venture capital market.

Investors regard also risk differently in the two continents. Investments to young new firms yield lower returns in Europe compared to the US, which ultimately means that the European investors are more reluctant to invest in young companies than the US counterparts (it can be assumed that the risk levels in both continents are quite the same but as mentioned, the rates of return differ). Also, high due diligence costs for small deals in Europe often prevent entrepreneurs from receiving early stage financing. As a result, venture capital has been used to finance management buyouts and the later stages of firm development rather than seed and startup stages. According to European Commission report (2003), only 17% of formal European venture capital went to seed and startup investments (Rainio 2009).

According to Mason (2008), among many others, the European business angel market is currently evolving from an invisible, atomistic market dominated by individual and small ad hoc groups of angel investors. The direction seems to be towards a more organized and professional market place in which angel syndicates are becoming increasingly significant (the angel syndicates will be discussed in more detail below) (May and Simmons; 2001; May and O'Halloran, 2003). The organization of the business angel market could increase the market efficiency and thus direct more funds to microenterprises. At least, the increasing organization might make the business angel activities more visible, which could then help the academics to propose suitable policy actions that could indirectly affect the market efficiency.

There has been a remarkable structural change in the Finnish enterprise financing sector. The importance of financial institutions has diminished substantially while the significance of stock markets has increased. Due to globalization and development of the Finnish capital markets, the financing opportunities firms nowadays face have diversified substantially. However, loans are still an important form of financing (Rainio 2009).

In Finland, venture capital markets began to develop and grow in the early 1990's. Risks as well as financial instruments have diversified, grown and developed during that time. Nevertheless, the venture capital market is still rather small and the operating culture is young. The venture capital market is too small to operate efficiently, be competitive and liquid. According to Rainio (2009), despite these circumstances, the Finnish venture capital market is credible and transparent and it has grown steadily from the beginning.

According to the Finnish Venture Capital Association (FVCA), startup companies received the most venture financing, both in terms of value and number of investments in 2009. The number of start-up companies that received financing was 98 (104 in 2008) the total value being €42 million (€48 million in 2008). The amount of seed stage companies that received venture financing was 60 (66 in 2008) and the total value reached €11 million (€11 million also in 2008). The later stage companies received venture capital by €29 million (€58 million in 2008) and the number of the companies was 29 situating both in Finland and abroad (FVCA).

Since the interest in the thesis is on the technology oriented growth companies, I briefly present also the capital raising activities by high-tech growth firms. The capital source is either Finnish or foreign venture capital fund or business angel. The presented study is the most recent Technopolis Online Research and the investment period in question is the first half of 2010. The results indicate that 28 Finnish high-tech growth companies raised €49,5 million (€54,3 million in the first half of 2009) risk capital during the first six months of 2010. The number of business angel investments decreased by 60%, while the decrease in the overall amount of invested capital was only 28%. The value of the domestic formal investments increased by 15% from that of last year, while the value of foreign formal investments decreased by 35%.

In the first half of 2010, the domestic venture capitalists increased the average investment sums while the total amount of capital invested stayed the same. Only 10 angel investors invested either alone or in a group. The number of angels investing in the first half of 2009 was 25. Also, the value of the business angel investments decreased from €4,8 million to €3,5 million. According to the survey, the number of seed stage investments decreased from 37% to 25% of all investments (Technopolis 2010).

Business angel investments could be viewed as accelerating the overall level of business angel investments. The more there are business angels that invest in successful microenterprises the more

there can be new business angels in the future churning the favor to new microenterprises. As the below presentation will verify, there are many motives behind business angel investments, one of them being the aspiration to aid the younger generations of entrepreneurs to succeed.

Although there has been development in the informal venture capital sector, the volume of informal venture capital in Finland is anything but good compared to other countries. According to the Global Entrepreneurship Monitor (GEM), the volume of informal venture capital as a percentage of GDP in Finland was among the lowest of the participating countries in 2005 (Maula et al. 2007).

A note should be presented about the accuracy of the measures of business angel investments. According to research, the calculations of the amounts invested by business angels are an underestimate of the actual size of the informal venture capital market. First, most business angels have further investable funds available but they cannot identify appropriate investment opportunities (Coveney and Moore, 1998; Mason and Harrison, 1994, 2002). It is argued that this uncommitted capital is substantial. Second, there is a substantial pool of potential, or virgin, business angels who share the characteristics of active angels but have not yet entered the market. Often virgin angels are constantly looking for suitable investment targets that could serve as first investments.

The below figure demonstrates the amount of venture capital that is invested in the start-up and seed stage companies in Finland during 1997 and 2007.

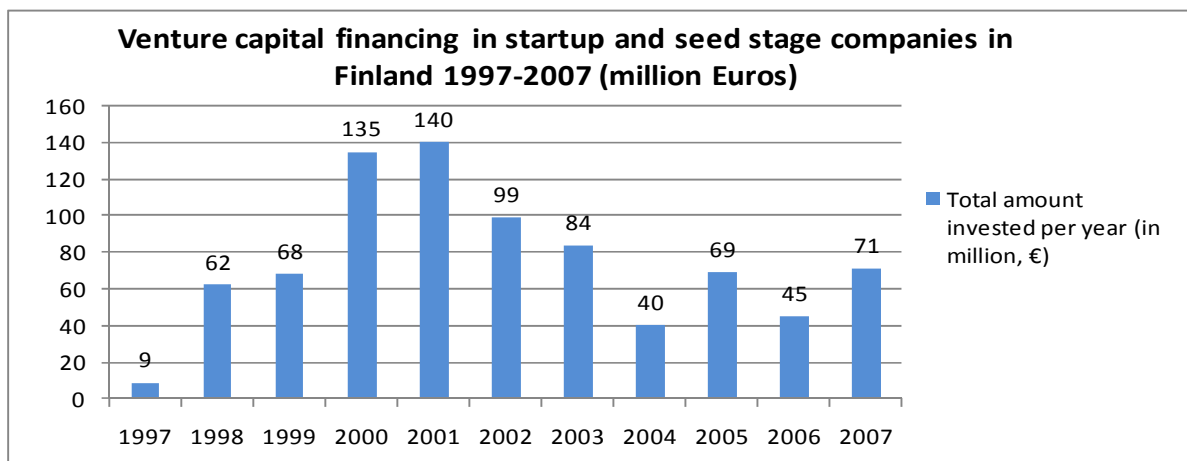


Figure 7. Venture capital financing in start-up and seed stage companies in Finland 1997-2007 (source Rainio 2009)

After the peak years in the beginning of the decade, the amount of venture capital invested in startup and seed stage companies have halved. Fortunately the trend seems to be slightly upwards, although the amounts fluctuate strongly. An interesting finding is that the Finnish venture capital market had its peak in 2001 whereas as the figure 5 proposes the European private equity markets peaked much later, in 2007.

The next graph clearly shows the trend in the venture capital market that is proposed already before in the thesis: venture capital investments are directed to already existing companies that have established their businesses.

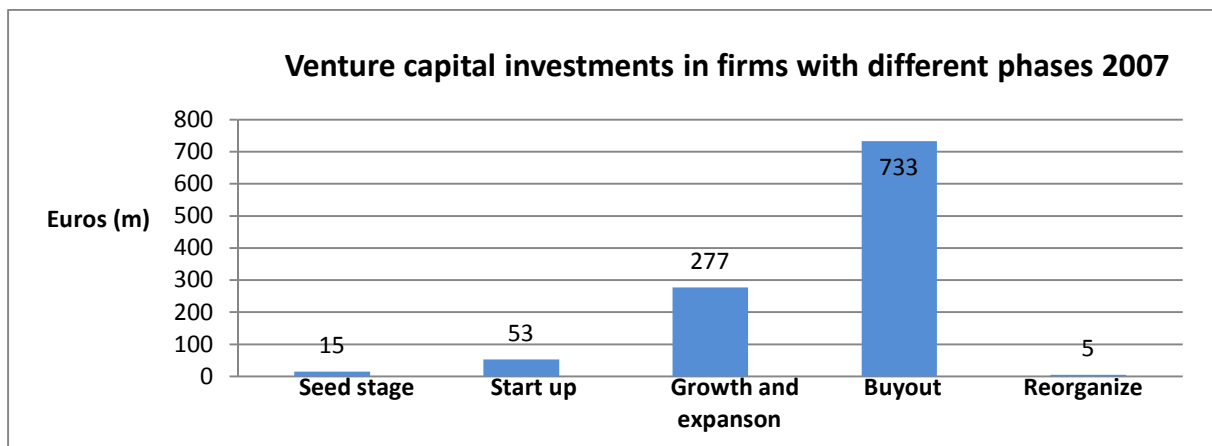


Figure 8. Venture capital investments in enterprises with different phases of development in 2007 in Finland (source Rainio 2009)

As argued, there is much potential in the informal capital market if the true investing volumes could be unleashed. In Finland, there is currently much discussion about the means by which business angel capital could be utilized more thoroughly. Legislation and taxation may, and to my opinion should, change in the future to better support the financing activities of business angels and small firms. Rainio (2009) and Paasivirta and Aaltonen (2003) present some suggestions in their researches about the means that could make the informal capital market more efficient.

Below I present clear empirical evidence that supports the arguments that first of all, formal venture capitalists do not usually invest in microenterprises and for the second, the informal capital market is too small. Also, the concept of equity gap is presented.

According to the European Business Angel Network (EBAN), formal venture capitalists invest a minimum of €2.5 million in companies. It is argued in the EBAN website, that a minimum investment as large as €2.5 million leaves a market gap, or failure, in smaller amounts of equity. According to EBAN, business angels invest between €20.000 and €250.000. Although there is an enormous gap between the amounts individual business angels invest and the minimum amount venture capital funds invest, the gap can be decreased if business angels co-invest with other investors (that is business angels form a syndicate) or they invest through a co-investment fund (EBAN).

Mason (2008) addresses the same matter. In addition to EBAN, Mason (2008) argues that venture capital funds are constantly increasing the minimum size of the investments and they are increasingly abandoning the early stage market, that is startup and seed stage enterprises. As it is proposed in the EBAN website, also Mason (2008) proposes that the equity gap could be reduced in the future since business angel syndicates are increasingly emerging.

According to Mason (2008), angel syndicates solve the inefficiency problem in the business angel market as well narrow down the equity gap¹². The equity gap is in the £0,5 million to £2 million range (Mason 2008) or from €0,25 million to €2,5 million (EBAN). Usually the capital amounts entrepreneurs request that fell in the equity gap area, are too large for the founder himself, his family or friends to invest and too small for the venture capitalists. Thus the only source of venture capital in the range is provided by business angels alone or in syndicates (Mason 2008).

Fortunately, the situation in the venture capital market in Finland seems to be somewhat better compared to the European situation. In Finland, for example Tekes and Sitra provide capital in smaller amounts and thus they increase the supply of capital directed to smaller firms. As a result, the equity gap could be narrower in Finland.

In the below figure, I depict the amounts of venture capital demanded in Finland during years 2004 and 2005. It can be noticed from the figure, that companies demanding less than €600 000 meet the most competition in the financial market. According to the figure, there is the same equity gap in the Finnish venture capital market as is in the European market. In fact, the typical business angel investment is in

¹² The angel market has traditionally been characterized as inefficient since the fragmented and invisible nature of angels. Business angel syndicates are more visible and thus easier for the entrepreneurs to approach (Mason 2008).

the range of €10 000 - €150 000 (Suomen Bisnesenkeli Ry). Nevertheless, as proposed above, some venture capital institutions provide also small amounts of capital and the lower range of demanded capital is fulfilled somewhat better compared to Europe when the venture institutions are also providing capital in that range. However, this argument does not take into account the fact that venture institutions do not provide capital to microenterprises. Thus, although venture institutions provide also smaller amounts of capital, the financial situation of microenterprises is not any better. However, as microenterprises hardly demand large amounts of capital, it could be argued that such companies do not suffer from the capital shortage that the equity gap generates.

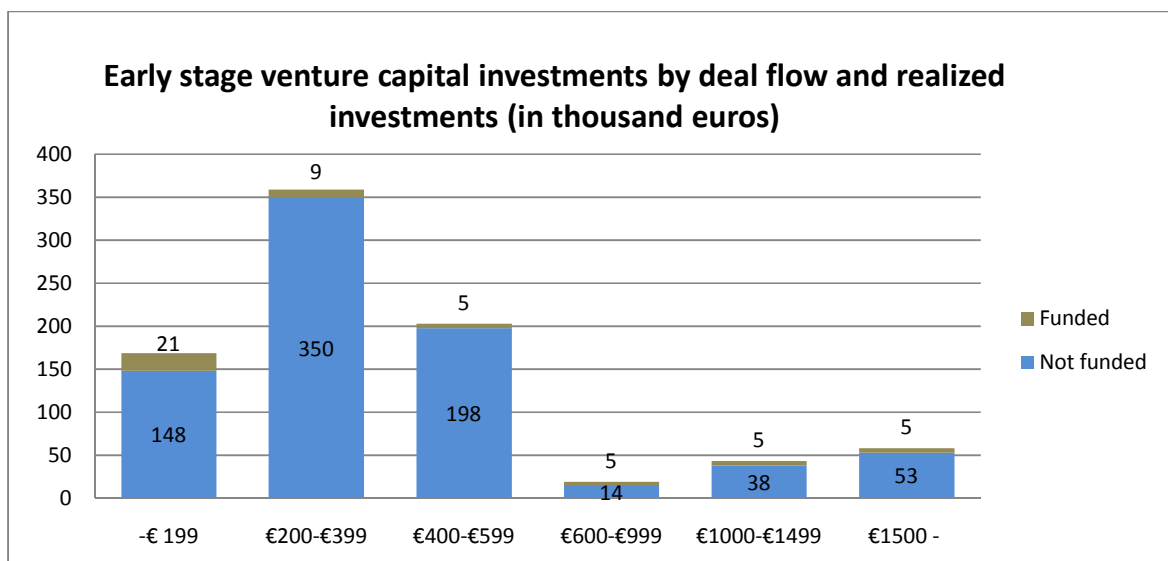


Figure 9 Market-level early stage venture capital deal flow and realized investments by size (source Rainio 2009)

According to Rainio (2009), informal investors in Finland are quite risk averse. She claims that the risk aversion creates shortage of funds in the market and the shortage of venture capital financing accumulates especially on startup and seed stage companies (which also supports the findings in figure 9). Also, when young growth firms receive informal capital the amounts are too small, as is the case also in Europe (Rainio 2009). Business angel syndicates would clearly enhance the efficiency of the venture capital market in Finland. Besides providing larger amounts of capital, business angel syndicates could share the risks together and thus the syndicates would help to solve the problems risk aversion creates.

3.2.3. The economic significance of informal venture capital market from an economic development perspective

The informal venture capital market is important for the economic development at national, local and regional scales. The following presentation summarizes the most important features of informal venture capital proposed already earlier in the thesis.

According to Mason (2005), there are three aspects of the informal venture capital market that are significant from an economic development perspective.

For the first, the amount business angels are able to invest and have invested is significant. The economic significance of the invested amounts stems from the targets that receive the capital. Mason (2005), as well many other scholars noted that business angels provide capital to entrepreneurs that would not otherwise receive any outside financing since the amount they are willing to accept is far too small for the formal venture capitalists to be interested in. Thus as presented earlier, angel financing fills at least the lower parts of the equity gap and the reason for the significance results from *the size of the investment*. In terms of *stage of business development*, investments by business angels are skewed toward the seed, startup and early growth stages whereas venture capital funds focus on later stage deals (Mason 2005, among many others).

For the second, the economic significance of the informal venture capital market stems from the hands-on involvement of business angels in their investee businesses. Demand-side studies indicate that many entrepreneurs are seeking smart money and for this reason, business angels are valued ahead of other funding sources (Mason 2007; Cressy and Olofsson, 1997; Sætre, 2003). The entrepreneurs business angels finance derive considerable value from the expertise, knowledge and experience angels pass on through their hands-on involvement. This increases the prospects that the entrepreneurs' businesses will succeed. Indeed, Mason (2005) notes that entrepreneurs often report that the hands-on involvement of business angels is more valuable than the capital they provide.

Yet other researchers have noted the importance of the hands-on contributions business angels provide. Vasilescu (2009) argues that the most valuable contribution business angels have is experience, both in company's operating field and in general management. Lindström and Olofsson (2001) point out that entrepreneurs are constantly emphasizing that the experience business angels have acquired is even

more important than the actual financing. Particularly for technology-oriented startups this is crucial, and these firms have also ranked business and strategic advice as the primary contribution they required from their investors, followed by money and contacts.

For the third, the contribution of informal venture capital to economic development arises from its geographical characteristics. According to Mason (2005), this has two dimensions. The first dimension refers to the fact that angels are everywhere. Gaston (1990)'s study found that there are four business angels for every 1000 individuals in the US (Mason 2005). Second, various studies indicate that the majority of investments made by business angels are local. As a conclusion, there is a local feature in the angel investments: angel investors identify most of their investments through personal networks, they have a hands-on investment style and a consequent need for frequent contact with the investee businesses. Yet another two conclusions can be drawn. First, in most areas outside of major financial centers and technology clusters, business angels are the only source of risk capital. Second, the informal venture capital market is an important mechanism to retain and recycle wealth within the region it was created.

3.3 Business angels

In this section business angel characteristics are introduced. The following chapter (chapter 4) proposes the value adding mechanisms: business angels are seen to perform four roles in the investee enterprises. The performance of the roles is possible since business angels have below discussed competencies; the roles cannot be performed, or at least cannot be performed successfully, if business angel does not have the necessary human and social capital. The fourth chapter argues that the business angel characteristics can be channeled into higher firm performance by the performed roles. However, before going any further, the following picture clarifies the preceding arguments and also ultimately in the thesis. The purpose of the different colors in the arrow and in the box outlines proposes the effects business angels have on enterprises and on economic growth. Due to the personal characteristics and the involvement with the investee enterprise, business angels increase the firm growth rate (depicted by the darker red area surrounding "enterprise" in the picture). As a consequence, also the impact the enterprise has on economic growth increases (depicted by the darker red arrow and the darker red surroundings of "economic growth").

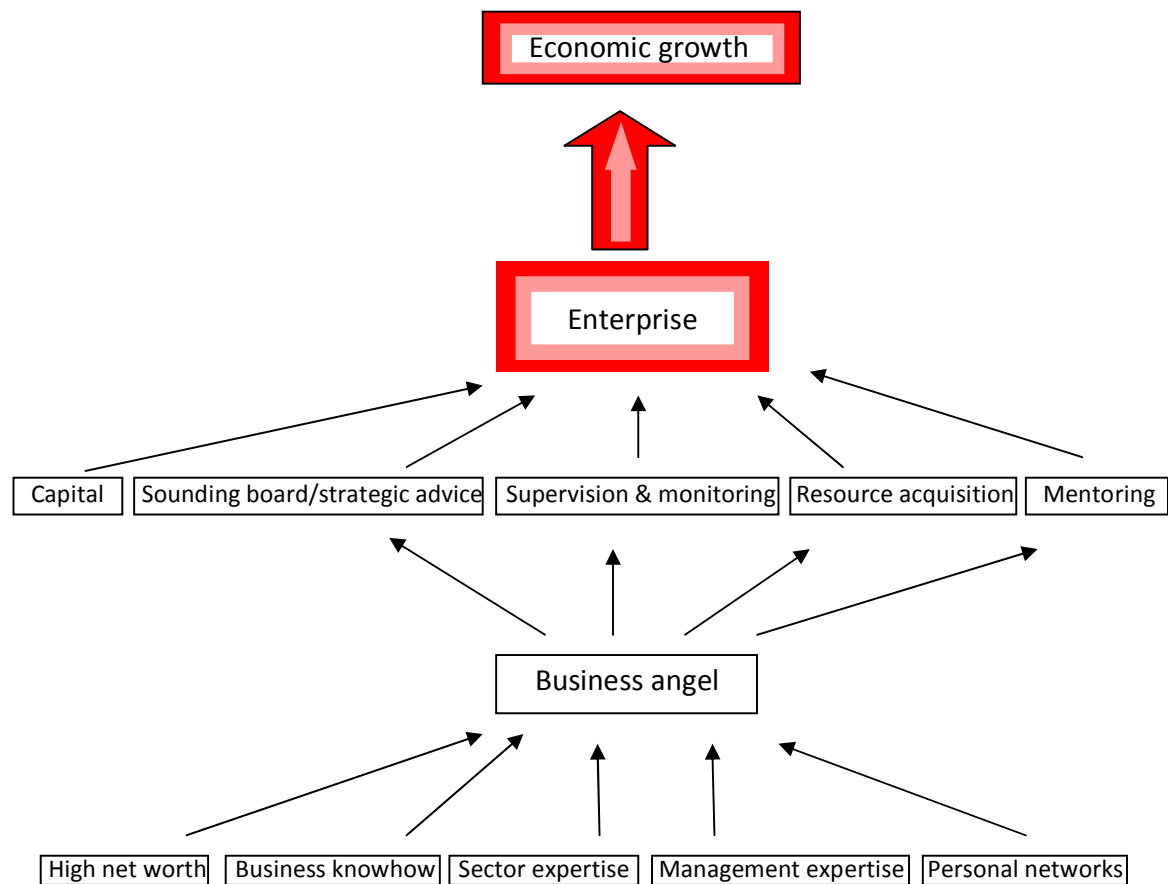


Figure 10 The effect business angels have on enterprises and economic growth

According to countless studies, there is a stereotype of an angel and thus some typical characteristics are often related to business angels. The characteristics are presented shortly. To begin with, a short history for the expression “business angel” is provided.

The term “business angel” originates from England. It was first used to describe wealthy individuals who provided money for theatrical productions. The term was used for the first time in the context it is nowadays known in 1978. William Wetzel, professor at the University of New Hampshire and the founder of its Center for Venture Research, completed a pioneering study on how entrepreneurs raised seed capital in the USA and began to use the term “angel” to describe the investors that supported them (Vasilescu 2008). Wetzel can be held as the pioneer in the business angel research and writers refer to him in many occasions, especially when describing seminal findings.

3.3.1. The stereotype of an angel investor

The literature proposes that there is a stereotype of an angel investor. The below presentation follows Mason (2005) but the same classification can be found from numerous studies, whether in completely similar manner or with some features left out (Markova and Petkovska-Mircevska 2009; Vasilescu 2009; Shane and Heights 2008; and Wetzel and Seymour 1981, among others).

Substantial net worth. A fundamental feature of business angels is that they are often regarded as high net worth individuals (HNIW). According to EBAN (Suomen Bisnesenkelit ry), business angels invest normally between €25 000 and €200 000 (€10 000 - €150 000) in one enterprise. Typically angel investors have a portfolio of two to five investments, but it is not exceptional to find angels that invest in even more targets. As noted also by Vasilescu (2009), business angels will not put their personal well-being and life-style at risk but rather invest only some proportion of their total wealth. Due to the high risk business angels take on when investing in unquoted companies, most of them allocate just 5%–15% of their overall investment portfolio to such investments. The preceding arguments imply that business angels on average are high net worth individuals.

Investing own money. Business angels provide capital of their own compared to formal venture capitalists: their investable capital is collected from such sources as pension funds, banks and foundations, among others.

Direct. Business angels make direct investments to enterprises. It implies that business angels have both personal networks that will provide a flow of investment opportunities and the competence to assess new young entrepreneurial companies.

Time and expertise. Business angels provide more than just capital. They give their own expertise, knowledge and networks for the use of the entrepreneurs.

Unquoted companies. Angel investors invest in unquoted companies: although there is evidence that angels have invested in companies in all sorts of situations, including management buyouts, buy-ins, rescue and turnaround situations, their typical investment is in new or recently started business.

Financial gain. Business angels make investments in order to achieve a financial return. Typically the financial return is realized in an acquisition of the investee company or in an initial public offering (IPO).

In addition, Rainio (2009) found that in Finland the financial gains are increasingly realized by selling the investee firms to foreign investors or companies.

3.3.2. Main types and features

The below grouping proposes that however there are some typical characteristics most business angel have, there exists also great heterogeneity among them. Although business angels usually invest in early-stage enterprises, there are also businesses angels that invest in such companies that experience positive cash flows even already at the time of the investment. Other angels have low involvement with founders and the companies they have invested in, while others actively invest also their own time. Angel investors differ a lot also by means of naivety, angel investment experience and sophistication among other aspects. These and many other features are specified below.

According to Mason (2005), a typical business angel has the following properties.

Male. Studies from across countries confirm that up to 95% of all business angels are males (Harrison and Mason, 2005; Mason, 2007).

In the 45–65 year age group. According to Mason (2005), this definition reflects the required length of time that is needed to build a significant personal net worth. Also at this age range people with a successful business career might chose, or are forced to, quit. Entrepreneurs that have cashed out and are in their middle-ages often became business angels since they get bored with all the spare time.

Successful cashed-out entrepreneurs. Many business angels have experience in building and growing an enterprise. Mason (2008; 11) retells Freer et al. (1992; 379) as follows. Angels “have acquired the kind of experience . . . that it takes to start, manage and harvest a successful entrepreneurial venture. In a sense their entire professional careers have prepared them to conduct the due diligence necessary to evaluate the merits and risks of prospective investments and to add value of their knowhow to the ventures they bankroll.” The rest of business angels are typically either people who have held senior positions in large companies or have specialist commercial skills and are involved in working with entrepreneurial companies (for example accountants, consultants, lawyers). Their wealth is derived from high income.

Well-educated. Business angels’ economic success is based on high education level. Business angels typically have a university degree and/or high professional qualifications.

During my research I noted the following: although research on angel investing has largely focused on Western developed economies, the above proposed characteristics are remarkably similar across countries. There appeared to be exceptions only in some Asian countries, including for example Japan (Tashiro 1999) and Singapore (Wong and Ho 2007).

The following categorization of angel investors follows Vasilescu (2009). The author classifies business angels by their *investor profiles*:

Corporate angels: A business angel who invests his severance or early-retirement payment. Corporate angel is usually a former senior manager from a large corporation. This type of investor is motivated to help others achieve what he has achieved and to generate greater financial returns from higher risk ventures;

Entrepreneurial angels: A successful, often former entrepreneur. This type of angel seeks to diversify his investment portfolio or to expand his current business. Angels belonging to this group are the most active ones and they also invest the largest amounts, generally up to \$500 000;

Professional angels: An angel investor who has achieved wealth and experience through his professional career as a doctor, lawyer, banker, an accountant or as a formal venture capitalist. Professional angel finds potential investment opportunities through his business dealings and professional networks. The business angel prefers to invest in such an enterprise that offers a service or a product that he has experience in. Professional angel usually offers his sector expertise to the investee firm and thus also engages with the business;

Enthusiast angels: Less professional investor (compared to the counterpart, the entrepreneurial angel) in his later years. He invests in firms more as a hobby;

Micromanagement angels: This type of an investor prefers great control over the firm he invests in. Micromanagement angel often micromanages from a seat on a company's board rather than through active participation in the everyday management.

Coveney and Moore (1998) grouped business angels based on their *level of entrepreneurial and investment activity*:

Entrepreneur angels: The most active business angel when measured by the number of investments made and the total amounts invested. Angel investors in this group are the most experienced and wealthy ones compared to the business angels in other groups. They prefer to invest in companies that are at the startup stage. The major motive behind the investment is enjoyment. Entrepreneur angels are the most probable ones to make investments outside of their own field of experience. They are unlikely to play a role in the day-to-day management of their investee companies.

Income seeking angels: Significantly less wealthy and active investors compared to the entrepreneurial angels. Income seeking angels are rather motivated by the job itself and income and less by the fun and enjoyment the investment project could generate. These angels tend to invest in industries which they are familiar with and they look for a formal management role in the ventures.

Wealth maximizing angels: Mainly self-made investors but the group includes also persons that have inherited their wealth. Wealth maximizing angels are interested primarily in the financial return. They usually invest in industries in which they have personal experience and they are likely to take a full-time position in their investee businesses.

The final classification is provided by Benjamin and Margulis (2005). They define business angels based on their *attitude and behavior*. Authors argue that business angels differ with their investment motivations; what they are looking for from an investment. Benjamin and Margulis (2005) divide the angel group into nine different types.

Value-added investor is an extremely experienced angel who has previously worked as an investment banker or venture capitalist. He has multiple investments at the same time and he spends time with the companies: value-added investor seeks to add value in the firms by contributing his accumulated knowhow in order to enhance the growth. Often this type of investor makes follow-on investments after a deep-pocket investor has invested much capital in a firm. Value-added investor seeks investment opportunities and often recommends investment targets to other investors. He has also a very strong network of co-investors who trust his judgment. Value-added investor is very active and he becomes involved often just for a little while.

Deep-pocket investor has a background as an entrepreneur. Usually he has built and sold a company and then uses the proceeds to help other entrepreneurs to become successful. This investor type requires

the return on investment (ROI) to be as high as 50% per year. Deep-pocket investor emphasizes deal structure, prefers that investor(s) holds control and invests only in firms he knows in order to avoid risk. This investor type makes independent decisions to invest, suggests investment targets to others and takes leads from other investors but always relies on own judgment.

The consortium of individual investors (could also be referred to as an informal syndicate) is a loose confederation of private, individual investors. They have experience in starting up, running and selling their businesses. Their activity level in the company is more of a passive: they seek oversight and work as sounding boards. Often the consortium invests in startup companies in technology, retailing and product areas. Although forming a consortium, business angels make their own decisions and may not always invest as a group. They are also actively connected with deep-pocket investors with whom they co-invest or to whom they refer deals.

The partner investor is described by Benjamin and Margulis (2005) as buyer in disguise. He has a very high need for control, he seeks presidency from an investee company and he prefers local companies so that he can participate. The partner investor is trying to build a network or has developed some co-investor relationships. The partner investor prefers acquisitions of established firms but usually lacks financial resources. He is the lead investor who searches for opportunities and makes independent decisions.

The family of investors pools family's money. Often a trusted and skilled family member coordinates investment activity. The family investor is very astute investor with high degree from school, at least the master of business administration (MBA). The investor contributes experience and intense involvement for a short period of time. The investor type is common among Asian investors in the US.

The barter investor provides, in exchange for equity, what the entrepreneur would otherwise have bought elsewhere. This type of investor has often everything to provide from billing, invoicing and collecting to warehousing and shipping. Thus besides capital, he invests infrastructure. The barter investor invests in early-stage companies and is actively involved in the firm. The barter investor requires a significant equity position in the investee company. The venture must have capacity to grow to \$10 million in minimum in three to five years.

Socially responsible private investor is nurture capitalist. He has a need for personal interactions and is less able to provide wise business support. Socially responsible private investor prefers to deal with entrepreneurs that have high values and ventures addressing major social issues. This type of investor usually does not have entrepreneurial background: his has a great amount of wealth which is typically inherited. Due to the lack of experience in business, he prefers to take advices and recommendations from trusted advisors.

The unaccredited private investor is typically less experienced and less wealthy individual than for example the value added investor. Despite of the inexperience he usually takes a role in a company. The investment period is quite small, from three to five years. The unaccredited private investor prefers to know the entrepreneur and he emphasizes the importance of a fair and hard-working owner. The investor makes multiple small investments ranging from \$10 000 to \$25 000.

The manager investor has worked as a senior-level executive or as a former business owner and after retiring has much wealth to invest in a venture company. However, the manager investor has low tolerance for risk so he invests in more developed ventures. Usually this type of investor buys a position: he wants a role in the company he is investing in for an extended period of time. He is less experienced and normally makes just one investment.

To conclude the chapter, I argue that it is obvious that business angels contribute much more than just financial aid in the investee enterprises. The entrepreneurs are expecting and demanding something that cannot be measured with currency and as they have revealed in many studies, entrepreneurs are looking for smart money and sector expertise from business angels. Thus in the relationship between the business angel and the entrepreneur there has to be other factors besides money business angels provide. The special factor creates so much value that the entrepreneurs are willing to pay for it and to hand over some power of the company. To my opinion, the missing factor is the experience, the knowhow and the hands-on work that the angels pass on. The above classification of business angels provide a firm ground to the argument that angel investors can and do provide *human and social capital*.

According to studies, the value adding contributions can be framed: the angel investor takes on one or more roles in the investee enterprise. The above mentioned factors, experience, knowhow and hands-on work that the entrepreneurs so often appreciate over capital, are conducted through the roles. The

next step in proving the value enhancing relationship between innovative microenterprises and economic growth and the all enabling influence business angels has on this relationship, is to discuss the value adding process.

4. Investment process and the value added by business angels

Before discussing the roles business angels perform, I briefly present the typical investment process proposed by literature and the agency problems that may prevail in the relationship between the business angel and the entrepreneur.

4.1 Stages of the investment process

According to Mason (2005 and 2009) and Haines et al. (2003) five discrete investment stages can be identified.

1. Deal origination
2. Deal evaluation, which can be divided into two sub-stages:
 - Initial screening
 - Detailed investigation
3. Negotiation and contracting
4. Post-investment involvement
5. Harvesting

Mason (2005) argues that agency theory provides a framework to study the above depicted investment process. According to the agency theory, an agency relationship exists when one individual (the principal) engages the services of another individual (the agent) to perform a service on his behalf. An important aspect of the agency relationship is that power, that is decision-making, and money are separated. It is precisely this separation of ownership and control that creates agency problems. In

practice, the principal, business angel, delegates the decision-making to the agent, the entrepreneur, while at the same time also capital is under the agent's authority.

According to Mason (2005), both the agent and the principal are assumed to be economic-maximizing individuals. The central concern of agency theory is opportunism. The separation of ownership and control creates risk that the agent will make decisions that are not in the best interests of the principal. This creates two types of risk for the principal. The first is *adverse selection*. Adverse selection results from informational asymmetries: the entrepreneur is better informed than the business angel about his true abilities. The entrepreneur may thus deliberately misrepresent his abilities to the angel investor. The second risk is *moral hazard*. In situations where it is not possible for the business angel to observe the behavior of the entrepreneur, the entrepreneur may shirk and engage in opportunistic behavior that is not in the interests of the angel investor. Also, he may pursue such interests that maximize his economic interest rather than that of the angel investor (Mason 2008). According to Mason (2005), these risks can be avoided by executing properly the investment process stages which are discussed next.

1. Deal origination

Mason (2005) argues that business angels adopt a relatively *ad hoc* and unscientific approach to identifying investment opportunities. Friends, family and business associates are the most significant sources of deal flow but angel investors receive business suggestions also from professional contacts like lawyers, accountants and stockbrokers as well directly from entrepreneurs. In some cases – especially in the case of *ad hoc* investors - the entrepreneur is not, according to Mason (2005), a stranger but a business associate who is known to the angel (client, supplier, among others). Since some studies clearly propose that angel investors rarely rely on public business suggestions, the sources of the suggestions must be included in the extensive and longstanding network of relationships (Mason 2005).

Mason (2005, 2008) found that the personal aspect of the deal referral minimizes especially the adverse selection risk. By investing in firms that are referred by trusted business associates, friends and even family members decrease the risk that the agent behaves incorrectly. As Mason (2008; 16) comments, “even if the principals of the firm are unknown to the investors, if the investor knows and trusts the referral source, the risk is reduced”. Business referrals put the referee's reputation, merits and credibility on the line, which then reduces the risk that the principal will behave incorrectly.

2. Deal evaluation

Deal evaluation includes at least two stages: initial screening and detailed investigation (due diligence). After receiving business proposals, business angels investigate how the proposals fit with their own investment criteria. The first and foremost factor that determines whether the investment opportunity is suitable or not includes the personal and business skills that the business angel itself possesses. If the investment opportunity does not match the skills and competences the angel has, he is unable to provide more than the capital asked. If the answer to question “can I add value to the business” is negative, the business proposal is rejected. So following Mason (2005)’s arguments, it seems that business angels have realistic knowledge of themselves and on average they do not take projects that go beyond their competence. Other meaningful factors that affect the choice of investment are the requested amount of capital, the location of the business and all the other personal criteria the business angel may have.

After initial screening the angel investor undertakes a quick review of the investment targets that fall within his investment criteria to derive some initial impressions. According to Mason (2005, 2008), the aim at this point of the decision-making process is simply to assess whether the proposal has sufficient merit to justify the investment of time to undertake a detailed evaluation. The market and the entrepreneur are the key considerations at this stage. Less significant are the product and/or service and financial factors (angels exhibit considerable skepticism about the value of financial information in the business plan of a startup company since the numbers are easy to come up with).

The objective of the initial screening is to filter the most promising and suitable investment targets from the mass of opportunities. If the business proposal is accepted to the next level of evaluation, business angel reads the business proposal in detail (indeed the business proposal is often viewed just now). Angel wades through the financial information, visits the premises, does some personal research to gather additional information on market potential, competition and so on, and assesses the principals.

3. Negotiation and contracting

In the negotiation and contracting phase, business angel and the entrepreneur agree on terms considering valuation, structure of the deal (share price, type of shares, size of shareholding, timing) and the terms and conditions of the investment, including the investor’s role. In coping with the agency

problems, deal structuring, the mechanism that decides how to allocate rewards between the investor and the entrepreneur, attempts to align the behavior of the entrepreneur with that of the investor. On the other hand, the terms and conditions attempt to control the behavior of the entrepreneur.

4. Post-investment involvement

From an agency perspective, monitoring is the most important tool for the principal to mitigate the risk of the agent's opportunistic behavior. According to Mason (2005), in line with this expectation, most business angels take an active role in the investee businesses.

The post-investment phase includes various conventions (could also be referred to as different roles) that the angel investor performs. The post-investment activities are discussed in detail in the next section that concentrates on the value added contributions.

5. Harvesting

As discussed earlier in the thesis, investing in startup and seed stage companies involves high risk (Mason 2005). The most accepted strategy by academicians and business professionals to reduce the risk of an investment is to diversify the investment portfolio (Brealey et al. 2008; Bodie et al. 2005). However, this is not an option for the business angel. According to Mason (2005), there are three reasons. For the first, angels typically have just a handful of investments in their portfolios. Second, they often restrict their investments to sectors they know and understand which makes their portfolios undiversified at the industry level. Third, as the first external investor in a business and generally lacking the financial resources to make follow-on investments, business angels are vulnerable to being diluted when further funding rounds are required.

The above claim about undiversified investment portfolios includes only investments made in certain type of enterprises (with certain type I refer to such companies that are usually the targets of informal venture financing, that is seed stage and startup companies in such sectors that the particular business angel has experience in). As stated in the presentation of business angels (section 3.3), the invested amount is often just from five to fifteen percentages of the total investment portfolio (for example Wetzel and Seymour 1981, and Shane and Heights 2008). To minimize the risks associated with undiversified investment portfolios, angel investors can follow the preferred investment theories by

investing in stocks, bonds, other debt instruments as well in art, apartments and other investment targets that do not correlate with angel investments.

To conclude I provide some numbers that indicate clearly the small amount of business plans that business angels eventually approve. According to Mason (2005), a Canadian study by Riding et al. (1993) found that 72,6% of business proposals were rejected at the initial screening stage and further 15,9% were rejected following more detailed investigation. As the detailed investigation stage proceeded, another 6,3% were eliminated. Thus the cumulative rejection rate was 94,8%. Business angels proceed to the negotiation and contracting stage with only 5% of the investment opportunities they receive.

4.2 The value added contributions by business angels

Politis (2008), among others, noted that even though it is widely recognized that business angels generally contribute value added in addition to the financial investments, there is very little detailed investigation about the means and methods how the value added actually takes place. To correct the deficiency in research, Politis (2008) searched for scholar studies by taking advantage of some of the most well-known and highly used databases¹³. She gathered studies from all over the world. The research process identified 14 empirical studies published between 1992 and 2005 that gave detailed information about the business angels' value added contributions and that also proved to be unbiased. The fourteen studies included data from the following countries among others: from the United Kingdom (Harrison and Mason 1992 and 1996), the United States (Ehrlich et al. 1994 and Ardichvili et al. 2002), Germany (Brettel 2003), Finland (Lumme, Mason, and Suomi 1998), Japan (Tashiro 1999), Scotland (Paul et al. 2003) and Norway (Sætre 2003).

Based on the fourteen research papers, Politis (2008) identified different hands-on actions business angels repeatedly seemed to perform. He aggregated the identified actions into a set of distinct but complementary value adding roles. Politis (2008) also linked the roles to theoretical perspectives that try to explain why the actions business angels take could have the potential to contribute to enhanced firm growth.

¹³ These include for example Elton B. Stephens Company (EBSCO), the American Economic Association's electronic bibliography (EconLit), Journal Storage (JSTOR) and British Library for Development Studies (BLDS).

For the first, I briefly present the Finnish study Politis (2008) included in his research. The Finnish study was conducted by Lumme, Mason and Suomi (1998). The authors found 22 different types of value adding contributions provided by business angels to their investee businesses. The 22 different types of contributions were divided into five main areas by the researchers that closely resemble the aggregated roles Politis (2008) suggests: strategic management and control, assistance in operational management and control systems, networking, industry knowledge and resourcing new dynamic business structures.

Politis (2008) identified four value adding roles:

- sounding board and strategic role;
- supervision and monitoring role;
- resource acquisition role; and
- mentoring role.

Following Politis (2008), I define the value adding roles and discuss also the links to the theoretical perspectives that explain why these roles have the potential to contribute to added value both at the firm and ultimately at the economy level.

Sounding board and strategic role

Politis (2008) found that the most frequently performed role reported in studies was acting as a sounding board. As a sounding board, the angel investor provides strategic advice to the entrepreneur based on his extensive business knowhow and management expertise that he has acquired during his career. Business angels perform the sounding board and strategic role in a number of ways. These include helping to formulate the business strategy, reflecting on ideas, enhancing the general pool of available management resources in the firm and giving advice on the manner and timing for how to realize the value created in the firm.

According to the 14 studies, the prior business experience and management knowhow provide an important basis for adding value. Angel investors possess unique personal capabilities that give business angels an opportunity to combine a wide set of diverse competencies that are related to the enterprise (the founder, existing and potential employees, the business idea among others) in order to generate a successful entrepreneurial venture.

Theoretically, the business angel's unique personal capabilities that contribute to value added in the investee enterprise can be explained by resource-based arguments. A firm's internal environment and especially internal resources and capabilities are critical for creating sustainable competitive advantage. As Politis (2008) noted, young small firms often lack these internal resources, particularly in critical management areas such as finance and marketing. The business knowhow and management expertise provided by business angels may in this respect be considered as a key strategic resource for the firm. From the perspective of the resource-based theory, business angel's human capital is a potential source of competitive advantage which could improve the investee firm's competitive position.

Supervision and monitoring role

According to Politis (2008), the 14 studies revealed that supervision and monitoring role is the second most common form of value adding. The supervision and monitoring role is related to some extent to the principal-agent theory discussed briefly earlier. By supervising and monitoring the firm, business angel protects the investments made by the enterprise's main resource providers (for example equity and debt holders, and employees) from the potential managerial misbehavior. Monitoring is commonly performed by instituting proper accounting information systems and by serving on the board of directors in the investee firms. According to Politis (2008), financial information and other checks among others enable the business angel to protect the assets of the firm, oversee operating matters and hold managers accountable for their actions.

Supervision and monitoring role can be theoretically linked to agency theory arguments (Politis 2008). The separation of ownership from day-to-day decision making creates principal-agent relationship and induces agency problems between the parties. To reduce potential agency costs and maximize shareholder value, agency theory prescribes that outside investors should be actively involved in supervision and monitoring activities. Business angels may be expected to add value by exercising these activities to help to minimize potential asymmetric information problems and to reduce agency costs.

Resource acquisition role

The third activity angel investors perform is resource acquisition. Business angels add value to the investee companies by acquiring timely resources through their personal networks. Among others, timely resources include activities such as interfacing with investor groups, providing important business

contacts and raising additional funds (Politis 2008). The networking activities can be helpful in supporting the early development and growth of new small firms by developing and managing their network of connections with important stakeholders. Entrepreneurs are better prepared and informed of unexpected opportunities that arise in the marketplace, *strategic windows* (Politis 2008).

Politis (2008) links the resource acquisition role to resource dependency perspective. The perspective emphasizes that the long-term survival and success of a firm depends on its ability to link with its external environment. According to the theory, a firm that wants to reduce dependency on resources should pay attention to critical relationships, assets and contacts in the external environment. By forming healthy, tight relationships, and acquiring strategically necessary assets and contacts, a firm is less dependent on external forces and variables that could in worst case affect the core business itself.

Mentoring role

The fourth value adding role is mentoring. Mentoring activities refer to the developmental relationship between the more experienced angel investor and the less experienced entrepreneur (Politis 2008). Business angel aims to build a stable and committed working relationship with the entrepreneur and according to the studies, angel investor is seen as a helpful, open and trustworthy partner. The activities reported in the studies included “providing moral support, lifting the spirits, sharing the burden, providing a broader view, and discussing and dealing with sensitive personal issues” (Politis 2008; 10). These mentoring activities can support important business operations, such as joint planning and problem solving based on social and relational methods.

Mentoring role can be related to theories of relational governance¹⁴. Agency theorists emphasize mainly formally defined contracts to protect the equity investment. On the contrary, relational governance theorists argue on behalf of the importance of norm-driven definitions of proper behavior. The norm-driven definitions are seen to regulate social relationships and social exchange between economic agents. The ongoing functional relationship between the entrepreneur and the angel investor will generally foster trust and enable the parties to build confidence between them and also to adopt more flexible models of partner cooperation. When there is a possibility of conflicting interest in the partnership, relational governance mechanisms become a necessary and efficient complement to formal

¹⁴ More about relational governance can be found from e.g. Huse (1993) and Grandori (2006).

contracting mechanisms. Relational governance enhances continuance, reciprocity and bilateralism. Thus regarding to the relational governance perspective, business angel adds value with the mentoring role by instituting shared vision, mutual understanding and trust in the relationship between him and the entrepreneur. This in turn has the potential to reduce harmful conflicts and promote cohesion and long-term commitment (Politis 2008).

Table 1 summarizes the four value adding roles and the theoretical perspectives.

Value adding role	How do business angels add value?	Theoretical support
Sounding board/strategic role	Building and protecting the bundle of valuable resources in the firm	Resource based theory
Supervision and monitoring role	Minimizing conflicts of interest by means of formal control mechanisms	Agency theory
Resource acquisition role	Creating and maintaining a stable flow of critical resources	Resource dependency theory
Mentoring role	Minimizing conflicts of interest by means of informal control mechanisms	Theories of relational governance

Table 1. Theoretical perspectives on how business angels add value (Politis 2008)

To sum up I briefly present the above discussed four actions in two major dimensions which further proposes that the roles are complementary and linked to each other, in addition to been distinct (figure 9).

According to Politis (2008), the roles can be classified on the basis of their emphasis on value added. She notes that the role is either constructing a competitive resource base in a firm or governing the relationship between the business angel and the entrepreneur. The value added contributions that focus on securing the firm's resources are *the sounding board and strategic role* and *the resource acquisition role*. The two remaining roles form the "governing the relationship between the organizational actors" dimension (Politis 2008; 12).

The second dimension classifies the contribution of the business angel itself. The angel investor has personal assets, social and human capital, that he has acquired throughout his professional career. Through different jobs, training and experience business angel has acquired human capital. It can be defined as a set of productive knowledge and skills. Social capital, on the other hand, can be defined as the location of an individual in a structure of relationships. This location can be very advantageous for the entrepreneur, since usually he has not yet itself reached such a position in a network of relationships. *The sounding board and strategic role* and *the supervision and monitoring role* relate to human capital and *the resource acquisition role* and *the mentoring role* to social capital (Politis 2008).

Value added based on human capital Value added based on social capital

Resource provision	Sounding board/ strategic role	Resource acquisition role
Governance	Supervision and monitoring role	Mentoring role

Figure 11. The value added roles and the two major dimensions (Politis 2008)

The particular link between business angels and the enhanced business growth is empirically verified by many studies. In the current chapter, one part of the link is argued to be the angel investor's personal involvement with the investee enterprise.

In the next chapter, I present studies that have empirically confirmed the relationship between business angel investments, microenterprises and enhanced growth, both at the firm and the economy level. The aim of the chapter is to provide statistical support for my argument about the positive impact business angels have on growth levels. The presentation also verifies the importance of microenterprises for the wellbeing of a nation as well for the economic development since the higher growth rates witnessed in studies are related to young innovative microenterprises. The argument that microenterprises might be among the most important growth drivers in nations is supported by the empirical findings.

5. The empirical evidence on the impact of informal capital on economic growth

5.1 Measurement issues

As noted earlier, business angels are keen on their privacy and anonymity. Also, according to Mason (2008), business angels can be described as invisible and as it follows, there is no documentation of the nature of their investing. As opposite to the formal venture capital market, there are no lists or databases of business angels. Thus already Wetzel (1983; 26) observed, that the total population of business angels “is unknown and probably unknowable.” Also, earlier research on business angels characterizes them with inconsistent definitions and this obviously hinders knowledge accumulation and future empirical research¹⁵.

There are two consequences that follow from the preference for anonymity (Mason 2008). First, at the macro scale it has not been possible to accurately measure the number of business angels or their investment activity on either cross-sectional (static) or time-series basis. Also, even the population of business angels is not fixed or static. As Mason (2008) argues, there are several studies that have identified a significant minority of virgin angels who actively look for their first investment targets. Second, micro scale research on business angels has had to identify business angels through a variety of imperfect sources. According to Mason (2008), as a result there is no way in which to test for the representativeness of the generated business angel samples. Indeed, many studies are based on samples of convenience. These samples include for example angels who are members of business angel networks or such angels that are sampled by snowball sampling methods (chain-referral). Both methods are likely to generate biased samples¹⁶. The difficulties in finding business angels has also meant that most samples are small, which also relates to the representativeness problem. However, progress is

¹⁵ Avdeitchikova et al. (2008) made a thorough investigation of the definitional obstacles of business angels as well of the grey area and sampling methods suggested and revealed by earlier research. More information about the subject can be found from their article.

¹⁶ Snowball sampling method is a research sampling technique that is used with hidden populations. In the snowball sampling technique, existing research participants recruit possible future subjects among their acquaintances. As a result, the sample group appears to grow like a rolling snowball (Salganik and Heckathorn 2004). Research points that the snowball method is likely to be biased but however, there are other techniques emerging. These include respondent-driven sampling technique which, according to Salganik and Heckathorn (2004) and Heckathorn (2007), allows researchers to make asymptotically unbiased estimates about hidden populations.

constantly being made with such data sources that enable more accurate estimates of the researched population (e.g. Avdeitchikova et al (2008); Farrell et al. 2008; Riding 2008).

As a result of the anonymity, there has to be at most only a few macro level studies that include purely business angels in the sample group. Unfortunately, I was not able to find any. Thus some of the following presentation of the impacts venture capital has on economic growth includes all venture capitalists. Nevertheless, I find it useful to shortly discuss the results since they are highly convincing. Also as presented earlier, formal (especially private formal venture capitalists) and informal venture capitalists provide similar value adding contributions for the investee enterprises and thus the results should be in line with the effects business angels alone are expected to provide.

According to numerous studies, the reason why venture capitalists are assumed to impact the economic growth rates and the success of an enterprise are similar to the arguments I have given about the effects business angels have. These include first of all capital and for the second, the personal involvement of the investor. Thus, the factors behind the positive results found in empirical studies are similar to the factors business angels are proposed to contribute.

As a convincing argument, I briefly discuss the findings by Luukkonen (2008). She compared the different contributions and activity levels formal and informal venture capitalists culminate in the investee firm. She found that business angels are actively “coaching” the investee firms which could relate to the roles discussed in the previous chapter. The public sector venture capital organizations were least involved with the investee enterprises as well as least active in the “coaching” activities. On the other hand, private sector venture capitalists took advantage of formal control and monitoring mechanisms. Similarly to business angels, private venture capitalists were actively involved in “coaching” the investee enterprises (Luukkonen 2008). The research clearly indicates that the activities conducted by formal venture capitalists, especially by private venture capitalists, are similar to the ones conducted by business angels.

In addition, despite both, formal and informal venture capitalists provide important knowledge in the form of human capital, to my opinion it is obvious that business angels tend to contribute it more and also more intensively. Literature suggests that angel investors usually have at most few ongoing investments at the same time which makes them more concentrated on one single firm at a time. Also the motivation to enhance firm growth is much stronger since it is business angels’ own money that is at

stake: the upside and downside potentials are enormous and the effect runs directly to the business angel (in contrast to a fund or institution manager). In addition, many business angels make investments since by investing, they are able to engage with businesses and help the entrepreneur make the enterprise successful, and for many angels that is the main goal (Mason 2005, 2008 among others). The institutional venture capitalists invest in enterprises because it is their job and this makes an enormous difference between the two investments. Due to the above argumentation, the intensity level that the formal and informal venture capitalists contribute is different, which to my opinion has an effect on how much effort they are actually contributing. The effects could be seen at last in the different growth rates the investee enterprises are performing. In fact, I assume that if the studies were made only with business angels, the results would be more extreme.

In the second chapter I introduced the endogenous growth theory of entrepreneurship as a proper and useful measuring and modeling tool for the effects entrepreneurship has on economic growth. As I argued already in the actual presentation of the theory, a new variable should be introduced in the model for it to better reflect the environment microenterprises are in and also the obstacles they face. I proposed that the new variable, f , should depict the financial environment. The production function in the endogenous growth theory of entrepreneurship is $Y = K^\alpha (\theta_r A)^{(1-\alpha)} L_Y^{(1-\alpha)}$. The new variable affects only new microenterprises and thus it should affect the term $\theta_r A$. I propose that f should be added to the power term as follows: $Y = K^\alpha (\theta_r A)^{(1-\alpha-f)} L_Y^{(1-\alpha)}$, since the financial environment restrains the new microenterprise sector from functioning efficiently.

5.2 The micro level evidence on the superior performance of business angel backed firms

A vast amount of recent empirical research confirms the relationship between receiving venture capital and firm performance (e.g. Engel 2002; Schefczyk 2000). Engel (2002) studied the impact venture capital has on firm performance. The study confirmed that enterprises financed with venture capital actually do perform better due to the involvement of the venture capitalist. Engel (2002) as well as Berger and Udell (1998) and Gompers and Lerner (1999) emphasize three reasons why venture backed firms outperform non-venture backed firms: pre-investment screening, monitoring and value adding. According to Engel (2002) and Sapienza (1992), given a positive relationship between the services venture investors provide and the performance of an enterprise, the impact on firm performance is supposed to be larger in firms

with a high innovation level. Due to this finding, Engel (2002) and Sapienza (1992) argue that the venture capitalists role in an enterprise increases with the innovation level of the company.

Engel (2002) studied the impact of venture capital on new firm growth. As an indicator for growth, Engel (2002) used employment data. According to the results, venture capitalists push the investee firms to a faster and higher growth than any other investor during a specified amount of time. The empirical results indicate that venture backed firms in high-tech industries achieved 42% annual employment growth rates (non-venture backed achieved only 14% growth rates). In addition, venture capital backed enterprises had 110% higher firm growth rates in relation to the group of non-venture backed firms with a similar amount of business activities in the high-tech industry.

Hunter and Clarke (2009) have conducted the United Kingdom's (the UK) largest study to date about the effects business angels have on the economic performance of enterprises. The research also gives information about the return rates business angels experience with their investments. The study included only business angels that were members of business angel networks and thus the results must be interpreted in the light of the sample limitations. However, the conclusions are similar to other studies and are well worth presenting.

Hunter and Clarke (2009) came across the following findings. The most likely outcome of an investment is failure. 56% of the investments made were exited with a loss, most of them losing the whole investment. This finding contributes to the acknowledged fact that business angel investment is highly risky. The rest, 44% of investments exited with substantial gains. The average of the liquidated capital was 2,2 times the invested capital. In their sample, 35% of all exits made solid returns generating from one to five times the invested capital. 9% of the exits generated ten times the invested amount. On average, the investment period was 3,6 years and the average investment had internal rate of return (IRR)¹⁷ as high as 22%. Similar numbers are also available for the United States (Hunter and Clarke 2009). For comparison, the average of the income generated by a successfully made exit was 2,6 times the investment, the average investment period being 3,5 years and the average IRR 27%.

A similar study is conducted in Canada by Riding (2008). He found that business angels exit their investments with a loss in 26,7% of investment cases. The figure is clearly much smaller for the Canadian

¹⁷ The definition for IRR can be found from Brealey, R., Myers, S & Allen, F (2008).

business angels than for the UK angels discussed above. 40,7% of the investments yield from 1% to 50% on the investments and 32,6% yield more than 50% on the investment.

The internal rate of return (IRR) can be used as a measure of firm growth. Mason and Harrison (2000), among others, suggest that the investment projects business angels make yield high returns. Mason and Harrison (2000) found that the distribution of returns was highly skewed. 34% of exits were made with total loss and 13% at partial loss or break-even, but 23% gained an IRR of 50% or above. They studied also how the rates of returns differed between business angels and portfolio managers that invested in seed stage and startup companies. Business angels had significantly fewer investments that generated negative returns and a significantly higher proportion that broke even or generated moderate returns (0–49% IRR) than portfolio managers had.

Deriving conclusions from the above studies, business angel investments can be viewed as highly risky but when successful, the profits are extremely worthwhile. According to Hunter and Clarke (2009), an appealing aspect of early-stage investing is that the size of loss is only up to the total amount invested but the size of gain is genuinely uncapped.

Hunter and Clarke (2009) found also that there are some key strategic choices that are significantly related to better investment outcomes. For the first, angels with entrepreneurial expertise outperformed those without it, especially in earlier-stage enterprises. For the second, more than half of the investments were very early-stage, going into pre-revenue ventures. For the third, the angels who invested in such enterprises where they had specific industry expertise failed significantly less. Also the angels who performed at least some due diligence experienced fewer failed investments. I think that these strategic choices presented above as well by Engel (2002), Berger and Udell (1998) and Gompers and Lerner (1999), relate closely to the business angel attributes that are presented as favorable features in the thesis.

From literature, there can be found numerous studies that suggest venture financing to increase growth at the firm level. This include Manigart and Van Hyfte (1999), Engel and Keilbach (2007), Jain and Kini (1995) and Colombo and Grilli (2008), among others (Wright and Chopraa 2009). However, there are also studies that suggest there to be no effect at all. These include Burgel et al. (2000) and Botazzi and Da Rin (2002) among others (Wright and Chopraa 2009). Despite the mixed results, there are convincing

results in the empirical research indicating that venture financing enhances firm growth. That is also the conclusion of the thesis.

5.3 The macro level evidence on the superior performance of business angel backed firms

A research by Alemany and Marti (2005) intended to confirm the following intuition: firms that receive venture capital have a greater economic impact than similar firms financed with other kinds of capital, and that venture capital financing has significant and positive effect on this greater economic impact. In their research, the economic impact is measured by the development of some economic variables in venture capital firms. In particular, employment, sales, gross margin, total assets, net intangible assets and corporate taxes are the possible variables that could capture the economical impacts. Net intangible assets are included in the study since they can be used as a measure of innovations. Indeed, in numerous studies innovations are assumed to exhibit the growth in the new firm sector.

The results from the analysis are convincing. They confirm the superior economic impact of venture capital backed companies in all variables analyzed, except for corporate taxes, compared to the control group (it is natural that during high growth taxable income reduces significantly). The annual growth rates of the studied variables during the time period venture investors were involved with the firm are (in brackets the growth numbers for the control group): sales 23,8% (8,1%), gross margin 18,8% (5,2%), total assets 26,1% (8,3%), intangible assets 45,8% (21,5%) and employment 19% (2,3%). All the results are significant either at the 1% or 5% levels except for total assets and employment in the startup stage companies.

Alemany and Marti (2005) analyzed also how the impact of venture capitalists differed across different stages of firm development. The biggest effects were in the group "startup". The only variable that experienced larger values in the "growth stage" group compared to the startup was total assets. They did not find differences in measured variables between the control group and the venture capital backed enterprise in group "late stage". Thus it is a well-grounded argument that venture capitalists add value the most in microenterprises.

The main goal Alemany and Marti (2005) pursued was to empirically prove that venture capital backed companies have a greater impact on aggregate economic growth than firms financed with other sources

of capital. The results are convincing: the coefficient of the GDP's natural logarithm is positive and significant at the 1% level. The empirical model found a significant and positive relation between the cumulative venture capital investment and the growth in the analyzed variables.

To sum up, Alemany and Marti (2005) found evidence that employment, sales, gross margin, total assets, intangible assets and corporate taxes grow faster in firms that receive venture capital. The result is verified as a higher growth rates in those variables in a sample of venture capital backed companies, over a three-year period, comparable to non-venture capital backed firms. Also, the empirical model found a significant, positive relation between the cumulative venture capital investment in a firm and the growth in employment, sales, gross margin, total assets, intangible assets and corporate taxes in the aggregate economy.

The European Central Bank conducted a study that investigated how private equity investments affect new business creation in Europe. The researchers, Popov and Roosenboom (2009), took advantage of a comprehensive database of European firms in order to study how firm entry rate is affected by private equity investments. The researchers used cross-country cross-industry regression analysis. Data on entry of new firms was gathered from Amadeus and on private equity investment from European Venture Capital Association (EVCA).

Popov and Roosenboom (2009) found that the coefficient on the interaction term between private equity investment and the birth of new enterprises was significantly positive. According to the researchers, the result implies that the entry of new firms in naturally high-entry and R&D-intensive industries is significantly higher in countries that have larger amounts of private equity investments relative to the gross domestic product. They argue that the result is particularly true for smaller firms.

6. Conclusions

6.1 Microenterprises and new knowledge as the explanatory factors of economic growth

The aim of the thesis was to argue that today the traditional neoclassical growth theory, the Solow model and the more modern one, the endogenous growth theory, incompletely take into account economic growth drivers. The Solow model as well the endogenous growth theory does not take into

account the mechanism that transforms new knowledge into commercial opportunities. The mechanism that takes advantage of the spilled over knowledge is a new enterprise. The modified version of the endogenous growth theory, the endogenous growth theory of entrepreneurship proposes that new enterprises are needed to take advantage of the new knowledge: without enterprises that emerge, take on risks, pursue opportunities and profits and sometimes exit, economies are unable to utilize new innovations and knowledge.

In the endogenous growth theory of entrepreneurship knowledge filter creates entrepreneurial opportunities. The knowledge filter depicts the assumptions that not all knowledge is commercially useful and that there are some individuals in a society that are able to utilize the knowledge. The personal attributes of individuals affect their possibilities to draw from the new knowledge.

The following conclusion is made in the thesis: the neoclassical growth models and the endogenous growth theory do not measure economic growth today properly since the underlying assumptions do not depict the reality. On the other hand, the endogenous growth theory of entrepreneurship has altered the faulty assumptions. The altered assumptions seem to be relevant and properly reflecting the economic conditions. The production of knowledge, the attributes of the produced knowledge, the knowledge filter and the assumption regarding knowledge spillovers as well entrepreneurs are built in the model. These are all such elements that are related to the innovation and entrepreneurial processes that depict microenterprise sector today.

However, the endogenous growth theory of entrepreneurship does not take into account the decision process of becoming an entrepreneur. It is a revolutionary decision that a current employee has to make and there are many factors affecting the result of that decision. The model also lacks the policy actions and other environmental issues that could influence the surroundings the enterprise is working in. Also, the financial difficulties that the new enterprises face have undoubtedly impact on the economical performance both at the firm and the economy level. In the models depicting new enterprises such variable that measures the financial environment could be very advantageous for the explanatory strength of the model. Thus, new variable should be added in the model: f that measures the impact that the financial situation has on the rate at which new enterprises are born and on their survival.

6.2 The contribution of business angels on the growth rate of microenterprises and ultimately on national economies

As noted by literature and empirical research, microenterprises are an important source of economic growth. However, problems arise when the microenterprises are seeking for investment capital that is a necessary condition for the microenterprises to grow. Commercial banks and venture capital institutions that usually provide investment capital for more established enterprises refuse to lend to microenterprises. The reasons behind the refusal have to do with the extremely high risk level that such enterprises have and also with the lack of collaterals and cash buffers.

Without business angels, microenterprises would be unable to receive capital and grow. As the thesis proposes, business angels provide the necessary capital and in addition, their accumulated human and social capital. The business angel characteristics and the value added roles they perform in the investee firms enhance the firm growth rate. As a conclusion, economies would grow with much higher rates if business angels and entrepreneurs would find each other with higher probabilities. Also the opposite is true: if there are no business angels that provide financing and human capital, there is much less growth in nations.

The value added business angels contribute to the investee enterprises arises from the strong business knowhow. Business angels do not often participate with enterprises on a daily basis. Rather they concentrate on giving advice in the strategic matters and on providing both capital and their social network for the enterprise when needed.

Business angels have the potential to enhance the efficiency of the financial markets and to fulfill the deficiencies in knowledge. Business angels are also able to enhance the economic performance of the investee firms. The only problem is that there are not many such enterprises that are willing to grow. Indeed, the Finnish enterprises regard growth negatively since the entrepreneurs tend to be risk averse. Thus the potential of business angels will be utilized in the Finnish economy only when the enterprises are utilizing their growth potential. These are clearly such points that should be addressed by those authorities that are concerned with the Finnish economic development.

6.3 Future research suggestions

The research on business angel investments is young. Much of the literature describes the phenomenon and since the business angel sector is highly anonymous, there is very little empirical research. The problems with biasness also decrease the number of remarkable studies in the field. Thus to depict a better and more comprehensive picture of business angel activities and their consequences, more relevant and reliable empirical research is needed, especially at the macro level. Also the theoretical perspective of the micro and macro level actions and impacts is not yet clear.

Although there are studies regarding the micro effects business angels have, the effects are measured only at most at the medium-term. The young nature of the business angel research affects the term that the effects can be measured. Thus an obvious future research target should be the long-term effects business angels have on the investee enterprises.

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