GROWTH AND VENTURE CAPITAL INVESTMENT POTENTIAL FOR UNIVERSITY SPIN-OFFS IN HUNGARY

Patrícia Becsky-Nagy

University of debrecen Department of applied economics and rural development
Faculty of accounting and finance

Abstract: Venture backed spin-offs represent a low proportion of companies, even of innovative companies. The research question was, whether these companies have an important role in innovation and economic growth. I present the most important indicators of innovation in connection with entrepreneurship, the measures of start-ups, mainly the high-tech ones. I describe the position of venture capital industry nowadays, detailing the classical venture capital investments, targeting high-growth potential small firms, even university spin-offs.

The study presents the results of a survey made as a counterpart of an academic research team, examining spin-offs, entrepreneurs and technology transfer in the most important Hungarian universities.

I found that the most important obstacles of venture capital investments in high-tech spin-offs are the information gap between demand and supply side, the lack of entrepreneurs' willingness to give up freedom in decision making, despite of low managerial skills. The low quality of financial environment is also an obstacle of the segment.

Key words: venture capital, spin-off
JEL classification codes: G24, M13

The global financial and economic crisis has increased attention on entrepreneurship as an important source of innovation and economic growth. By the process of innovation ideas are generated and commercialized. University technology transfer utilizing state-financed research is a possible form of commercializing innovations. Spin-offs with high growth potential can mean possible targets of venture capital, so in this way venture capital backed spin-offs can be a potential source of economic growth.

The university spin-offs have two basic forms: selling patented intellectual property of research results or founding a spin-off company based on patents (Lengyel, 2012). Spin-offs with high growth potential are likely to find venture capital background for financing growth and entering international markets.

The institutional venture capital and private equity investments are professionally managed capital investments in firms not listed on stock exchange, where the professional management is provided by specialized mediators. General partners raise funds, collecting capital from individuals and institutional investors (from limited partners) to invest in portfolio companies not listed on stock exchange. Hands on investment means that investors (general partners) play an important role personally in the management of the portfolio companies. The principal goal of this long-term investment is the capital income yield during the exit, selling stocks on a higher exchange rate (Prowse, 1998; Karsai, 1997; Becskyné, 2008).

As a member of a research group, I examined, whether Hungarian spin-off companies were able to find venture capital investors, and whether it lead to the growth of the company and its markets.

In the first part of the article I present the status of the most important indicators in connection with entrepreneurship, than I write about the measures of start-ups, especially with high-growth potential. I also describe the venture capital investments' rates differing classical venture capital investments, that points out the number and the amount of venture capital investments financing early stage firms with high-growth potential.

In the second part I show the results of my research about the growth potential and financing of Hungarian spin-off's. I summarize the obstacles of Hungarian spin-off's growth and involvement of venture capital.

The Hungarian innovation system has developed continuously despite of the crisis. In the Global Innovation Index (GII) Switzerland, Sweden and the United Kingdom ranked the first three spots. Hungary is positioned by the

Global Innovation Report 2013 as an innovation learner, an efficient innovator, and is among the eighteen[1] emerging, high- and middle income economies, as a high income one. These economies are rapidly improving the innovation capabilities, demonstrating a 10% or more higher level of innovation compared with other counties with similar income levels as a result of good policies of institutions, skilled labor force, innovation infrastructures, integration with global markets and linkages to the business community. Hungary ranked first in the world in the Audiovisual &Related services exports index, and is among the first ten in FDI net outflows (%GDP) (ranks 5th), Knowledge absorption (rank 6th), Creative goods exports (%) (ranks 7th), and as a total index of Knowledge & technology outputs it ranks 13th. The indexes also shows what has to be learned or developed in Hungary: in the Market sophistication index Hungary ranked the 87th spot, because of the low rankings of Microfinance gross loans, Investments, the Ease of protecting investors and the Market capitalization, where the country ranked around 100th (Cornell University, INSEAD, and WIPO, 2013).

In Hungary some special innovation factors are among the bests in the OECD countries, e.g. the Audiovisual & related services exports, FDI net outflows, Knowledge absorption etc., but we have to learn more in the field of Microfinance gross loans, investments, ease of protecting investors and market capitalization. So in case the financial environment strengthened, taking advantage of special benefits, there would be more innovative venture backed firms. The changes in financial situation concerned the parameters illustrating the management of the enterprises, influenced the competitiveness, profitability, effectiveness, etc. (Herczeg, 2009, Fenyves-Tarnóczi, 2011, Orbán, 2003).

In this learning process innovation hubs would mean an important supporting role. Innovation hubs can help in creating a differentiating capabilities system that offers a sustainable competitive advantage. In the innovation hubs, like Silicon Valley, hundreds of ideas are generated, and as there are prospering companies, more and more amounts are invested in research and development, accelerating the process of new product creation. Public and private sectors have important roles in developing an appropriate innovation ecosystem, in order to support innovations (Cornell University, INSEAD, and WIPO, 2013).

Entrepreneurship as a source of innovation

According to the survey Flash Eurobarometer Entrepreneurship in the EU and beyond published by the European Commission in 2010 87% of respondents answered, that the appropriate business idea was important, during the decision making of starting a business. 84% of the respondents answered, that it was important to have the necessary financial resources.

The survey examined the reasons for preferring self-employment. The reason "personal independence, self-fulfillment and the chance to do something of personal interest" ranged from 43-45% in Iceland and Japan, to 83% in Hungary. The "better income prospects" was the second most popular reason among Hungarian respondents, reaching the highest rate ranking from 4% in Finland to 60% in Hungary. The "freedom to choose their own place and time of work" ranged from 18%-21% in Greece and Germany to 68% mentioned in Luxemburg. In Hungary 48% of respondents chose this reason. Hungarian respondent were the most likely (26%) to say that they would prefer self-employment to be able to realize a particular business opportunity (European Commission, 2010).

According to this survey, Hungarian respondent's entrepreneurial motivations are mostly defined by the personal independence, self-fulfillment and the chance to do something of personal interest and better income prospects. The freedom to choose their own place and time of work is also an important reason to become an entrepreneur. In this interpretation, innovation is not among the motivators of most entrepreneurs, but entrepreneurs founding high-growth potential firms can create a special segment of companies.

Status of start-ups especially for high growth potential

The recent crisis, characterized by tighter credit restrictions, has arguably hampered new start-ups and impeded growth in existing start-ups as well as their ability to survive in tough market conditions. The significant rise in business closures, especially of micro and small enterprises, in recent years, bears stark witness to these difficult conditions and highlights the need for statistics on entrepreneurship that can support policy makers. Entrepreneurship at a Glance contains a wide range of internationally comparable measures of entrepreneurship designed to meet this need.

According to the survey made on behalf of the OECD (Entrepreneurship at a Glance 2013), the start-up rates still remain below pre-crisis levels in most Euro area economies, but tentative signs of stabilization are emerging. The high-growth enterprises generally represent on average only a small share of the whole enterprise population, ranging from 2% to 4% for most counties, measured on the basis of employment growth. On the basis of turnover the shares were twice as high, but both measures were still lower than in 2006 in almost all counties. The share of high-growth firms were higher in the service sector, than in manufacturing, in all counties for the measures based either on employment or on turnover. The rates of Hungary were around average (OECD, 2013).

[1]The eighteen countries are: the Republic of Moldova, China, India, Uganda, Armenia, Viet Nam, Malaysia, Jordan, Mongolia, Mali, Kenya, Senegal, Hungary, Georgia, Montenegro, Costa Rica, Tajikistan and Latvia

Status of venture capital investments especially for classical ones

According to the empirical evidences provided by Ortin-Angel and Vendrell-Herreto (Ortin-Angel – Vendrell-Herreto, 2009) young university spin-offs attract more venture capitalists than other technological start-ups, explained mainly by the lack of managerial skills among these firms' founders. Others found that founders of university spin-offs have higher formal education levels (Siegel-Waldman-Link, 2003), but fewer managerial skills than founders of other start-ups (Shane 2004, Vohora-Wright-Lockett, 2004). Initial studies found, that venture capital investors prefer financing founders with higher qualification (Macmillan-Siegel-Subbanarasimha 1985, Birley-Lelelux, 1996, Shepherd-Ettenson, Crouch, 2000). At the same time the entrepreneurs prefer preserving decision-making control and ownership, so they involve venture capital, only when it is necessary. But if it is necessary, they are ready to do it in the shortest possible time (Bácsné, 2011).

In the majority of OECD countries, venture capital investments represent a very small percentage of GDP, e.g. often less than 0.03%. Israel and the United States have outstanding rates, 0.5% and 0.2% of GDP respectively, that indicates a mature venture capital industry in these two countries. Parallel the crisis has affected the venture capital industry in all OECD countries, and the level of venture capital investments was around 60% of the levels measured is 2007 in most counties, only in Ireland and Luxemburg exceeded the pre-crisis level.

40% and 30% of venture capital investments in the US and in Europe were made on the field of life sciences. Investments target companies in their start-up and later-stage ventures; and only a very small number of companies are backed by venture capital (OECD, 2013).

Zhang (2008) found that university spin-offs have higher survival rate, but in terms of the amount of venture capital raised university spin-offs do not show significant differences, such as the probability of IPOs, making profit or the size of employment.

The size of the Hungarian venture capital and private equity industry (VC&PE industry) measured as "a percentage of the value of investments into companies headquartered in Hungary as a proportion of the country's GDP" (Karsai, 2013, pp. 25) Hungary had a prominent rate among the EU and even among the OECD members (OECD, 2013), although for the investment/GDP the ranking of Hungary has dropped from the fifth in 2006 to the 22nd in 2010. However the size of the venture capital and private equity market had high rankings, usually it was influenced by high value individual buyouts (Karsai, 2013).

The Hungarian classical venture capital market, financing small and medium size enterprises with a high growth potential, has usually got the lowest rankings in Europe, typically below 10% of the EU average. In the period 1989-2010 approximately half thousand investments were made in classical venture capital investments in Hungary. The number of enterprises getting venture capital during the twenty year period was only 0,2% of the double entry bookkeeping enterprises in Hungary, though in the EU 6% of the small and medium sized enterprises got venture investment. According to the OECD survey the number of venture backed company rate per 1000 enterprises was 0,02, though the OECD rate was around 0,28. These low rates are because of the relatively young venture capital market and less developed capital market. According to Hungarian researches the barriers of the classic venture capital investments are not deriving from the supply side, but the demand side (Karsai, 2013).

According to a survey made in 2008 (Szerb, 2009) only 0,25% of Hungarian SMEs, are suitable for VC investments, and the potential targets of institutional and venture capital investors are around 400 to 600 firms. Before the dot.com bubble the lack of these investments were caused by low quality management. According to the recent surveys, the barriers of the investments are not only the information gap between the demand and the supply side, and the lack of the

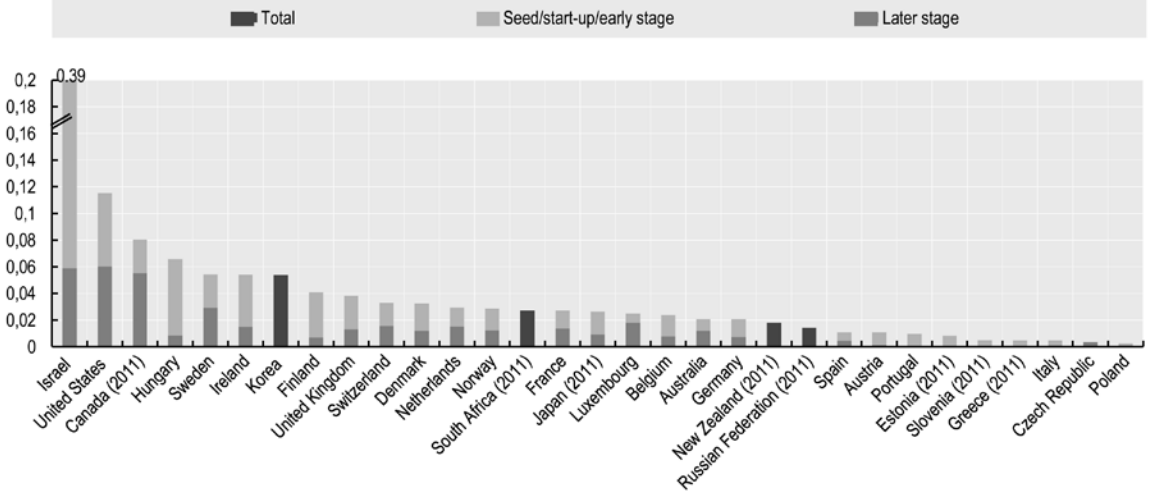

Figure 1: Venture capital investments as a percentage of GDP (US dollars current prices), Percentage, 2012
Source: Entrepreneurship at a Glance 2013 – © OECD 2013

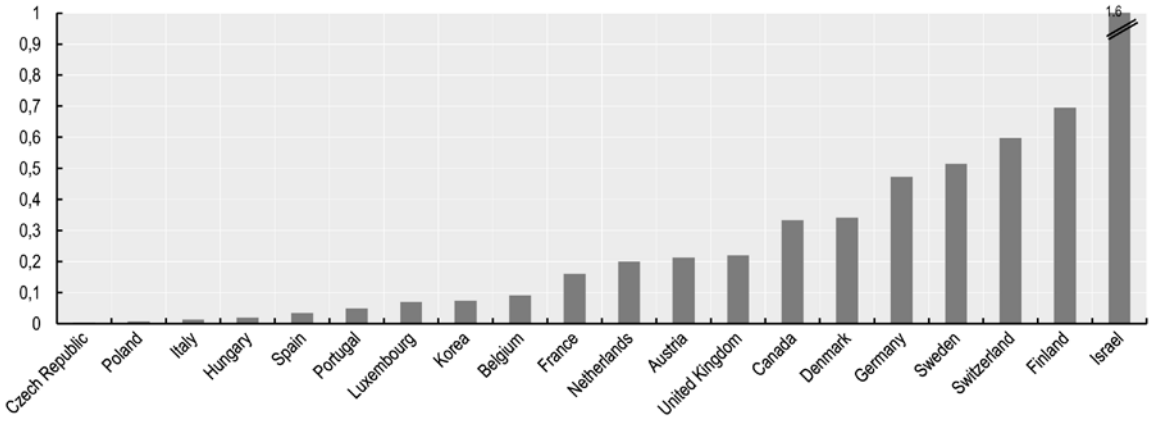

Figure 2: Venture capital backed company rate, Per 1000 enterprises, 2010
Source: Entrepreneurship at a Glance 2013 – © OECD 2013

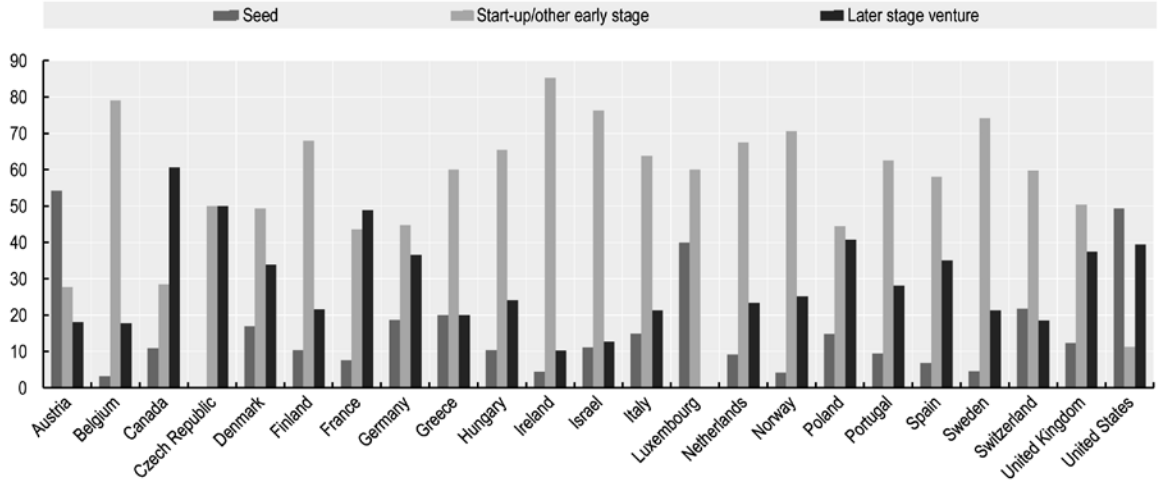

Figure 3: Venture capital backed companies by stage, Percentage, 2011
Source: Entrepreneurship at a Glance 2013 – © OECD 2013

supporting organizations, but the also the poor competitiveness and low level of innovations and still the low quality of the management, so the enterprises are not ready to be invested in (Karsai, 2013).

The venture backed enterprises were more competitive than others, and showed higher differences on the field of the individuality of the product, quality of technology and the continuity of innovation (Szerb, 2009).

So the innovative, technology-based small firms with individual product have high growth potential, and in this contest automatically become potential targets of venture capital investors.

Methodology

Our research team made a survey in four large university cities in Hungary (Budapest, Debrecen, Pécs and Szeged) in order to learn more about Hungarian academic spin-offs. According to our definition the founders of the companies were those who have developed technologies or created research results through their university work and utilized these within the spin-off companies in a state university. The researcher was a university associate in the moment of company foundation, and could remain in this position after the foundation, and did not need to have a formal connection with the company. The immaterial means had to be intellectual property based on some kind of new technology and/or a codified knowledge.

Before the research there was no available integrated database, statistics on the national spin-off companies, which made the research difficult, so we had to develop a database. To identify potential university spin-off companies we used our own personal contact systems, the university technology-transfer offices, and internet sources. During the implementation we succeeded in identifying 80 university spin-off companies, and we successfully involved half of them in the personal queries. According to our estimations, we succeeded in identifying half of the national university spin-off companies in line with our definition. 40% of the queries were located in Budapest, while 20%-20% were in the provincial cities.

During the research we implemented a questionnaire-based personal query, then we examined the composed questionnaires, beside the companies' basic information (company name, headquarters, year of foundation, sector

of activity, knowledge-intensive industry, information from annual reports), also the innovative activities and intellectual portfolio, the founder researcher as a person, his/her motivations, social capital, and the companies' connection and cooperation with the parent-institution. Moreover, information on the companies' functioning, growth, performance and financing were also subjects of detailed analysis.

The growth of university spin-off companies

60% of the companies are in the early phase of their lifecycle, 19% are in their seed phase, 16% at the start-up and 33% are in their early phase, so more than half of the companies being at their early phase got over the seed and start-up period (Figure 4). The tasks in the seed period are the company establishment, concept development, business plan making. The characteristics of the start-up phase are the testing of the prototype, product development, production and the start of the selling.

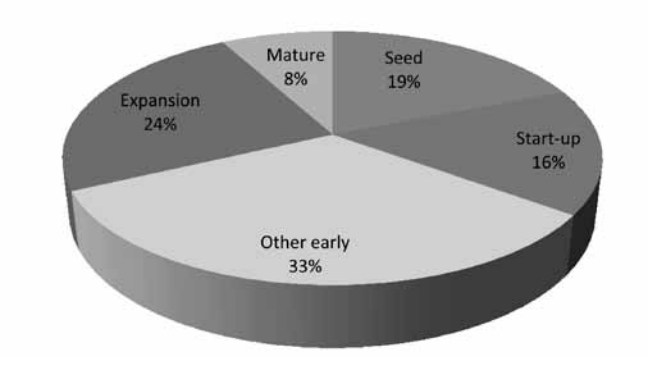

Figure 4: Distribution of Hungarian spin-off companies according to phases of lifecycle in 2012 (%)
Source: own compilation

Seven companies in the sample are in this phase, one of them was founded in 2011, the rest in 2008 or earlier, their age is 5 years in average, so the majority of them are stuck in this phase.

The companies within the sample are in the phase since 29 months in average (minimum 12 and maximum 70), which means that in this time period they did not succeed in entering the phase of early expansion. Since the average annual increase of their revenues is 8%, their entering into the next phase cannot be expected in the near future.

Considering the certain stages of life, most of the companies (33%) are in the early phase, or in the phase of early growth, that means the product development ended, the selling and the marketing are in full swing, the organization is formed (Kosztopulosz – Makra, 2005; Szerb, 2006; Becskyné, 2008). These companies of the sample were formed 3-7 years ago. They are in the early expansion phase for 27 months in average (min. 12, max.48), and the average annual increase of their revenues is 84%. This means that the companies realized the highest revenue in this phase.

After the early stages follows the expansion stage or the phase of market expansion, during which the company may go under rapid growth, one-fourth of the respondents can be classified in this phase, which had been established in the '90s. It's noteworthy that none of the companies founded in the '90s reached the mature phase. Their revenue increased in 8% in average in the past four years, so in their case we can rather talk about stagnation and not expansion. The companies in the phase of expansion, which were established after the '90s, have an increase of revenue of 39% in average, in case we do not take account in the average the one extremely high value 1038%. The average of the revenue increase in the aspect of all companies is 31,6% (when calculating the average the two extremely high values of 1038% and 332% of annual increase were not included).

By the time of reaching the mature phase, the company is usually settled down, the selling stabilized, the revenue is significant, the organization is formed, and the need for external sources is minimal or non-existent. 8% of the assessed companies reached this phase. Within the sample this equals in total three companies, which were founded in 2002, 2005 and 2008, therefore through rapid growth reached this phase in 4, 7 and 10 years through the growing phases of the lifecycle.

The annual revenue of the company established in 2008 was 3,7 million HUF, which means it did not have an expansion potential. The company established in 2005 had revenue of 76 million HUF, while the company established in 2002 had revenue of 203 million HUF, which is a more significant revenue. In the past four years this company's revenue grew 14% in average, therefore its expansion slowed down in the mature phase.

In total we can conclude that some of the spin-off companies are mostly stuck in the seed, start-up phase, or they are stagnating, and they grow slowly in the expansion period. The companies being in their early expansion phase produced the highest expansion, so further expansion can be expected from them.

The respondents rated the level of obstruction on the Likert-scale (1: not at all, 5: entirely) of the listed factors in the aspect of the growth of the assessed spin-off companies. The growth of the spin-off companies is primarily obstructed by external factors, the general economic status being the mostly responsible among them. According to the evaluation, the state also creates serious obstacles in the growth of spin-offs, through unpredictable regulations and the lack of funding opportunities.[2]. Among the inhibiting internal factors of the spin-offs' growth are the company's international acquaintance, short past, and the lack of trained and experienced professionals (e.g. in the field of international selling and marketing) are the most significant. The lack of domestic and foreign demand for the products, the significant administrational burdens and the insufficiencies in the company's system obstruct the companies' growth in over moderate extent *(Table 1).*

[2]Although funding through applications did not prove to be primary motivations for the establishment of spin-off companies, and the researchers are not operating their company for the current application possibilities, but they would like to rely on application funding beside own capital in the company's growth.

Table 1: The listed factors to what extent do obstruct the companies' growth?

Value	Possible answers
3,19	General economic status
3,06	Unpredictable state regulations
3,03	Lack of state funding opportunities
2,97	The company's international acquaintance, short past
2,73	The lack of trained and experienced professionals (e.g. in the field of international selling and marketing)
2,70	Insufficient domestic demand for products
2,70	Insufficient foreign demand for products
2,67	High administrational burdens
2,64	Insufficiencies in the company's organizational system
2,56	High tax and social security burdens
2,54	Internal leadership, management insufficiencies, problems
2,48	The lack of venture capital
2,39	Lack of good business potentials
2,33	Lack of loan sources
2,29	University bureaucracy, lack of supportive environment
2,00	Lack of adequate business partners and suppliers
1,97	Insufficiency of business, administrative services (e.g. legal, consultancy, commercial)
1,91	Lack of own equity
1,89	Unfair competition
1,67	Lack of technology transfer services
1,53	Low international competitiveness of products
1,08	Low quality of the used technology

Source: own compilation

The low quality of the used technology and the low international competitiveness of products almost do not at all obstruct the growth of spin-off companies, therefore the used technologies and the products are competitive on international level. The lack of own equity does not represent an obstructing factor in the aspect of financing, the lack of loan sources and venture capital moderately obstructs, but for the assessed companies the lack of state funding opportunities represents a significant burden. This is rather remarkable having in mind that 62% of the assessed companies received funding from state/community sources, but only 11% got venture capitals and only 9% received angel investor financing. This draws the conclusion that the assessed companies would primarily seek financing opportunities from the expansion of non-market "soft" state sources and in comparison their will or possibility for the integration venture capital is lower.

The financing of Hungarian university spin-off companies

Table 2 shows the percentage of the companies within the sample reporting to have been received financial support in the given phase of growth. Since the current phase of lifecycle is different among the companies, hence the company being in an early phase could not have chosen an answer of e.g. financial support for expansion, but the data in the columns can be compared with each other. Two-thirds of the companies used their own savings in the seed period, while one-third received non-refundable financial support from the state. The companies that financed their activities through involving a foreign capital or an angel investor or a close family member, also reached the high percentage of 22,2%.

In the start-up phase the non-refundable financial sources got the most scores as financing sources (41,7%), the own savings got the second place (36,1%). The sequence is very similar among other companies being *in other early stages or early expansion*, where the respondents ranked 33,3% and 19,4% the above mentioned sources. In the phase of *expansion* most of them selected the non-refundable sources, but the own savings were preceded by close family members and financing through customers. By the way, financing through customers in all phases indicated 16,7%.

Table 2: Financing sources of the Hungarian spin-off companies in the various phases of their lifecycle (proportion of those indicating the given answer compared to the total number of respondents, %)

Financial sources	Seed	Start-up	Other early	Expansion
Stranger individual/ external capital/angel investor	22,2	13,9	2,8	2,8
Distant family members, friends	2,8	0	2,8	2,8
Close family members	22,2	11,1	5,6	16,7
Own savings	66,7	36,1	19,4	8,3
Other non-financial company	5,6	2,8	2,8	0
Venture capital company	5,6	13,9	8,3	0
Refundable state (EU) support	8,3	5,6	2,8	0
Parent company	5,6	11,1	8,3	2,8
Non-refundable support	33,3	41,7	33,3	19,4
Short term bank loan	2,8	2,8	13,9	2,8
Long term bank loan	5,6	11,1	8,3	8,3
University	11,1	8,3	8,3	2,8
Supplier	2,8	2,8	2,8	2,8
Customer	16,7	16,7	16,7	16,7

Source: own compilation

Remark: more answers were acceptable

In the start-up period the venture capital financing received the highest proportion, followed by the period of early growth and seed, but in the expansion period none of the companies received venture capital. Financing through distant family members, friends, other non-financial companies and suppliers were selected in little number, and an even smaller proportion chose the refundable state support (e.g. preferential loans), parent companies as well as short term and long term bank

loans. The short term bank loans were selected in the early growing stages, while the long term bank loans in the start-up phases in 13,9% and 11,1%. The significance of university sources is similarly low; it only got over 10% in the seed phase. Overall, the Hungarian spin-off companies within the sample primarily rely on own resources and non-refundable state funds in financing their activities, and the 3F-s' role is also significant (family, friends, fools – i.e. strangers) in the seed and start-up phases.

The institutional venture capital does not mean general funding source for them, despite the fact that technology-oriented companies, in the same time spin-off companies with big expansion potential are more likely to receive venture capital than other companies.

The institutional venture capital financing of the Hungarian spin-off companies

The respondents indicated their experiences connected to venture capital financing in all different cases on a five-point Likert scale (Table 3). Considering the average of the answers the highest value was reached by the variable indicating that the venture capital investors do not know enough about the given technology. The international competitiveness of the applied technologies do not mean problems in the aspect of the growing of the companies as mentioned previously, but in the aspect of finding investors. The new nature of the technology may cause an information gap, therefore the venture capital investors do not know the applied technology, but if – not only in the owners' opinion of realistically – the technology or the product is internationally competitive, there would probably be will from the venture capital investors' side to finance the company. The availability of venture capital for the spin-off companies could be resolved through dissolution of the informational asymmetry.

The venture capital investors do not like to invest small amounts, which is the second significant problem and a problem also confirmed in the international literature, is the venture capital investors moved in the direction of financing companies in later phases of growth or companies with bigger capital needs and mainly to out buying due to economics of scale reasons. According to Pinch and Sunley (2009) although the UK venture capital industry is the most developed in Europe, the early-stage financing is much smaller and less active than in the US. The capital gap and informational asymmetry together result a financing gap in the early stage (Becskyné, 2008; Freear et al., 2002; Freear et al., 1994; Freear and Sohl 2001). The financing gap could be overbridged through angel investors and through angel investors' networks, and venture capital networks. Investments and knowledge exchanges are often made across considerable distances, (Pinch and Sunley, 2009). The supply of venture capital of the spin-off companies is also trammeled by the high yield expectations of the investors, which is an internationally known characteristic of the supply side similarly to the previously mentioned, since usually the industry is characterized by great growth potential, aiming at international markets, promising high yield of investment when exiting (Karsai, 1997). On the demand side, namely from the companies' view the most important problems arising are the fear of freedom of decision restraint, but on the other hand they do not have adequate entrepreneurial and management skills. These are general problems in other countries, too, but as long as the change in approach does not happen, the spin-off companies cannot expect to receive higher venture capital financing than before.

Table 3: The experiences of the Hungarian university spin-off companies in the field of venture capital financing

Value	Opinion
4,0	The venture capital investors do not know enough about the given technology
3,7	The venture capital investors do not like to invest small amounts
3,6	The venture capital investors have high yield expectations
3,5	The involvement of venture capital investors restricts the company leader(s)' freedom of decision during the functioning of the company
3,2	The venture capital investors averse to financing seed, start-up or early stage companies
2,9	The investment is hampered by the low quality business plan
2,8	The investment is hampered by the lack of entrepreneurial, management skills
2,7	The economic policy does not support enough venture capital investments
2,6	There is not enough information about the venture capital investors
2,6	The exit opportunities for the venture capital investors are bad

Source: own compilation

Conclusions

For the entrepreneurs the most important requirements of starting a business are the appropriate business idea and the necessary financial resources. The Hungarian entrepreneurs are mostly motivated by personal independence, freedom and better income prospects and not innovation. In occasion of venture capital investments the entrepreneur has to give up part of the independence and needs to cooperate with the investor to generate high-growth and international business success. According to the survey the founders of spin-offs find that the involvement of venture capital investors restricts their freedom in decision making and it can remain an important obstacle for venture capital financing. The creation and growth of university spin-offs can be stimulated by lowering information asymmetry and facilitating contact and trust between venture capitalists and entrepreneurs, especially in cases where the lack of managerial skills of entrepreneurs occurs. The founders generally they do not have enough managerial skills and they are not able to write high quality business plan.

In Hungary the number of internationally competitive spin-offs, ready and willing to involve venture capital, is much lower than in the US or Western European countries.

The founders find that the venture capitalists have too high expectation, and however the founders would need the capital, managerial skills and network provided by venture capitalist, they are not willing to give up their freedom. The Hungarian founders of spin-offs should learn more about the form of venture capital financing and the venture capitalist should have more information about the technologies of spin-offs in order to reduce the information gap between the demand and supply side of venture capital. At the same time the financial environment of Hungarian firms should be strengthened by the government in order the venture capital contracts to be concluded satisfying either the venture capitalists or the entrepreneurs of Hungarian spin-offs. Until Hungarian spin-offs are able to involve soft money from state sources the improvement of venture capital demand cannot be expected.

Hungary could take advantage of benefits in some special fields if innovation, as the country has the best rates in some indicators of innovation. The efficiency of information flow between the venture capitalists and entrepreneurs would lead to more transactions and more Hungarian spin-off would reach international successes. The latest years' policy and special programs like JEREMIE generated more transactions, that helped to inform the entrepreneurs about venture capital and helped to co-invest public resources with private equity more efficiently, but the global crisis had negative impact on the industry.

The spin-offs are more likely to involve venture capital, than their counterparts, so generally they can create relatively higher economic growth, but because of the low number of occurring and potential venture capital backed spin-offs, they cannot have a high impact on total economic growth.

References

Bácsné Bába É. (2011): Változás-vezetéshez kapcsolódó idővizsgálatok. Virtuális Intézet Közép-Európa kutatására Közleményei, Vezetéstudományi tematikus szám III. (1-2 (No. 5-6)) Szeged, 2011. pp. 271-276

Becskyné Nagy, P. (2008): *A kockázati tőke hozzáadott és „elvett" értéke.* Doktori értekezés, Debreceni Egyetem Közgazdaságtudományi Doktori Iskola, Debrecen, pp. 255

Cornell University, INSEAD, and WIPO (2013): *The Global Innovation Index 2013: The Local Dynamics of Innovation,* Geneva, Ithaca, and Fontainebleau. ISSN 2263 3693 ISBN 978-2-9522210-3-0, pp. 417

European Investment Fund (2013): *European Small Business Outlook June 2013.* Working paper 2013/18.

Fenyves, V., Tarnóczi, T.: (2011): A kockázatkezelésről controllereknek (2). A controller: A gyakorló controllerek szakmai tájékoztatója VII.:(1) pp. 8-12.

Herczeg A.: Analyse the Financing Structure of Agricultural Enterprises in 2002-2006. Applied Studies in Agribusiness and Commerce Vol.3. Number 5-6.2009. AgroInform Publishing House 91-94.p. HU-ISSN 1789-221X

Karsai, J. (2013): *Venture Capital and Private Equity Industry in Hungary.* Acta Oeconomica, Vol. 63, No. 1, pp. 23-42

Karsai, J. (1997): *A kockázati tőke lehetőségei a kis- és középvállalkozások finanszírozásában*. Közgazdasági Szemle, XLIV. évf., pp. 165-174

Karsai, J. (2011): *A kockázati tőke két évtizedes fejlődése Magyarországon*. (Two decades of venture capital development in Hungary.) Közgazdasági Szemle, LVIII. évf., 2011. október, pp. 832-857

Karsai, J. (2013): *Válság után: változó állami szerep a kockázatitőke-ágazatban.* (After crisis: changing role of state in venture capital industry.) Külgazdaság, 2013/5-6. sz., pp. 12-34.

Karsai, J. (2013): *Venture Capital and Private Equity Industry in Hungary*. Acta Oeconomica, Vol. 63 (1) pp. 23-42

Lengyel, B. (2012): *Nemzetközi tapasztalatok az akadémiai spin-off folyamat kormányzati támogatásában.* (International experience in public supporting university spin-off process.) In.: Makra, Zs. (2012): Spin-off cégek, vállalkozók és technológia transzfer a legjelentősebb hazai egyetemeken. Universitas Szeged Kiadó, Szeged, 2012. pp. 87-116

Macmillan, I.C. – R. Siegel – P. N. Subbanarasimha (1985): *Criteria used by venture capitalists to evaluate new venture proposals.* Journal of Business Venturing 1: 119–28.

Monitor Group: *Path to Prosperity Promoting Entrepreneurship in the 21st Century.*

Muzyka, C. – S. Birley – B. Leleux (1996): *Trade-offs in the investment decisions of European venture capitalists.* Journal of Business Venturing 11: 273–87.

OECD (2013): *Entrepreneurship at a Glance 2013*.

Orbán I. (2003): *A jövedelmezőség elemzése a döntésmegalapozás fényében.* Agrárgazdaság, vidékfejlesztés és agrárinformatika az évezred küszöbén (AVA). Nemzetközi konferencia. Debrecen. 264. + CD

Ortin-Angel, P. – Vendrell-Herrero, F. (2009): *Why do university spin-offs attract more venture capitalists?* Venture capital, Vol. 12, No. 4, October 2010, pp. 285–306

Prowse, S. (1998): *The economics of the private equity market.* Federal Reserve Bank of Dallas Economic Review, Third Quarter, pp. 21–34.

Pinch, S – Sunley, P. (2009): *Understanding the role of venture capitalists in knowledge dissemination in high-technology agglomerations: a case study of the University of Southampton spin-off cluster.* Venture Capital, Vol. 11, No. 4, October 2009, pp. 311–333

Siegel, D. – D. Waldman – A. Link (2003): *Assessing the impact of organizational practices on the relative productivity of university technology transfer offices: An exploratory study.* Research Policy 32: pp. 27–48.

Shane, S. (2004): *Academic entrepreneurship: University spin-o s and wealth creation.* Cheltenham: Edward Elgar.

Shepherd, D. A. – R. Ettenson – A. Crouch (2000): *New venture strategy and profitability: A venture capitalist's assessment.* Journal of Business Venturing 15: 449–67.

Szerb, L. (2009): *A magyarországi kis- és közepes méretű vállalatok kockázatitőke-finanszírozási lehetőségei.*(The opportunities of Hungarian SME's in venture capital investments.) In: Ulbert, J. (ed.): Az iskolateremtő. Pécsi Tudományegyetem, Közgazdaságtudományi Kar, pp. 247–258

Zhang, J. (2008): *The performance of university spin-offs: an exploratory analysis using venture capital data.* J Technology Transf (2009) Springer Science + Business media, 34: 255–258

Vohora, A. –M. Wright – A. Lockett (2004): *Critical junctures in the growth in university high-tech spinout companies.* Research Policy 33: 147–75.

Wright, M. – A. Lockett – B. Clarysse – M. Binks (2006): *University spin-out companies and venture capital.* Research Policy 35: 481–501.

Wright, M. – A. Vohora – A. Lockett (2004): *The formation of high-tech university spinout companies: The role of joint ventures and venture capital investors.* Journal of Technology Transfer 29: 287–310.