
Learning from Best Practices of Business Incubation of High-Tech Start-Ups

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Abstract: Start-ups' survival and growth rates are the core indicators of successful business incubation. However, in spite of similar incubation models, results of incubation may be different in different countries, depending on institutional factors and market turbulence intensity.

This paper studies differences and similarities of high-tech start-ups' incubation in Finland, Hungary and Russia – countries with different institutional setting and market turbulence. We aim to study: 1) external factors pushing firms to enter incubator; 2) difficulties companies struggle to survive and to grow; and 3) to find out if these problems can be overcome by successful incubation and leveraged by range of incubator's services for start-ups. Semi-structured interviews were conducted in 9 companies. Results explains role of business incubators in boosting the innovativeness, entrepreneurship and creating favourable growth conditions for start-ups in different institutional settings.

Keywords: technology entrepreneurship, start-ups, business incubators, NIS, science parks, turbulence

1 Introduction

Fostering new business and technology ideas, turning them into successfully commercialized and internationally competitive innovative products is the objective of innovation policies in many European and neighbours' countries. However, statistics reports high failure and low growth rate of most of start-up companies (especially, technology intensive). Business incubation is effective method to promote entrepreneurial innovation capabilities and to provide support for high-tech start-ups (Löfsten & Lindelöf 2001). Business incubators have been successfully implemented in USA, Finland, Sweden, Israel and other countries (Roos et als, 2005; Voisey et als, 2004, Aerts et als, 2004). The outcomes of the incubation are assessed by the high-tech start-ups survival and growth, sustainability, and community-related impact. However, not enough empirical evidences were found to proof significant difference between the growth and death of high-tech start-ups located in business incubators and outside (Storey and Westhead, 1994).

The success of incubation of technology start-ups is moderated by the country specific institutional factors (government policy, investment decision), national innovation system (NIS) (Freeman, 1982, 1987; Lundval, 1992; Nelson, 1993) and market turbulence (Somaya and Teece, 2007; Bröring, 2010). However, there is lack of cross-country studies on start-ups incubation in Europe and in the neighbourhood.

We specify our research gap as analysis of incubation processes in countries with different institutional settings and market turbulence and instability: Finland, Hungary and Russia. The innovation policies in all these countries aim for increasing innovation output by fostering innovation entrepreneurship and establishing technology oriented and innovative companies.

According to Global Competitiveness report 2012-2013 (WEF, 2013), which assesses the competitiveness of 144 economies based on drivers of their productivity, Finland is innovation-driven economy and is ranked third in overall rating and second innovation, but seventh in business sophistication. Hungary and Russia are both in the transition stage from efficiency-driven to innovation-driven economy. The Hungary's place in overall rating is 60th (Russia – 67th), 37th in innovation (Russia – 85th) and 86th in business sophistication (Russia – 119th). Analysed countries have different positions in terms of institutions (Finland – 3, Hungary – 80, Russia - 133), infrastructure (Finland – 23, Hungary – 50, Russia - 47), and macroeconomic factors (Finland – 24, Hungary – 44, Russia - 22).

In this paper, we aim 1) to analyse instructional and NIS factors influencing the firms' decision to become a resident of incubator and their growth; 2) to analyse the problems company face to achieve the stable growth rate; 3) to find out if these problems can be overcome by successful incubation and using provided services.

In order to answer these research questions, we conducted semi-structured interviews of 9 start-ups (3 from each country) located in incubators, or recently graduated from incubators.

The paper is structured as follow: first, in chapter 2, we analyse literature and business incubators as part of NIS of Finland, Hungary and Russia. In chapter 3 we discuss the research design, data collection process and describe the case companies. Then we analyse and present results and in the conclusions we underline our main findings and provide policy recommendations.

2 Incubation of Start-Ups in Literature and in Practice

2.1. Business Incubation

Science parks and business incubators are organizations aiming to promote innovation culture and competitiveness of companies and related knowledge-based institutions, and to enhance knowledge exchange between R&D organizations, companies and universities (IASP, 2002). Business incubators are also seen as intermediary organizations between public research organizations and business, enhancing technology commercialization (EU Commission, 2007).

With the popularity of the business incubation concept starting in the early 1980's, numerous studies have been conducted to assess the emerging incubator industry (Mian, 1996). Most of these studies are primarily descriptive, generally covering various types of incubation models. The existent literature on business incubators covers mainly the developed countries such as USA, Japan, Finland, Sweden (Roos et als, 2005; Voisey et als, 2004, Aerts et als, 2004). The studies of the incubaitons processes in the countries

with higher turbulence remain limited. As we mentioned earlier, the success of incubation of technology start-ups is moderated by the country specific institutional factors, NIS (Freeman, 1982, 1987; Lundval, 1992; Nelson, 1993) and market turbulence (Somaya and Teece, 2007; Bröring, 2010). Therefore, unfavourable environmental conditions may influence entrepreneurial decisions (Misra et al., 2012). Thus, following our research objectives, we formulate our first research proposition as follow:

Research Proposition 1: The implementation, operation and performance of business incubators in different countries present great diversity and heterogeneity.

Business incubators for start-ups are established in order to achieve synergetic effects, improve regional development and motivate reindustrialization (Castells and Hall, 1994). The creation of incubators is often positioned as the governmental support for the start-ups and SMEs on the early stages of their development, when they need physical space, mentoring, networking, etc. (Garnsey, 1998). Government entrepreneurship programs may enhance opportunity recognition, and facilitate creation of new ventures (Shane, 2003). The second research proposition is formulated as follow:

Research Proposition 2: When entering incubator, start-ups firms have rather high expectation on governmental support on early stage of development

The main role of an incubator is, therefore, to assist entrepreneurs with business start-up and development, and with possible involvement, of the public, private and non – profit sectors (OECD, 1999). Incubators, private or public, provide resources enhancing the creation of new small firms and also support, directly or indirectly, the corporate spin-offs (Löfsten & Lindelöf, 2001). Location in business incubators is often associated with reduce risks and lower costs. This leads to enhancing growth, success and promoting technology development of high-tech start-ups (Cui et al, 2010). The third research proposition is formulated as follow:

Research Proposition 3: On early stage of development, residents of business incubators, have rather high expectation on support on operations, dealing with complication, and securing companies' growth.

To accomplish firms' survival and growth objectives, a typical business incubator program provides the services like: shared offices and working space, affordable rent and fostering networking and cooperation of firms inside the incubator and in the local economy (Mian, 1996). Business incubation's services improve employment, local economic growth and FDIs (Markley & McNamara, 1995). However, it is not enough to provide good infrastructure and physical services, there is a need for systematic business and management assistance for start-ups (Erikson and Gjellan, 2003).

The services provided by business incubators (BI) are classified as follow: infrastructure, business support, and access to networks (Bruneel et al., 2012).

1. *Infrastructure.* BIs provide turnkey office space, offering small workshops and premises for prototyping or small scale production. Support services like reception, secretarial services, parking and meeting rooms exist in every BI.
2. *Business support.* BIs provide coaching and trainings to their tenants. Some BI have in-house coaches, some provide tenants with outside coaches. While some frequently organize training sessions covering a range of small business and entrepreneurship topics, others provide further training passively or grant access to workshops of some of their stakeholders.

3. *Access to networks.* Professional business services are provided by all generations of BIs. Access to these services may be provided passively by co-locating with these services, including university technology transfer offices, consulting firms, insurance companies and project management firms within the BI's premises (Bruneel et al., 2012).

Research Proposition 4: The perception and value of services, provided by business incubators are different for start-ups in different countries.

2.2. NIS and Institutional factors

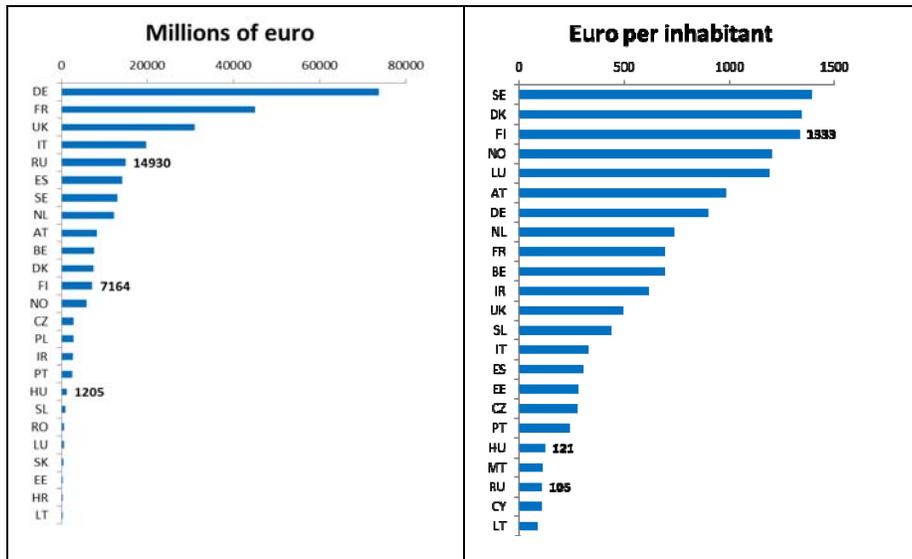
The success of incubation of technology start-ups is moderated by the country specific institutional factors, national innovation system (NIS) (Freeman, 1982, 1987; Lundval, 1992; Nelson, 1993) and market turbulence (Somaya and Teece, 2007; Bröring, 2010). Some of these factors are related to PEST analysis (general country political environment, policy regulations (firm registration, taxes), economic situation, cultural and social norms, technology development, education level, R&D transfer (access to new technology), commercial and legal infrastructure); company support factors (access to finances: bank credits, venture capital; government entrepreneurship support programs); Market related factors: market dynamism, market openness, market turbulence. Other factors are associated with NIS. Thus, The Triple Helix frameworks the process where academia, government, and industry collaborate to create or discover new knowledge, technology, or products and services that are transmitted to final (Tetřevová, 2010).

External factors, associated with NIS and institutional and infrastructural factors, have effect on incubation process. In our study, we consider next factors (Bosma et al., 2012): Finance; National Policy-General Policy; National Policy-Regulation; Government Entrepreneurship Programs; Entrepreneurial Education-Primary and Secondary level; Entrepreneurial Education-Post School; R&D Transfer; Commercial and Legal Infrastructure; Internal Market-Dynamics; Internal Market-Openness; Physical Infrastructure; Cultural and Social Norms. We analyse the role of external factors and claim in our next RP that:

Research Proposition 5: Institutional and NIS external factors influence companies decision to enter business incubator. Moreover, role of these factors is country-specific.

2.3. NIS in Finland, Hungary and Russia

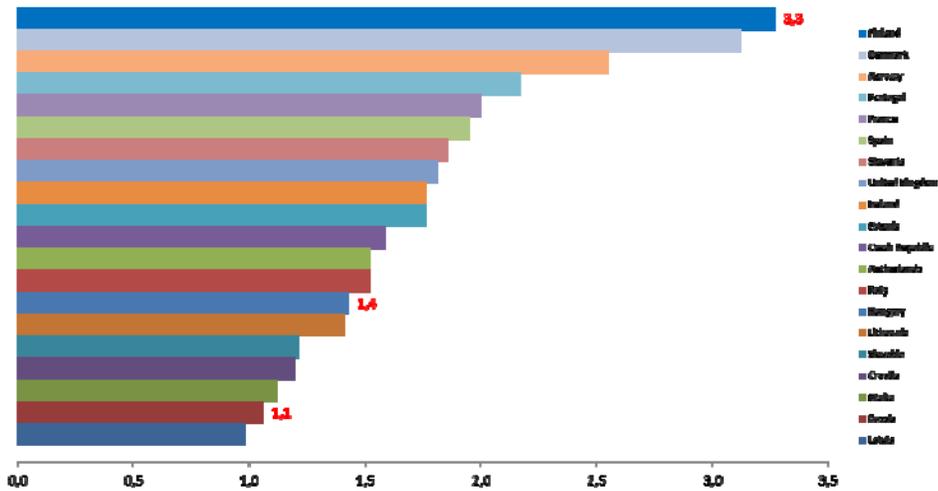
The rating presented in Global Competitiveness report 2012-2013 (WEF, 2013) classify Finland as innovation-driven economy, and Hungary and Russia in the transition stage toward innovation-driven. European Innovation Scoreboard (2013) marks Finland as "Innovation leader" together with Denmark, Germany and Sweden. The performance of Hungary (alike Czech Republic, Greece, Italy, Lithuania, Malta, Portugal, Slovakia and Spain) is below EU27 average – these countries are "Moderate Innovators". Russia has spent 14930 million euros on R&D, what is twice as much as Finland, and more than 10 times more than Hungary (Figure 1). However, R&D spending per capita proves the position of Finland as innovation leader (after Sweden and Denmark) – 1333 euro per capita. Hungary and Russia have R&D spending 121 euro and 105 euro per capita respectively.



Source: Eurostat

Figure 1 Total intramural R&D expenditure, TOP 25 countries

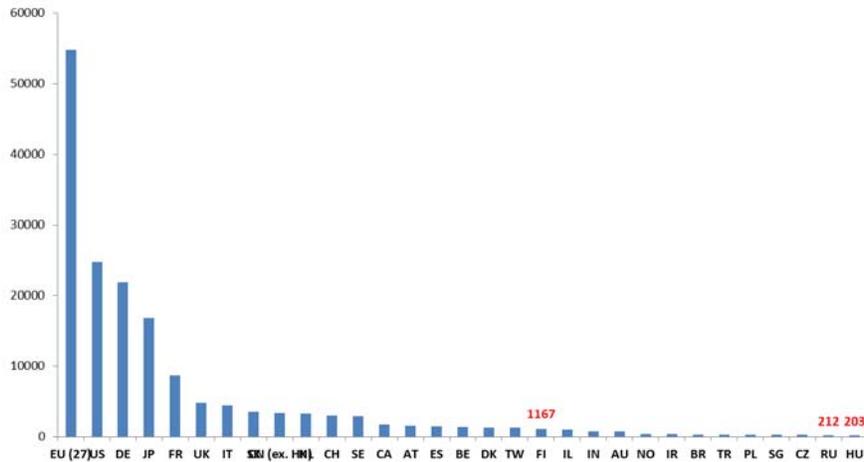
Another indicator characterising NIS is the number of people employed in R&D and research. The share of R&D personnel and researchers in total employed population in Finland is 3,3 % is the highest in Europe (Figure 2). Hungary and Russia has 1,4 % and 1,1 % prospectively. Hence, Russia is often referred as country with high R&D potential, educated personnel and high number of R&D workers, but on the European scale, the result is second last.



Source: Eurostat

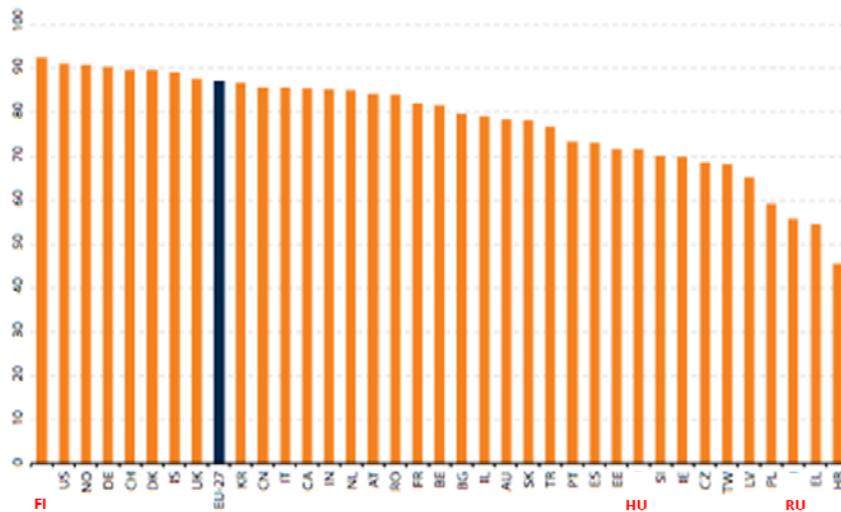
Figure 2 Total R&D personnel and researchers as % of total employment, 2010

The significant innovation performance in Europe is generated by innovative companies. The share of innovative enterprises in Finland is 56% (Eurostat, 2011), in Hungary is 31% and in Russia only 10%. The innovation output on the national level is measured in number of patent applications (Figure 3) and share of patents submitted by business sector (Figure 4). Finland submits more than 5 times more patents than Hungary and Russia, 90% of them applied by business. Hungarian companies apply over 70% of national patents, while Russian companies only slightly over 50%.



Source: Eurostat

Figure 3 Patent applications at the national level, 2010



Source: Science, technology and innovation in Europe, 2012

Figure 4 Patent applications submitted by business enterprise sector, 2010, %

In the following chart (Table 1) – comparing data from Hungary, Finland, Israel, Russia - we analyse some data what shows quite well how the R&D inputs are utilized.

Table 1 Comparison of NIS Indicators

Data	Hungary	Finland	Israel	Russia
Population (million)	10	5,2	7,5	142,5
Triadic patent families (2010)	44	353	335	73
Number of the international patents (per million people) (2010)	4,4	67,8	44,7	0,51
Venture capital funds (VC) specialized on the early phase (2009)	5-6 (2013)	10	60	100
Companies on 2012 Deloitte Technology Fast 500 EMEA Winners	5	27	28	3

Source: *Victa, 2007, OECD, 2013, Deloitte Technology Fast 500 EMEA Winners, 2012*

2.3. Business Incubation in Finland, Hungary and in Russia

Development business incubation in Europe is advised and regulated by Research and Innovation Policy Guidelines 2011-15, which includes the program for the support institutions, discussing the development of regional business incubation and technopark guidelines (OECD 2012). The outcomes of the incubation are assessed by the high-tech start-ups survival and growth, program growth and sustainability, and community-related impact.

2.3.1. Finland

On governmental level, Ministry of Employment and the Economy introduced INKA (2014-2020) programme aiming at enhancing creation of new high tech businesses, improve the competitiveness of companies and to speed up the establishment of innovation centres (TEM 2012).

Finland has business incubators in nearly every town. According to the Finnish Science Park Association (TEKEL), there are 29 science parks and technology centres as members in its nationwide co-operation network (Tekel 2013). The largest private business incubator Technopoli has 16 campuses in Finland, hosting mainly technology and service companies, but aiming to increase the share of healthcare and educational sectors (Technopolis, 2013). Major sources of financial support in Finland are ELY-Centres, Tekes, Finnvera and the Foundation for Finnish Inventions. Tekes alone finances about 1500 business research and development projects annually and 50-60% of the total financing is directed at small businesses (Tekes, 2011).

The Finnish incubator system based on sponsoring projects, the key characters are the project managers and not the experienced business professionals like in the Israeli model. There is a significant difference regarding the number of the enterprises served by the system, in the Finnish system 10-15 enterprises has an incubator manager which is 3-4 times more than in Israel. In Finland the low level of the capital investment after the incubation refers to the big number of lifestyle entrepreneurs in the incubators. The other problem is the exaggerated importance of properties in the Finnish incubators. The incubation services are often provided as a part of the property management, but in Israel the property management is only one part of the incubator system and definitely not the most significant part.

Support for high-tech start-ups and entrepreneurs (assisting in developing business idea, search for partners, trainings, start-up money) is provided by 120 Employment and Economic Development regional Offices (TE-palvelut, 2010). 83 Service centres for entrepreneurs across the country, and Enterprise Finland also consult start-ups (Enterprise

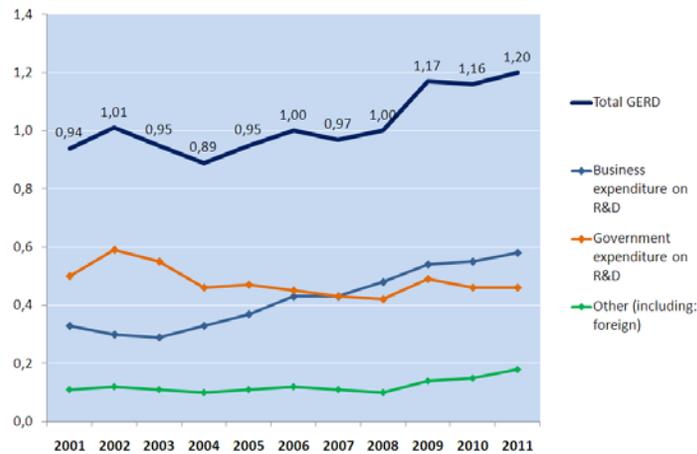
Finland, 2013). Additionally, there are non-profit organizations for start-ups and aspiring entrepreneurs such as “Start-up Sauna”, offering accelerator program for early-stage startups (Start-up Sauna, 2013).

Finland decided to launch the “Incubator 2.0 program” based on the Israeli model. According to the program the incubators should be owned by a Finnish-international joint venture capital fund and make the research universities and researchers interested with lower ownership shares. Thank for the Finnish decision makers fast reaction six technology incubators was launched in 2009 which operate according to this model. They named them as Vigo accelerator because the name incubator had been discredited. The author of the VICTA study highlighted a few problems: The bureaucracy and the public procurement system make the flexible investment processes more difficult. The state gets ownership in the incubated enterprise in return of its investment and the top of that it exercises its rights in a bureaucratic way via its men delegated into the enterprises’ management.

Science parks in Finland, such as Technopolis, provide space and services for companies of all sizes, support to grow for start-ups and growth companies, and finance consulting for mature companies (Technopolis 2013). Additionally, science parks offer networking services, contacts, and project co-operation. Science parks have an important role in the Finnish innovation system since they provide assistance in the creation, growth and internationalisation of growth companies and technology-oriented business (Tekel 2013).

2.3.2. Hungary

2011 the GERD / GDP ratio went up to 1.2 per cent – which is the highest figure in the past two decades – it is still well below the 1.9 per cent average of the European Union. Hungary will be successful if and only if the government, companies, researchers and other stakeholders consider R&D and innovation as an investment in our future, with long-term economic and social impacts and returns.



Source: National Statistical Office of Hungary

Figure 5 Gross Domestic Expenditure on R&D as a per cent of GDP

In an international context the GDP proportional R&D input of Hungary is very low. Presently in Hungary:

1. Really difficult to find high –tech start-ups, based on R&D.

2. The number of the successful companies at the world market can be called minimal in an international comparison as well.
3. The number of the patent registrations is not just very low but decreasing.
4. The business incubation is almost minimal, especially in support of the R&D based high-tech start-ups

The innovative, R&D based Hungarian firms not just do not appear at the Nasdaq, but rarely on the Budapest Stock Exchange too. Without the well-known Hungarian pharmaceutical companies there are just 3 or 4 listed firms at the BSE that fit to this category, however they can't report remarkable success either. In the last 20 years there were just some R&D based Hungarian companies that could appear on one of the foreign stock markets and/or generate significant foreign investment or buyout.

In 2012 the Minister for National Economy convened a 28 member Innovation Advisory Board, with the objective of assisting with the development of a long-term national R&D and innovation (RDI) strategy for the 2014-2020 period. The vision for the RDI strategy states the following: With the active support of Hungarian RDI policy, the key players of the National Innovation System strengthen and become invaluable partners in global innovation systems. By capitalising on spillover effects, they boost dynamism in the whole of the national innovation system. Thereby, they make a substantial contribution to the competitiveness of the Hungarian economy, making it a sustainable knowledge economy.

The overall indicator, which demonstrates progress is the GERD/GDP ratio: by 2020 the expenditures on R&D shall surpass 1.8 per cent of the value added and by 2030 it shall be close to 3 per cent.

Additionally, in 2020 in Hungary:

- +30 larger R&D labs are in the world elite,
- +30 global MNC centres of R&D are deployed,
- +30 R&D intensive „macro-regional„ medium-sized firms produce value added,
- +300 RDI and growth oriented SMEs compete on global markets,
- +1000 innovative SMEs have received substantial support, (NIS of Hungary, 2012)

In Hungary recently the Technological Start-ups have picked up and there is a kind of boom in the range of Start-up competitions. Contrarily, in case of Technological Start-ups, the classical form of incubation activity has almost disappeared. Primarily, the incubators operate like a real estate company. One of the incubators sums up its activity in the following reticent description: *“Letting offices, workshops, conference rooms. Business consultancy.”* (<http://www.123profit.hu>)

Several times, the funds of the tender helped to the inception of the office-block, occasionally like an end in itself. Often disappear the original purpose after a shorter or longer time from the strategic conceptions of the constructed or reconstructed incubators, -which were financed by different funds. The next news is an expressive example: *“...the Incubator house was realized from application and grant money, it has received the occupancy permit in the May of 2005. The building cannot alienate in the next five years of the end of the project according to the subsidy contract, but this maintenance obligation has expired by this time. The operation of the building: for example heating and cooling, cleaning costs, is a disproportionately too high liability for the management of the Holding, moreover, there is no reason to maintain this big-size headquarters with this number of employees, whose are working in the building right now.”* The operator of the building has proposed to sell the building. (<http://www.sopronholding.hu/>)

There are other solutions, which are almost similar to the incubation activity. The next example is from a web advertisement of an incubator: *“We use the evolved market rents...From this we give preferences depend on the foundation of the companies like*

this: within one year 25%, between 1 and 2 years 20%, between 2-3 years 15%, between 3-4 years 10%. ...In consideration of the spent years in the Incubator house, it is charged in addition to the base rental fee. Between 5-6 years 10%, between 6-7 years 20%, between 7-8 years 30%” (<http://www.nyirinku.hu/>)

But of course there are some (unfortunately not too much) good example for incubation in Hungary, like Kitchen Budapest: “*Kitchen Budapest is a lab that helps ideas get off the ground through incubation, education and play.*” (<http://www.kitchenbudapest.hu/>) – and it’s really working.

2.3.3. Russia

First business incubators (BI) in form of Innovation and Technology Centers (ITCs) exist in Russia since 1996 in close cooperation with Universities. These first incubators focused mainly on technology development, not commercialisation (European Commission, 2007). This has been criticized heavily, because BI has to help firms to achieve growth domestically and internationally, and commercialize products and services, not only act as provider of premises (Timokhina, 2010). Currently, there are more than 100 BIs in Russia, 58% state-owned, 32% - municipal and mixed ownership, and only 9% are private (Ernst&Young, 2010). The residents of BIs are mainly manufacturing companies - 74%, 46% of incubates have R&D focus and almost 60% operate in software and internet industries.

Government aims to the knowledge economy and puts effort to the development of the intermediaries in NIS such as BIs. The government program on the development of technoparks was launched in 2006 called “Creation of high-technology technoparks in Russian Federation”, which aimed to accelerate and support the development of the high-tech industries in Russia (Minkomsvyaz’ Rossii 2013). So far the programme has incubated 650 companies, both foreign and domestic, whose turnover in 2012 exceeded 25 billion rubles. The ministry accounted around 15 000 jobs created to the programme.

2.4. Success of Incubation: Israeli Model

Israel is one of the world’s leading technology and innovation centre. The key factor of the Israeli R&D&I system is the network of the technological incubators, which is one of the main releaser of successful start-up companies. The bottom line of the Israeli model is the optimal harmonisation of state and private stakeholders. The ratio of private to state incubators varies widely from country to country. In Israel private investors finance most incubators and profit from owning shares in successful startups. The state’s involvement in financing such companies is still crucial in the early stages (before significant venture capital is obtained).

R&D projects are too risky for private investors, most of the first investments are provided by the state in the form of grant payments, and at the same time the mostly private-owned technological incubator, for the share received in the incubated company and, in a smaller proportion, for the capital invested, not only supervises the activity of the winner start-up but it also makes efforts for the success of the enterprise. This system reached huge successes on applying R&D in businesses in the last 20 years.

In China, most of incubators are established and managed by the government, using state funds. Rent accounts for only a small portion of an incubator’s revenues and is insufficient even to cover operating costs. When these two systems are compared in terms of effectiveness, the results tend to be strongly in favor of the Israeli model.

Nowadays,

- 50% of the Israeli export comes from the research based high-tech industry

- The Israeli venture capital market is the third largest in the world (first by relative index numbers). The Israeli high-tech industry attracted more venture capital developments than the whole EU in the year 2000
- There are over 60 early phased venture capital funds operates in Israel
- The Israeli high tech industry attracts 1.5-2 bn\$ annual investments a year (it stayed over 1 bn\$ throughout the global crisis in 2009)
- Over 100 companies listed in the New York stock exchange (Nasdaq) which makes Israel the third after the USA and Canada
- The funds invested in early phased high tech enterprises by state programs are paid off directly and the indirect effect is 5-10 times of the funds (foreign capital, increasing of the export, employment) (Korányi-Turi, 2010)

The Israeli innovative, start-up orientated ecosystem's main characteristic is the continuous cooperation of the state programs and the private sector often with new connecting methods. The technology incubator program was launched in the beginning of the 90s, taking the US business incubators as sample, the aim was to help the university research results' industrial exploitation. The other aim of the program was to provide employment to the numerous Russian immigrants qualified on the field of science and technology. After a few years the incubated enterprises had started to get out from the incubators but they couldn't able to get more investments from the market because the early phased venture capital industry wasn't exist in Israel at that time.

Therefore Yozma (initiative) program was launched to create 10 early phased technological venture capital funds. The state provided 40-50% of the planned 20-20 million USD capital to decrease the private investors' (capital funds, private individuals, foreign venture capital investors) risks. The private investors had an option to buy out the state's share with 5% interest. The funds were so successful so every state share was bought out within five years. The funds of the Yozma program handle about 5 billion USD and the investments activities started up by their effects attracted some of the best foreign early phased funds to Israel. The Office of the Chief Scientist (hereinafter: OCS) was responsible for Yozma (Korányi-Turi, 2010).

The technological incubator reduces state risk and the burden of state offices with the pre-selection performed before awarding of grant payments and with the in-progress monitoring. The incubator, in case of a successful project, ensures further capital investment, since the lack of further capital would lead to a loss of value for the company set-up till that time.

3 Research Design and Methodology

3.1. Research Design and Data Collection

This paper is exploratory by nature, meaning we try to explore the different factors influencing start-up firms operating with and without support of incubators. The questionnaire was constructed using developed and validated scales from Hacket and Dilts (2008) and CSES (2002). Based on extensive literature review and analysis of NIS in Finland, Hungary and Russia, the list of external factors was compiled and start-ups' attitude analysis was conducted using Likert scales (from 1 to 7).

The case studies were chosen as research methodology (Eisenhardt, 1989; Yin, 2003) in order to enhance the discussion with start-ups and let companies give feedback in order to improve the questionnaire for future survey studies.

As it was mentioned earlier, we have chosen 9 start-ups (3 per country) from Finland, Hungary and Russia. The selection criteria were operation in incubator (in part, present or intention to enter incubator in the future) and high-tech orientation of the firms. The semi-structured interviews were conducted in person or by phone. The respondents were the directors (presidents, general managers) of the companies. Interviews lasted from 1 to 2 hours.

3.2. Case Companies Description

The case companies were established between 2006 and 2013 (Table 2). Finnish companies do not have operations in any other site; hence one Russian firm and all Hungarian have operations outside business incubator. Finnish and Russian companies show the increase of amount of personnel between 2011 and 2013.

Table 2 Summary of the case companies' information

	Finland			Hungary			Russia		
	1	2	3	1	2	3	1	2	3
When you company entered incubator? Year	2010	2013	2006	2012	2007	2013	2011	2013	2012
Is the company's main site in incubator?	Yes	Yes	Yes	No	Yes	No	Yes	Yes	Yes
Does the company has operations elsewhere?	No	No	No	Yes	Yes	Yes	No	No	Yes
Personnel: How many people does the company employ at the incubator location? Number of full time staff	1	0	2	0	12	-	0	0	3
2011	2	0	3	0	13	-	6	0	5
2012	4	1	3	0	18	0	4	1	5
Number of part time staff	0	0	2	-	1	-	2	0	0
2011	1	0	3	1	1	-	0	0	0
2012	3	2	3	1	1	0	2	3	0
2013	3	2	3	1	1	0	2	3	0
How many people does company employ at other locations?	2	0	0	1	8	7	0	0	0
What type of qualifications does your company's staff have? U- university degree	U	U	U	U	U	U	U	U	U
Turnover (euro thousands) 2011	20	0		16	1000	-	0	0	
2012	100	0		116	900	-	0	0	
2013	150	10		N/A	1100	N/A	1	0	
Approximate what proportion of company's turnover is invested in R&D (R&D Intensity)?	10% and more	3-5	0-0.5	0-0.5	10% and more	N/A	10% and more	n/a	10% and more
Approximate what proportion of company's turnover is invested in training?	10% and more	0-0.5	0.5-1	0-0.5	1-1.5	N/A	0,5-1	n/a	10% and more
Where are the company's main customers?	FIN	FIN	FIN, INT	HU	INT	N/A	RU	RU	RU
Where are the company's main competitors?	INT	INT	FIN, INT	HU	INT	N/A	RU	RU	RU

In spite of the fact that all companies identify themselves as high-tech firms, the R&D intensity indicator doesn't correspond to level of high-tech in many firms (OECD, 2009). In fact, only one Finnish firm, one Hungarian and two Russian firms reported R&D intensity of 10 % and more. The rest reported either lower level of R&D intensity or have not provided answer to the question.

The customers' analysis reveals that the start-ups in all analysed countries are oriented on the domestic markets, with exception of one Finnish and one Hungarian firm. However, case companies are well aware of the core competitors both locally and internationally. Due to the size of the markets and product specific, Finnish companies

indicate mostly international competitors, Hungarian have both local and international, and Russian firms compete only on local market.

4 Findings and Discussion

4.1. Entering the Business Incubation

All our respondents were asked to specify the aims they had when decided to become a resident of business incubator. These aims are summarised in table 3. Finish companies aim to decrease costs, use the consultancy and mentoring services offered by incubators, and participate in free trainings, incl. entrepreneurship training. Hungarian firms aim for cost efficiency and developing business knowledge as well, but also to find cooperation partners and networking. Russian start-ups came to incubators to use the consultancy and mentoring services offered by incubators, to get working space (offices) and help with finding investors.

Table 3 Aims when entering incubator

<i>Aims</i>	
Finland	<ul style="list-style-type: none"> • Decrease expenses • To get skills in entrepreneurship (free training offered by incubator) • Training, consultancy of specialist, mentoring services
Hungary	<ul style="list-style-type: none"> • Cost efficiency • Cooperation, • Development and business knowledge
Russia	<ul style="list-style-type: none"> • Consultancy services, expanding opportunities for investors search, fablab • Working space (office), consultancy and mentoring services • Consultancy services, experts advises, mentoring

The companies were asked to evaluate the role of different external factors, influencing their decision to become residents of business incubator (Figure 6). Hungarian firms evaluated role of external factors much higher than Russian and Finnish start-up, with only exception of governmental support for entrepreneurs. The diversity in evaluations of roles of some factors is also high. R&D transfer and Physical infrastructure are the most important factors (mean 5,333), followed by policy regulations, cultural and social factors, commercial and legal infrastructure, and access to finances (mean 4,0). Least important factor is political situation in country (2,667). Political stability, market openness and education level are the lowest influencing external factors in all analysed countries, regardless the market turbulence difference.

In case of Finland, there is no high diversity in influence of the external factors: mean indicator varies from 2,333 to 3,333. Access to new technology (R&D transfer, networking), cultural and social factors and governmental entrepreneurship programs are the most influencing factors for Finnish firms (mean 3,333). Policy regulations and access to finances were considered of least important.

Russian companies were attracted to incubators by governmental entrepreneurship programs (3,667). The least important factors for Russian firms are political environment and policy regulations (1,0).

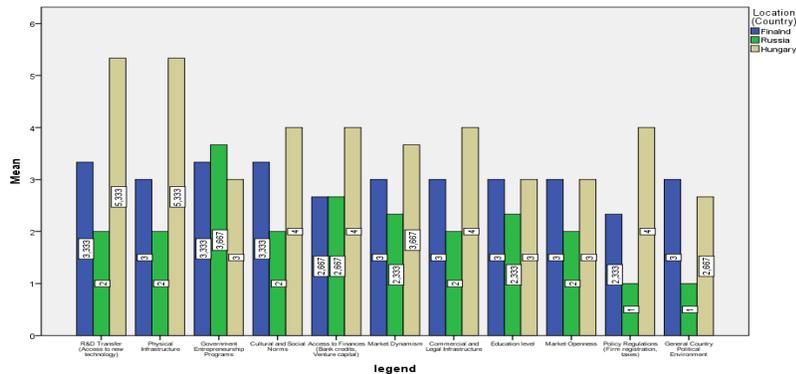


Figure 6 External factors influencing the decision to enter business incubator (1 – not important, 7 – most important)

The role of government on the incubates was evaluated as “no influence” by 4 firms, as positive by 3 firms, and as negative by 1 Hungarian firm (table 4). Companies wish government would initiate more cooperative project, support and mentoring services, and support programs. No country specific was revealed. Hence, some Hungarian and Russian firms also wish that government pressure would be minimized and support is not needed.

Table 4 Role of Government

	Was this influence of government on your business...	Do you feel that you company succeeded thanks to the favourable governmental policy?	What do you think government / regional authorities do to support start-ups?
Finland	<ul style="list-style-type: none"> Positive No influence 	<ul style="list-style-type: none"> I don't know No I don't know 	<ul style="list-style-type: none"> More cooperative projects Support programs, cooperation Mentoring services
Hungary	<ul style="list-style-type: none"> Positive No influence Negative 	<ul style="list-style-type: none"> Yes I don't know No 	<ul style="list-style-type: none"> government is supportive Not necessary this kind of supports Nothing
Russia	<ul style="list-style-type: none"> Positive No influence No influence 	<ul style="list-style-type: none"> No No No 	<ul style="list-style-type: none"> Support programs, cooperation Information, facilitation of business registration Not to disturb

Business incubators play the same role in different countries – to support establishing and development of new companies, but they have different services and the companies’ perceptions of the incubators’ services is different. Companies enter business incubator due to favourable location, image, quality, price and flexible terms for incubation units, availability and quality of professional business support services, clustering and opportunity to network. For Finnish firms (Figure 7) the most attractive are availability and quality of professional business support services (6,667) and quality, price and flexible terms for incubation units (5,333). Hungarian firms indicate clustering and opportunity to network (6,0), favourable location (5,0) and availability and quality of professional business support services (4,333). For Russian firms most important are availability and quality of professional business support services (4,333) and quality, price and flexible terms for incubation units (4,333).

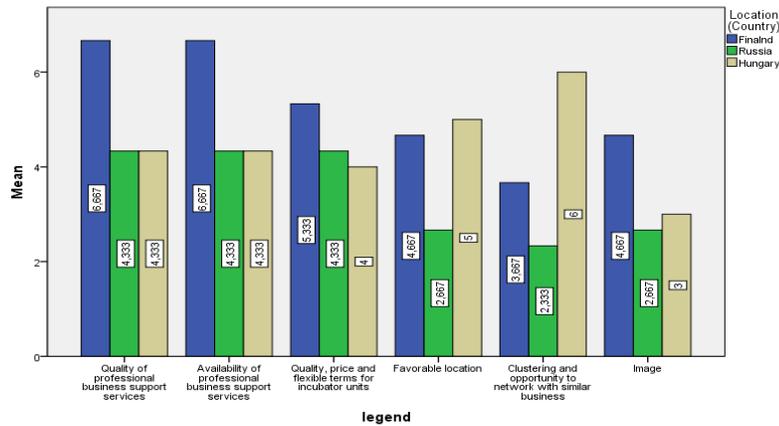


Figure 7 Reasons to enter Incubator (1 – not important, 7 – most important)

Traditional business incubators provide pre-incubation services, consult on business planning and establishing company, organize business skills developments trainings, advice on new product and services development, help with raising finances (bank loans and venture capital) and advice on recruitment. The result of companies' perception of these core and supportive services are presented on Figures 8 and 9. The most important services for Finnish firms are trainings and consulting on NPD and business planning. Hungarian firms underline recruiting services, trainings and business planning. Most important core services for Russian firms are access to grants and venture financing, and pre-incubation services.

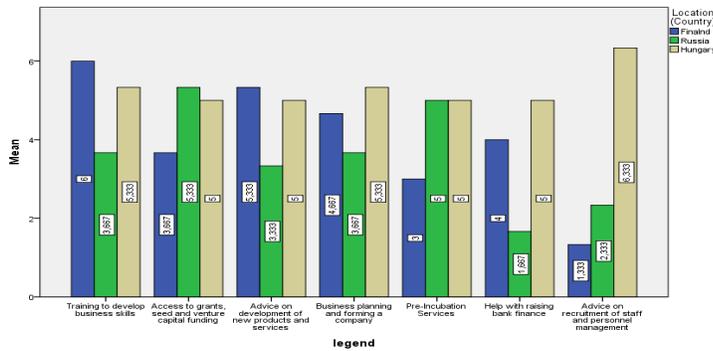


Figure 8 Perception of Incubator Services (1 – not important, 7 – most important)

4.2. Constrains and problems

The start-up companies, as mentioned earlier, often struggle different constrains to achieve stable growth rate. Finnish market is mature, competitive and has higher demands to innovative companies. That's why, Finnish start-up have to stand more fierce competition flight compared to other, not as innovative and high-tech markets. Finnish firms mention (Table 5) sales growth, company strategy, vision, and specific product characteristics as the main constrains to be able to achieve stable growth. Hungarian firms struggle with lack of financing, customers, business skills and not satisfying sales

amounts. In the same time Russian firms also indicate sales problems (like Finland and Hungary), product characteristics (like in Finland), and business skills (like Hungary).

Table 5 Summary of the main problems

	<i>Problems</i>	Can Incubators help to solve the problems?
Finland	<ul style="list-style-type: none"> • Niche products, complicated to enter Finnish market • Sales • Missing the good understanding of general strategy of the company 	<ul style="list-style-type: none"> • Mb, PR support • Mb • Yes
Hungary	<ul style="list-style-type: none"> • Lack of financing, solvency • Find potential customers and sales • Lack of the change skill 	<ul style="list-style-type: none"> • Yes • May be • May be
Russia	<ul style="list-style-type: none"> • No advertisement and sales • Not enough skills in business development • Market is difficult, new product (unknown), lack of financing 	<ul style="list-style-type: none"> • No • Yes • Partly

5 Conclusions

The success of the technology incubators depends on the optimal synchronization of the public and private actors. The government as a non-refundable grant take over the predominant part of the investment of the R&D projects what is too risky as a first one to the private investors, and in the same time the technology incubator – what is in majority property of private owners – in order to its property in the incubated company and in a less part in its invested capital not just „supervise” the activity of the company which won the contest, but do everything for its success. Its interest is in the drastic growth of the company’s value. The incubator reduced the public risk. The cooperation of the incubators with the universities make them an important regional development actor, they will help to spread the real creative entrepreneur culture and can involve the bachelor, master and PhD students of the university into the work of the start-ups, and can show how the scientific results becomes business success.

In case of a successful investment the incubator take care about the further capital investment, because without this capital the so far achieved company could lose its value. On the basis of the international (Israel, Finland) experience the success of the technology incubators will results the presence of the R&D based technological companies of the given location at the world market in a longer way, and a significant valued-added export revenue.

The Israeli and the other international experience shows that a little and effective group (with 3-4 person) is needed at the organization of the incubator whose task not just to manage the contests one by one but the continuous contact with the technological incubator and the evaluation. Between the aspects of the evaluation the inquiry of added value of development of the starter company by the incubator is the primary. However the government’s preparation and introduction of the “incubator law package” is needed in the given country.

This paper aimed to study differences and similarities in cases of high-tech start-ups’ incubation in Finland, Hungary and in Russia – countries with different institutional setting and market turbulence. After analysing the case studies we got support for some of our research propositions. Such as, we noticed that the implementation, operation and performance of business incubators in different countries present great diversity and heterogeneity (RP1). The incubates in developed countries (Voisey et als, 2004, Aerts et

als, 2004) and countries with higher uncertainty and market turbulence (Somaya and Teece, 2007; Bröring, 2010) evaluate the aims and operations of the BIs differently. The Finnish companies have more trust towards the governmental measures, and in case of Hungary and Russia, firms claim the unfavourable environmental conditions influencing their entrepreneurial decisions (Misra et al., 2012).

We have found reverse support for RP 2, in reality start-ups do not have high expectation on governmental support on early stage of development (Garnsey, 1998). The higher the market turbulence, the lower level of NIS development, the less trust companies show towards the role of government. Hence the specific government entrepreneurship programs may enhance opportunity recognition, and facilitate creation of new ventures (Shane, 2003) in Russia. Companies wish government would initiate more cooperative project, support and mentoring services, and support programs. No country specific was revealed. Hence, some Hungarian and Russian firms also wish that government pressure would be minimized and support is not needed.

We got partial support for RP3 “On early stage of development, residents of business incubators, have rather high expectation on support on operations, dealing with complication, and securing companies’ growth”. Incubators, private or public, provide resources enhancing the creation of new small firms and also support, directly or indirectly, the corporate spin-offs (Löfsten & Lindelöf, 2001). The start-up companies often struggle different constraints to achieve stable growth rate. Finnish market is mature, competitive and has higher demands to innovative companies. That’s why, Finnish start-up have to stand more fierce competition fight compared to other, not as innovative and high-tech markets. Finnish firms mention sales growth, company strategy, vision, and specific product characteristics as the main constraints to be able to achieve stable growth. In the same time they expect to use the consultancy and mentoring services offered by incubators, and participate in free entrepreneurship training to be able to overcome the challenges.

Hungarian firms struggle with lack of financing, customers, business skills and not satisfying sales amounts. They aim for cost efficiency and developing business knowledge as well, but also to find cooperation partners and networking with help of BIs. Russian firms also indicate sales problems (like Finland and Hungary), product characteristics (like in Finland), and business skills (like Hungary). They came to incubators to use the consultancy and mentoring services offered by incubators, to get working space (offices) and help with finding investors. Location in BIs leads to enhancing growth of the case companies, success and promoting technology development of high-tech start-ups (Cui et al, 2010).

Business incubators play the same role in different countries – to support establishing and development of new companies, but they have different services and the companies’ perceptions of the incubators’ services is different. Companies enter business incubator due to favourable location, image, quality, price and flexible terms for incubation units, availability and quality of professional business support services, clustering and opportunity to network. For Finnish firms the most attractive are availability and quality of professional business support services (6,667) and quality, price and flexible terms for incubation units (5,333) – thus it is not enough to provide good infrastructure and physical services, there is a need for systematic business and management assistance for start-ups (Erikson and Gjellan, 2003). Hungarian firms indicate clustering and opportunity to network (6,0), favourable location (5,0) and availability and quality of professional business support services (4,333) in order to foster networking and cooperation of firms inside the incubator and in the local economy (Mian, 1996). For Russian firms most important are availability and quality of professional business support services (4,333) and quality, price and flexible terms for incubation units (4,333). We can

see from these results that perception and value of services, provided by business incubators are different for start-ups in different countries (RP4).

Results of analysis proved that institutional and NIS external factors influence companies decision to enter business incubator (RP) and role of these factors is country-specific. Finnish companies mentioned access to new technology (R&D transfer, networking), cultural and social factors and governmental entrepreneurship programs. Policy regulations and access to finances were considered of less important. Hungarian firms evaluated role of external factors much higher than Russian and Finnish start-up, with only exception of governmental support for entrepreneurs. R&D transfer and Physical infrastructure are the most important factors (mean 5,333), followed by policy regulations, cultural and social factors, commercial and legal infrastructure, and access to finances (mean 4,0). Least important factor is political situation in country (2,667). Political stability, market openness and education level are the lowest influencing external factors in all analysed countries, regardless the market turbulence difference. Access to new technology (R&D transfer, networking), cultural and social factors and governmental entrepreneurship programs are the most influencing factors for Finnish firms (mean 3,333). Policy regulations and access to finances were considered of least important. Russian companies were attracted to incubators by governmental entrepreneurship programs (3,667). The least important factors for Russian firms are political environment and policy regulations (1,0).

Policy recommendations and future research:

- Government should specify the taxonomy of the R&D or technology start-up, such as “Young Innovative Company” category and develop the supporting programs (contests, tax relief);
- Provision with the intellectual property. In case of the spin-offs of the universities and researching institutions the rules of the provisions with the intellectual property should be reviewed. From the viewpoint of the outside investors it is basically important that the institutions won't be able to prevent the utilization of the intellectual property what been invested into the starter company. At the same time it must be resolved that the institutions which play a role in the produce of the intellectual property should validate their economic interest with properly royalty and other financial constructions.
- Taxation of the intellectual property. It must be resolved that the inventors, researchers and the owners of the patents get deferred taxation after their intellectual property what they invested when the company started (or when the incubator made the first capital investment), which means that they do not had to pay the capital gains tax until it is actually realized.
- Tax reliefs. Usually the most important part of the company's tax relief is the capital gain tax relief. But the start-ups with R&D activity can't use this kind of tax relief in the beginning of its life cycle, that's why it would be better if they would be compensated with other discounts (e.g.: health insurance contribution).
- Toleration of the failure. In the countries which successful at the innovation area (mainly in the USA, but in Israel as well) the failure tolerance is much more than in other societies. As it is a mental question, it can't be changed by laws, but there are some areas where there are rules for it as well. The founder of a ruined innovative company should not be discriminate at the contest, but the successful entrepreneur experience should be an advantage. The negative consequences of the bankruptcy law should not be relates them if they are did not break the law.

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