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**INNOVATIVE ENTREPRENEURSHIP BY STARTUPS
AND SPIN-OFFS IN THE CZECH REPUBLIC**

Contemporary startups and spin-offs are considered to be innovative forms of entrepreneurship. These firms are usually small and medium-sized and they realize their activities in the field of information and communication technology. Business incubators provide subsidized rent, consulting in particular branches and other services. The aim of the paper is to analyze innovative entrepreneurship of startups and spin-offs in the Czech Republic and to monitor business incubators providing these firms important support during their start. The results are the review of business incubators and startups and spin-offs including their main characteristics. Empirical investigation is realized by using printed and electronic sources and followed by questionnaire survey of selected incubators focusing on the analysis of startups and spin-offs.

Keywords: business incubator; innovative entrepreneurship; spin-offs; startups; Czech Republic.

JEL Classification: M13, M21.

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**ІННОВАЦІЙНЕ ПІДПРИЄМНИЦТВО У ЧЕСЬКІЙ РЕСПУБЛІЦІ:
НА ПРИКЛАДІ СТАРТАПІВ ТА СПІНОФФІВ**

У статті показано, що стартапи та спіноффи можуть вважатися інноваційною формою підприємництва. Зазвичай це малі та середні фірми, які працюють у сфері інформаційних технологій та комунікацій. Бізнес-інкубатори допомагають їм шляхом надання оренди приміщень за пільговою ціною та консультування у різних сферах бізнесу. Проаналізовано розвиток інноваційного підприємництва у Чеській Республіці на прикладі стартапів та спіноффів, показано, яким чином бізнес-інкубатори сприяють їх розвитку на початкових етапах. Емпіричний збір даних було проведено з використанням друкованих та електронних матеріалів, після чого було проведено опитування в обраних інкубаторах з акцентом на розвитку в них стартапів та спіноффів.

Ключові слова: бізнес-інкубатор; інноваційне підприємництво; спінофф; стартап; Чеська Республіка.

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**ИННОВАЦИОННОЕ ПРЕДПРИНИМАТЕЛЬСТВО В ЧЕШСКОЙ
РЕСПУБЛИКЕ: НА ПРИМЕРЕ СТАРТАПОВ И СПИНОФФОВ**

В статье показано, что стартапы и спиноффы могут считаться инновационной формой предпринимательства. Это обычно малые и средние фирмы, работающие в сфере информационных технологий и коммуникаций. Бизнес-инкубаторы помогают им путём аренды помещений по льготной цене и консультирования в различных сферах бизнеса. Проанализировано развитие инновационного предпринимательства в Чешской Республике на примере стартапов и спиноффов, показано, каким образом бизнес-инкубаторы способствуют их развитию на начальных этапах. Эмпирический сбор данных был проведён с использованием печатных и электронных материалов, затем был проведён опрос в выбранных инкубаторах с акцентом на развитии в них стартапов и спиноффов.

Ключевые слова: бизнес-инкубатор; инновационное предпринимательство; спинофф; стартап; Чешская Республика.

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1. Determination of contemporary issues of innovative entrepreneurship in the Czech Republic

Enterprise environment influenced by globalization and hyper-competitiveness, leads to the change of competitive advantage by that also to change of competitive strategy of business entities. It is obvious that competitive advantage in terms of low price or high quality is today not sufficient. Innovation or innovative enterprises are the basic elements in the case when a firm wants to be the winner at a particular market. Firm competitiveness leads to competitiveness of the whole economy and that is why innovative enterprise is supported by creating innovative infrastructures. Business incubators are part of that infrastructure and they support commercialization of innovative ideas.

Incubators help emerging of new startups and spin-offs. Incubator helps innovative firms to transfer their ideas into final forms in reasonable time and at the situation of lack of starting capital. We consider them to be small and medium-sized enterprises, highly innovative that do not have enough starting capital and that are expected to earn high profit after overcoming their barriers.

In the realized analysis of Ministry of Industry and Trade it is obvious that the share of innovative enterprises in the Czech Republic is under European average (in 2004–2006 only 35% of enterprises technically innovated in the Czech Republic causing this state is under the EU 27 average, with its 39% of innovative firms). In the Czech Republic there is a high share of innovative firms without protection of intellectual property rights. There is also a lower number of firms with technical innovation that is newly introduced at the market. Foreign subsidiaries are more active in innovations in the Czech Republic – 63% of foreign firms had innovated compared to 47% of innovative Czech firms.

For innovative processes at Czech firms high importance of transfer of knowledge by buying machines and tools is very typical. Innovative process of Czech firms can be characterized as the acceptance of developed technologies, processes and other methods related to production more than introducing own unique solutions.

The aim of the paper is to analyze innovative entrepreneurship of startups and spin-offs in the Czech Republic. Considering irreplaceable role of incubators in support of innovative entrepreneurship there will be realized monitoring and created a summary (review) of existing incubators including the description of their main characteristics (e.g., localization, provided area for hiring, length of existence etc.) in particular regions of the Czech Republic.

2. Theoretical background of innovative entrepreneurship

Innovative entrepreneurship contributes to transfer of R&D into industrial life. To succeed at a market, firms must realize innovative activities and offer new products and services. It is obvious that small and medium-sized enterprises can realize products with high level of application of scientific findings. These innovative small and medium-sized enterprises have more flexible processes of a management product life cycle, which means it's shorter compared to larger firms (innovative periods are longer). Konecny (2001) defines innovative firm as the one oriented on using findings of the research and development and perfection of new technologies.

Innovative firms confront great enterprise risks as they introduce and develop new products. It can happen that a new product is not successful at a market or a new

product is successful and brings greater profit than anticipated. The level of risk is influenced by the realized strategy. The highest risk appears when realizing offensive strategy that is focused on original innovations (own R&D activities). Smaller risk arises when realizing defensive strategy oriented on the development of existed products, services and technologies. At an innovative firm, the least risky is the license strategy. This strategy is based on reaching outside know-how, such as licenses. At the same time, innovative small and medium-sized firms in comparison with large firms are able to react quickly to changing needs of a market, quickly implement findings from research and development, thus assuring the viability of new ideas.

On the other hand, innovative small and medium sized enterprises face a high level of uncertainty at the time new products or technologies are introduced and with a critical need of basic and operating capital (banks are not interested in these firms). It follows that a start is very difficult for small and medium-sized firms. Considering importance of these firms, state, regional institutions, universities etc. have an essential role via innovative workplaces for the development of these firms, such as research and technology centers, parks with incubators etc. These business incubators create suitable environment for innovative entrepreneurs.

2.1. Business incubators. Business incubators are only one of possible supports for innovative firms and because they create an important consulting platform, office rentals in incubators include the services in the fields of marketing, finance and managerial skills for entrepreneurs. Incubator and science parks with their structures are important policy tools to support startups that are evaluated as the most promising, including also spin-offs (O'shea et al., 2005; Link, Scott, 2007).

There exists a number of different definitions of business incubators. For example, according to the US Small Business Administration, business incubator provides physical facilities that offer new firms a supportive network necessary to increase their likelihood of survival during the early years when they are most vulnerable. The next definition comes from Australia. The Commonwealth Department of Industry, Tourism and Resources defines business incubators as a facility designed to assist new and growing business to become established and profitable by providing premises, advices, services and support. The incubation period is normally 1–3 years, during which businesses can become established before entering wider business community (DEWRSB, 2001). Finally, a business incubator is generally described as a facility that provides favorable controlled conditions to aid the growth of new ventures (Petree et al., 1997). We can deduce that common features of the mentioned definitions are physical facilities, space, advice services, and other support in the first 3 years.

The first business incubator was founded in Batavia, New York in 1959. The name "incubator" was connected with a man that produced poultry (Brown et al., 2000). The incubator concept spread internationally. The concept of business incubators took off slowly with universities during the following 20 years. One of the first business incubators in Europe was founded in France (Cambridge Science Park and Sophia Antipolis) in the late 1960-s. The dispersion of business incubators to the rest of Europe was relatively slow. Incubators exist not only in developed Western countries but also in developing nations such as Turkey, Nigeria and Brazil (Lalkaka et al., 1996).

Following the creation of science parks in the 1980-s, incubators have become a key instrument used by universities in the 1990-s to promote startups (Wright et al., 2007).

Konecny (2001) defines the types of business incubators:

- public and non-profit incubators – their aim is economic development of a region (financed by government or non-profit institutions);
- university incubators – their aim is to realize university research and teaching goals (they appear at universities);
- private incubators – their aim is to transfer findings from certain industrial branch to business reality (are established by professional entrepreneurs by using own capital or by capital companies that aim to participate in innovative entrepreneurship in these incubators);
- hybrid public-private incubators – these incubators implement new ideas using state funds and other sources of finance (partnership of state, non-profit agencies and private sector).

According to Hackett and Dilts (2004b) incubators are financed chiefly by public money and have strong links with authorities at regional and local levels. The incubator model is frequently developed within a science park structure, of which an incubator is an important cornerstone. For an advance discussion and the distance between science park and university and the importance of proximity, see Link and Scott (2007, 2006, 2003) and Wessner (2009). According to National Commission on Entrepreneurship (2000), incubators in North America have added 19000 companies and more than 245000 jobs to the economy.

In Europe, the strategy of forming business incubators is equally popular. European governments have established a series of programs to develop and promote incubators in general and technology-based incubators in particular. New types of incubators, such as e-incubators, are also being financed.

In Poland, incubators act in a form of foundations, associations, agencies and companies. The Academic Entrepreneurship Incubators are institutions in Poland, aimed at promoting entrepreneurship. They serve in 30 universities and take care of more than 900 companies (Dziuba, 2011). Incubators are dedicated to companies that come into being, or companies in existence for two years or less (in some incubators, not longer than a year). They are the so-called startups. In Poland, there are:

- academic entrepreneurship incubators (pre-incubators),
- entrepreneurship incubators,
- technology incubators.

The majority of incubators set up nowadays are located in technology parks. Many German incubators and technology centres are organized in the ADT (German Association of Innovation, Technology and Business Incubation Centres). Some 157 technology centers are organized in the ADT, and they include 5800 companies and 46000 employees. Technology centers support 17400 successful companies financing with more than 120000 new jobs. Companies that start in a technology center have the survival rate of 90%. More than 8000 companies leave a technology centre and start growing. They created more than 90000 new jobs (Tehen, 2011).

2.2. Startup firms. According to the English-Czech explanatory dictionary a startup is something such as a new business you create or cause to start. According

to the Association of University Technology Managers startups are those companies initiated solely on the basis of university technology. This association's survey reported that 17% of US university technology agreements were with start-up companies, 51% – with small companies, and 32% – with larger companies. Startups are an increasingly important source of growth for the US economy. To help facilitate start-up efforts, enterprising universities sometimes allow the university-related start-up to rent lab benches within the university. Others provide support services both before and after licensure is complete (Kulakowski, Chronister, 2006). Considering these facts, a startup represents any starting firm regardless the field of operations. But this notion started to be used in connection with Internet business, which is why today a startup means starting a firm developing or using new technologies or the Internet. Startups can be divided into 2 groups, according to participation of outside investors: financed and non-financed. The main goal of a startup is to grow or to better position itself at a market compared to competitors. Founders of these firms focus on finding a market niche they aim to fill and to create a temporal monopoly (Bartos, 2002).

2.3. Spin-off firms. According to the English-Czech explanatory dictionary a "spin-off" is something useful that unexpectedly results from an activity. Polacek and Attl (2006) defined a spin-off firm (sometimes we can find "spin-out") as one that rises by using intangible assets as capital stock into a newly rising corporation (e.g., university know-how). Shane (2004) defines a university spin-off firm such as a newly established firm that partially uses intellectual assets that come from some university. Kislingerova (2011) defines a spin-off firm, but at the same time divides these firms into 2 groups: one group includes academic workers that are university employees or students, and the other is formed by formal workers, i.e., university graduates. Legislation on the ownership of a new idea (invention) plays a very important role. In the first case, ownership is at the side of a university. The second case represents an exception. The greatest number of graduates starts to do their own business a few years after school attendance, after they get some experience. "Academic spin-offs are firms that are formed at universities with participation of university employees by using intellectual assets formed at the university" (Kislingerova, 2011).

Academic entrepreneurship is the consequence of entrepreneurial university. Business university workers became in research of entrepreneurship a favorite notion. Universities try to improve commercialization of their own knowledge, and they seek to use their sources such as licenses, research cooperation, or forming new firms. Academic entrepreneurship means not only academic innovative firms such as spin-offs.

The literature focused on spin-offs emphasizes the key role of a researcher who becomes the manager (Lockett et al., 2003; Murray, 2004). According to the case study on Turin (Salvador, 2010) spin-offs are young firms with little capital and few employees. Most of these are service firms rather than product ones. The main sector of activity are biotechnology and chemical-pharmaceutical, aerospace and transport, informatics and telecommunication and environment. These are the sectors in which Turin incubators and science parks as well as the Polytechnic and the University, are most specialized. These spin-offs are microfirms but deal mostly at the international market (Salvador, 2010).

According to the literature, spin-off founders are influenced by the desire of autonomy and independence (O'shea et al., 2005; Shane, 2004), and the possibility to use reached research results. It is necessary to consider the results of the case study of Turin which was based on interviews and the questionnaire. It was determined that in general, academics choose not to leave university jobs (Salvador, 2010). The fact is that the inventor does not have to run a new firm every day. He can be involved in technical activities of the innovation (Wright et al., 2004b).

The growing role of science parks in helping universities balance their 21st century missions in education, research and commercialization is necessary (Wessner, 2009). According to statistical results of Link and Scott (2007) "the organizational nature of the university-park relationship is important". Universities with a connection to spin-off firms are a key tool for research results implementation. The positive attitude of universities to spin-offs is a recent phenomenon (Wright et al., 2004b; Shane, 2004).

3. Methodology description

Research survey focused on innovative enterprise by startups and spin-offs was realized by using monitoring and questionnaire survey. Enterprise incubators mapping in the Czech Republic was realized by using monitoring. Monitoring means targeted monitoring of ongoing phenomena in business. Monitoring can be focused on the surface survey of statistical data or surface research.

Due to the lack of systematic data on business incubators, monitoring was carried out through the surface research by using available informational sources (printed or electronic). Monitoring was aimed to determine the number of incubators in the Czech Republic, to determine the location of incubators in different regions (14 regions), to determine the founder and the keeper, area of incubators and offered services for startups and spin-offs. At the same time there will be used analysis that was worked out by Ministry of Industry and Trade (Narodni inovacni strategie Ceske republiky, 2011). To complete the data we used the data from experts in the field of innovative enterprise.

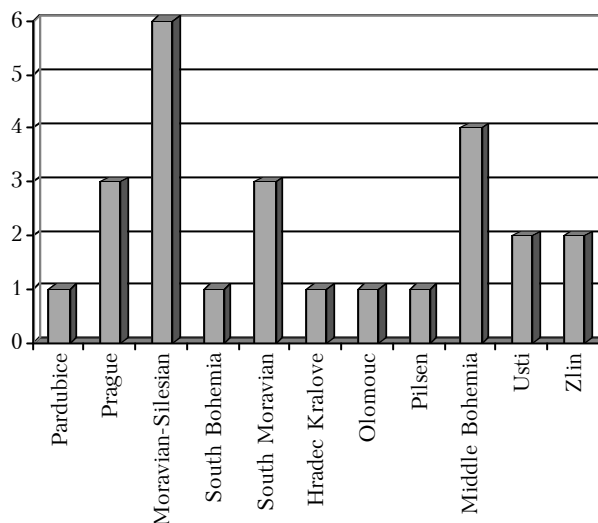
Finally there was a questionnaire survey realized at the selected incubators. This research was focused on gaining data on the activities of startups and spin-offs. All the incubators that were monitored were contacted. 24 incubators were asked for participation in the survey. 6 of them did not provide the needed data. The main sense of the realized survey was getting the review on the number of newly raised startups and spin-offs in their fields of operations, on the length of their existence, average length of cooperation with incubator and preferred services provided by incubators. In order to get these data there was a list worked out of 10 questions and the management of these incubators provided answers.

4. Empirical findings of the survey realized in the Czech Republic

4.1. Monitoring of Czech business incubators. Business incubators started to appear very rapidly in 2004 (when the Czech Republic became a part of the European Union and since that time this country has the possibility to use European funds) considering the possibility of using structural funds. Ministry of Trade and Industry worked out an analysis that shows the development of services provided by business incubators is spontaneous. There exist differences among regions in the number of incubators as well as in services provided by them. At the same time in the analysis it

is mentioned that for innovative entrepreneurship it is very important to cooperate among institutions, but it was found that these institutions are more like competitors.

It was found out that no institution files the raised incubators. That is why we suppose that in this research we were not completely successful in gaining the final number of all incubators in the Czech Republic. On the other hand, some incubators that were asked for the needed data did not provide any feedback. The basic data need for our research on the incubators in particular regions were gained by using the web sites of Science and Technology Parks Association CR, the web sites of the regions and also the web sites of particular incubators. The results of the monitoring are worked out as the summary of business incubators. The total number of found incubators was 29, while 5 of them have already finished their activities. That means that there exist 24 operating incubators at this time in the Czech Republic. At 6 incubators there was not possible to get the necessary data.



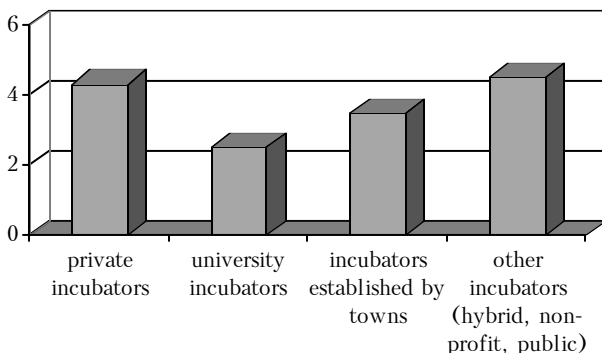
Source: Own empirical investigation based on the questionnaire survey.

Figure 1. The number of incubators in the selected regions

The results of monitoring are the basic data on the number of incubators in particular regions, about their founders and operator, users, about the space they offer and the length of existence. The biggest number of incubators is in Moravian-Silesian Region (6). On the other hand the smallest number of incubators (one in each region) is in Pardubice Region, South Bohemia Region, Hradec Kralove Region, Olomouc Region and Pilsen Region.

The largest group of incubators (44%) realizes its activity from 4 to 6 years; the second biggest group (33%) is the group of incubators that provides their services for more than 6 years. Only 23% of all monitored incubators exist 3 or less. The oldest incubator is BIC in Brno (21 years). The second oldest incubator is BIC in Pilsner and Podnikatelske a inovacni centrum in Most (15 years). The incubator that provides the largest area of square kilometers for starting entrepreneurs is Technology incubator VUT in Brno (7000 m²). Provided services do not differ too much among incubators.

Considering the founders of incubators it appears the incubators are established by towns (e.g., Podnikatelske centrum Rumburk), by universities (Podnikatelsky inkubator at VSE in Prague), or by other subjects (e.g., Technologicky inkubator VUT). There also appear incubators founded by private subjects, e.g. by a firm (STEEL IT – Inkubator Trinec). The biggest number of incubators were founded by more than one subject (50%). Very often the founders of business incubators are universities together with towns. There is the same amount of incubators founded by a town as well as by a university. Groups of incubators according to their founders are presented in Figure 2.



Source: Own empirical investigation based on the questionnaire survey

Figure 2. Incubators by their founders

4. Research of monitored incubators focused on startups and spin-offs

It was found out that business incubators help more startups than spin-offs. Innovative entrepreneurship by using spin-offs is not so enhanced. Because of that we evaluate together the number of startups and spin-offs.

The biggest number of startups (280) was arisen since the beginning of existence of Podnikatelske a inovacni centrum BIC Brno in South-Bohemia Region. Podnikatelsky inkubator and vedeckotechnologicky park (Moravian-Silesian Region) has 130 such firms. Technologicky inkubator VUT (South Moravian Region) has 119 firms. The numbers of incubated firms in particular regions (startups and spin-offs) are presented in Figure 3.

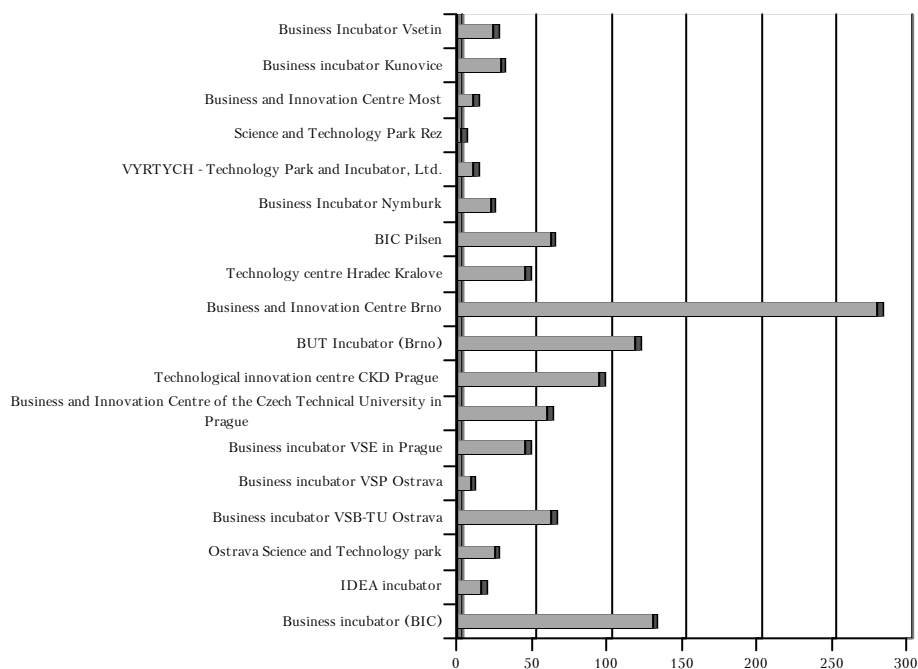
All 3 incubators provide their activities for more than 3 years. So that we can presume that these incubators are well operated and well-established incubators that have certain experience. At the same time we can deduce that incubators that operate shorter time have the smallest number of startups and spin-offs (see Figure 3).

In all incubators the sphere of operating is mostly information technology (programming) and information activities (activities connected with web portals, elaboration of data and hosting). Other activities are electrotechnology, environmental technology, engineering, building industry and robotics.

The average length of cooperation of startups and spin-offs with an incubator is about 36 months. At the same time it was found out that if there exists a science-technology park in a particular region further cooperation is transferred to this park.

The incubators offer nearly same services and also firms do require services that do not differ too much. They provide e.g. the area for operating for a privilege price,

advices in the sphere of project financing, help with business plan, advices in the field of law, accounting and taxes etc. Startup firms usually do not use financial resources from foreign investors (risk funds) such as business angels. Only a third (6) of all incubators wrote that only 10% of all newly established firms were successful in gaining finance resources from foreign investor. Rise of startups brings also new working places (employment). The biggest number of work places (670) was created in firms in IDEA incubator and the smallest number of new work places (maximum 10) was created in the firms situated in Technologicky park and inkubator Rez. Our finding is that the number of newly created work places relates to the length of existence of incubator and scope of business of newly established firms.



Source: Own empirical investigation using the questionnaire survey.

Figure 3. Number of firms that entered the selected incubators

5. Conclusion

Our empirical investigation addresses an important phenomenon – the rise of startups and spin-offs as a particular type of entrepreneurial entrant in innovation-oriented industries. Firstly, on the basis of publicly available data there was realized monitoring of business incubators in particular regions of the Czech Republic including their fundamental characteristics. It was followed by the analysis of innovative enterprise of startups and spin-offs by using the questionnaire survey at the selected incubators.

By monitoring, 29 incubators were found and 5 of them have finished their functioning. That is why in the Czech Republic, 24 working incubators were detected. It was not possible to gather the needed data from 6 incubators. The biggest number of incubators is in Moravian-Silesian Region – 6. The largest number of them (44%)

realizes their activities for 4 to 6 years. The most common founders are towns together with universities.

The results from the monitoring are worked out in a brief summary of business incubators including information on the number of incubators in particular regions, on their founders and operators, the time of existence and the area the incubators offer.

This part was followed by the questionnaire survey at 24 incubators (6 of them did not provide the needed data). It was determined that business incubators provide more assistance to startups than to spin-offs. In all the incubators, the sphere of operating is mostly information technology and information activities. The average length of cooperation of startups and spin-offs with an incubator is about 36 months. Only one third of all the incubators (6 incubators) mentioned that from the whole number of newly formed firms only 10% obtain financial resources from foreign investors. The number of newly created jobs is related to the length of existence of an incubator and to the scope of business of newly raised firms.

Startup and spin-off firms represent a distinctive class of entrepreneurial entrants that inherit knowledge from an industry through their founders. They are important innovators.

Regarding the gained findings of our research, further research will be focused directly into particular spin-offs and startups and finally there will be determined the factors of success of such innovative enterprise entities.

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