

The analysis of critical factors for science parks with emphasis on the venture capital fund provided by science parks

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Abstract

The paper deals with the perception of the science park business tenants to the different critical factors of the science park with emphasis on the idea of venture fund provided by science park. The quality factors of the science park are clustered into three groups (locality factors, quality factors and financial factors). The paper compares perception of these factors and it shows the role (and importance) of the venture fund to the tenants. In the conclusion the contribution gives recommendations for the science parks' managers and other possible investors which are willing to invest into high-risk but high-revenue industry.

Keywords

Venture Capital, Science Park, Startup, Investment

Introduction

Science parks are current phenomenon in the world of startup business. They provide various support for their tenants – which are mostly highly innovative startup businesses. Science parks have different factors which are important to their tenants or potential tenants such as rent price, quality of services etc. The paper deals with these factors dividing them into three categories - locality factors, quality factors and financial factors. Research described in the contribution is focused on gathering view on these factors by using internet questionnaire spread on current science park tenants.

1. Theoretical background

In the past years science parks gain important role in the Czech startup environment. Science parks are providing various support to their tenants, which are carefully selected from startup companies. Science park is trying to attract the best startups in the market therefore it is important to define which science park's factors are critical to the potential startup companies.

1.1 Science parks

Science parks are defined as “an organization managed by specialized professionals, whose main aim is to increase the wealth of its community by promoting the culture of innovation and the competitiveness of its associated businesses and knowledge-based institutions”. (IASP, 2014)

Science parks are one of the instruments for small and medium enterprises acceleration by providing facility, finance consultancy, advices from experts, comprehensive information and

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business development. (Carter and Jones-Evans, 2006) The definition of science park roles is given by Koh, et al. who states that science parks “play an incubator role, nurturing the development and growth of new, small, high-tech firms, facilitating the transfer of university know-how to tenant companies, encouraging the development of faculty-based spinoffs and stimulating the development of innovative products and processes.” (Koh, et al., 2003)

First science parks in the Czech Republic emerged in early 1990’s and they are aggregated and certified by Science and Technology parks Association CR. In 2014 there were 42 science parks acknowledged by Science and Technology Parks Association in the Czech Republic. (STPA, 2014)

1.2 Critical factors of the science parks

Zhang defines that science park’s factors can be divided into three main categories – park location, park preparation and park management team. According to the study the importance between the factors may vary. The study was conducted on EU and US science parks therefore it is applicable for both of these regions. (Zhang, 2004)

The perceived importance of the location factors are possible to see in the Table 1, where it is clearly stated that proximity to international airport and good road network are the most important (essential) factors for the science parks. (Zhang, 2004)

Table 1: Importance of location factors for a science park

Factor	Essential	Important	Relevant	Irrelevant
Proximity to supplier			*	
Proximity to domestic airport			*	
Proximity to international airport	*			
Proximity to seaport				*
Proximity to capital city		*		
Good road network	*			
Good rail link to capital city		*		

(Zhang, 2004)

Complex study made by CSES focused on science park benchmarking brings another view on the different factors why are science parks perceived as attractive to the tenants. The most important factors are location and quality factors. (CSES, 2002)

Table 2: Importance of location factors for a science park

Reasons for Locating at Incubator	Ranking (1=Most Important/4=Least Important)					
	1	2	3	4	Blanks	Average
Favourable location and image	32	24	5	2	8	2,6
Quality, price and flexible of incubator units	37	16	6	3	9	2,6
Availability of professional business services	7	8	25	11	20	2,8
Clustering and networking opportunities	2	9	12	21	27	4,2

(CSES, 2002)

Previous study made on the topic of location factors shows that most of the Czech science parks have similar location factors performance (Cizek, 2015) and therefore the differences in the Czech Republic are minor. However the question is how these factors are perceived by science park tenants in the Czech Republic.

Another part of the research is focusing on the role of the venture capital in the science parks. The study performed in 2012 by EBN shows that on one hand 100% of Czech science parks participate to public financial programmes, provides contacts with informal investors and have cooperation with bank loans. But on the other hand the supply of financing from own resources is nonexistent in the Czech science parks. (EBN, 2012) This paper is trying to identify whether there is any demand from tenants for this type of service or not.

2. Research methodology

According to the literature the science park's critical factors were divided into three main categories:

- 1) Location factors
- 2) Quality factors
- 3) Financial factors

These categories were enhanced by exact factors as it is shown in Table 3.

Table 3: Proposed critical factors for science parks

Location factors	Proximity of the science park to home
	Proximity to airport
	Proximity to capital city
	Proximity to highway
	Good rail link
Quality factors	Image of the science park
	Service quality
	Cooperation with corporation
	Facility quality
	Rent price
	Facility space flexibility
Financial factors	Investment from science park
	Investment from banks
	Access to EU subsidiaries
	Investment from external funds (Business angels)
	Business networking

(Author)

These factors were included into the questionnaire which were handed out to the tenants of acknowledged science parks by Science and Technology parks Association. The questionnaire were sent out to the sample of 255 companies using personalized email where respondents were informed about the nature of the research and ethical approach of the survey (ie. anonymity of the responses and data handling). Respondents could fill out the questionnaire by using link given to them in the email.

The questionnaire by itself was divided into five main parts – introduction, location factors, quality factors, financial factors and categorization questions. In the introduction, the purpose of the research was presented in more detailed form than in the email. The questions for the location, quality and financial factors were designed to follow Likert scale as it is shown in Table 4. (Meloun, 2012) Respondents were asked how they perceived different factors of the science park on the scale from very unimportant to very important.

The questionnaire also includes one question which is defined as “How do you perceive the possibility of venture fund available directly in your science park?”. The answers are also gathered on Likert scale. The reason is to identify whether tenants perceive venture fund which could be available for them directly in the science park as interesting.

Table 4: Likert design of the factors questions

Image of the science park is						
Very unimportant						Very important
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

(Author)

3. Research results

The questionnaire was sent to 255 companies and 27 of them responded, which makes 10,5% response rate. As it is possible to see from Table 5 in average the most important factor is quality of services in the science parks with average rank 6,27 points followed by rent price and business networking. On the other hand the least important factors are the location factor such as proximity to airport, proximity to capital city and good rail link. The financial factors such as access to the investment have mediocre importance.

Interesting result is that tenants value more when science park provides access to the EU subsidiaries than to private investors. This shows the strong dependency on the subsidiaries which are common in the Czech Republic.

Table 5: Critical factors for science parks

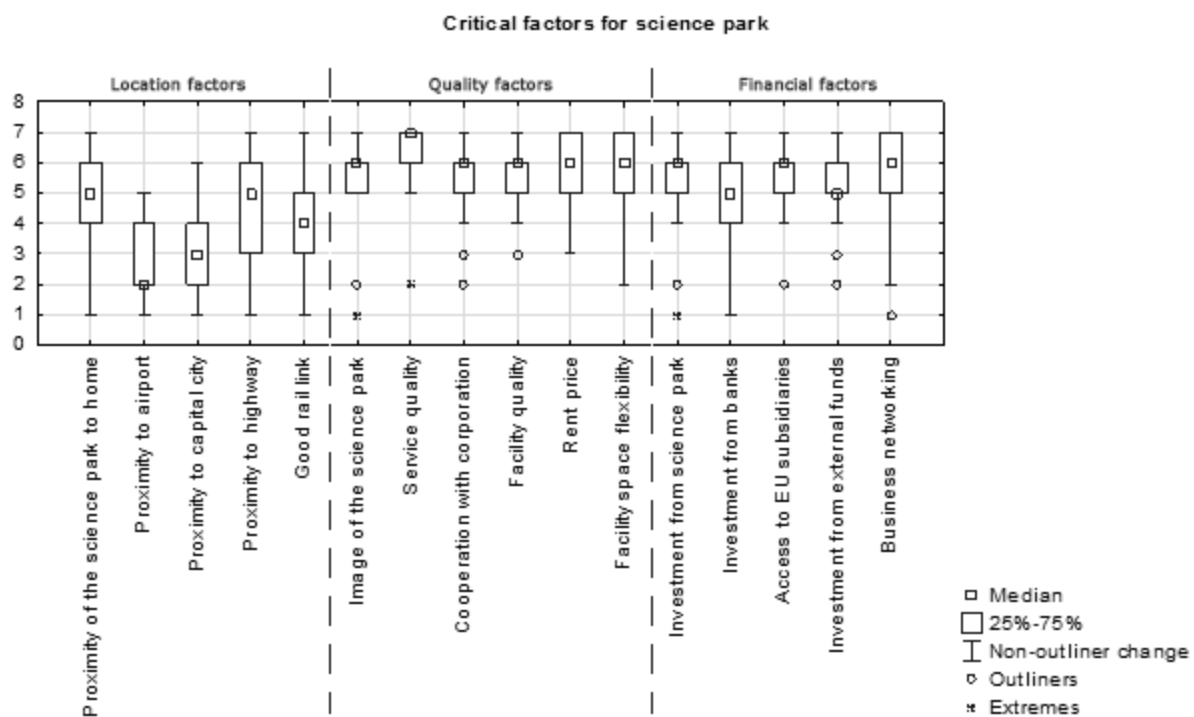
Critical factors for science parks	Ranking (1 - least important, 7 - most important)								
	1	2	3	4	5	6	7	Blank	Average
Service quality	0	1	0	0	2	10	13	0	6,27
Rent price	0	0	1	3	3	12	8	0	5,85
Business networking	1	1	0	3	3	6	13	0	5,81
Facility quality	0	0	2	1	6	11	6	1	5,69
Access to EU subsidiaries	0	2	0	2	6	9	7	1	5,58
Facility space flexibility	0	1	2	2	5	8	8	0	5,58

Image of the science park	1	1	0	0	7	14	4	0	5,56
Cooperation with corporation	0	1	1	3	6	10	6	0	5,52
Investment from science park	1	2	0	1	6	12	5	0	5,41
Investment from external funds (Business angels)	0	2	2	1	9	9	4	0	5,22
Investment from banks	1	1	2	3	7	7	4	2	5,04
Proximity of the science park to home	2	1	1	7	8	7	1	0	4,59
Proximity to highway	2	5	4	0	8	4	4	0	4,30
Good rail link	2	5	5	5	6	2	1	1	3,69
Proximity to capital city	3	10	3	7	3	1	0	0	3,00
Proximity to airport	6	9	5	6	1	0	0	0	2,52

(Author)

Another interesting view is on the distribution of the responses which is shown in the Figure 1. Location factors have the highest variability of responds which means that respondents have very different view on these factors. On the other hand respondents do have very similar opinion about quality factors, because the variability of the responses is very low. The similar result is for financial factors where the results tend to have low variability however unlike quality factors there are higher non-outliner change.

Figure 1: Critical factors for science park

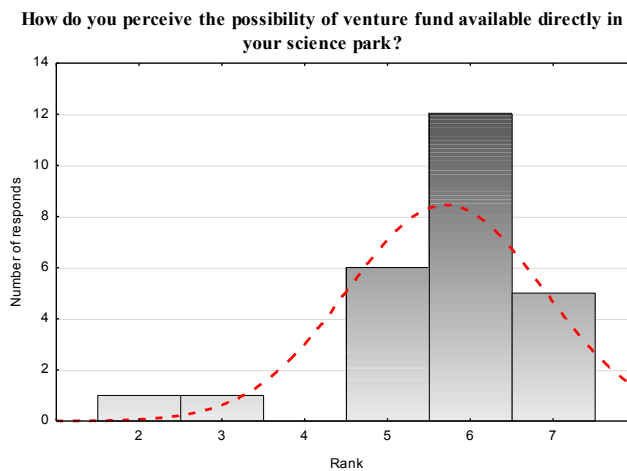


(Author)

The results for the question about perception of the possibility of venture fund which is available directly in the science park show very high average rank = 5,68 (1 - least interesting, 7 - most interesting). It describes that tenants perceive easily accessible venture fund through science park as very interesting. In comparison with the EBN study, which shows that supply

of financing from own resources are nonexistent in the Czech science parks, there is demand from the tenants for this type of financial service.

Figure 2: Distribution of the results



(Author)

Conclusions and recommendations

Science parks are fascinating tool for the early business acceleration. Science parks have different properties and provide various services to their tenants. These properties are reflected in the factors which are divided into three categories - locality factors, quality factors and financial factors. Every factor is viewed differently by tenants - some of them are perceived as more important than the other.

Research shows that tenants value quality factors more – especially quality of services and rent price. Service quality received rank 6,27 and rent price 5,85 on the scale from 1 to 7 which is very high. On the other hand the location factors such proximity to airport and proximity to capital city (with rank 2,52 and 3) are perceived as unimportant for the tenants. The financial factors received mediocre ranks (from 5 to 5,58). The most valued financial factor is access to the EU subsidiaries.

There are differences in the results between comprehensive study made by EBN focused on the EU science parks and the results from the Czech respondents. EBN study shows that quality and price factors are viewed less important than clustering and networking opportunities which Czech respondents perceived differently. Also proximity to the airport is not viewed as mostly valued factor amongst location factors.

The other part of the research dealt with the perception on the idea of the possibility of venture fund which is available directly in the science park. The results show that the idea is mostly viewed as very interesting – with average rank of 5,68. However this is in contradiction with current situation where supply of financing from own resources are almost nonexistent within Czech science parks.

The recommendations for the managers of the science park are set on the results of the research. The location is not crucially important to the tenants. Science park should more focus on the quality factors such as quality of services and rent price management which is valued more across the tenants. Also the support for the tenants in terms of access to the EU subsidiaries is perceived as significant. There is huge demand from tenants for the science parks' internal venture fund which would provide finance to the tenants from the own science park resources. It is interesting tool how science park is able to attract new perspective potential tenants and how to support the current.

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