The Expectations of Businesses Settled in a Science Park

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***Abstract*— Science parks are created to support the development and growth of knowledge-based businesses and to foster the economic development of a region. Based on an exploratory qualitative study, this research project aims, firstly, to understand the expectations of businesses established in science parks, which is not very well documented in the literature and, secondly, to highlight the motivations of a business to settle in a science park. In order to do so, the research is based on a constructivist approach. Twelve semi-structured interviews were conducted between September 2016 and April 2017 with managers of organizations established in seven science parks in the province of Québec, Canada. The analysis these interviews identified six major motivations of businesses to settle in a science park. It also revealed eleven major expectations of the science park's contributions for a business established. As a contribution, this research provides some recommendations not only for the managers of science parks, but also for the managers of businesses who want to be established in a science park. This research provides insights for science park managers about the incentives to set up to attract new business and about the support to provide for the business established in a science park in their development.**

***Keywords* — science park; expectations; motivations; clusters; geographical agglomeration.**

I. Introduction

Since the 1970s, more and more countries are setting up in science parks. According to UNESCO [1], there are now more than 400 science parks around the world. The literature revealed two types of science parks: linear and interactive. According to Cooke [2], the "linear" type is based on the localized agglomeration of companies and institutes of training and research without links or interaction between them. The "interactive" type is based on a planned approach to business support based on the stimulation of close cooperation links between businesses, universities and government support agencies. The objective is to encourage the animation of the productive forces and exchanges between the scientific community and the business community, which will promote the progress and synergies. The interactive science parks are a model of innovation performance [2].

These strategic decisions to create a science park are generally based on two main objectives [3]. The first objective is to support the development and growth of new knowledge-based enterprises. The science parks promote their development and growth [4]. Science parks stimulate the development of innovative products and processes. They facilitate the knowledge transfer between university and businesses. These science parks are seen as an opportunity for businesses to shorten the time necessary to develop their innovations. The second objective of science parks is to act as catalysts for regional economic development. Based on the triple-helix model, the agglomeration of these businesses has the effect of stimulating interactions between businesses, government support organizations and academic actors [5]. Although the objectives of the science parks are documented in the literature, the understanding of businesses that have settled in a science park deserves to be studied more deeply.

II. Objective of the Study

The objective of this study is to improve the understanding of the expectations of businesses that chose to be established in a science park. In order to do so, it is important to first highlight their motivations to settle in a science park.

III. Methodology

Based on a constructivist approach, this research uses an exploratory methodology [6 and 7] to understand the expectations of businesses established in a science park. An interview grid was built and validated by four management experts. In addition, this research project received ethics approval by the Ethics Research Committee of the University of Québec at Rimouski. The sample was identified according to the sampling method of reasoned choice. This method allowed to identify good candidates not randomly, but rather based on judgment [6]. The team of researchers contacted up to four times, by email and phone, 130 executives of businesses and organizations located in seven science parks in the province of Québec, Canada (Cité de la biotechnologie agroalimentaire, vétérinaire et agroenvironnementale "Saint-Hyacinthe Technopole", Parc la Cité de la Biotech du "Développement économique Laval", Parc Micro Sciences de Trois-Rivières, Parc scientifique Bromont, Parc technologique du Québec métropolitain, Sherbrooke Innopol and Technoparc Montréal).

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Thus, twelve semi-structured interviews were conducted between September 2016 and April 2017: eight interviews with business managers, two interviews with government agencies and two interviews with academic actors in the science parks. The interviews were recorded in digital format. After being anonymized, their verbatim texts were transcribed from these recordings. The data were codified with the help of the Nvivo version 11 software. Finally, the content analysis of these interviews enabled to understand the importance of the motivations and expectations of businesses established in a science park.

IV. Results

The analysis of the interviews made it possible to reveal the businesses' motivations to settle in a science park as well as their expectations of the science park's contributions.

A. Motivations of businesses to settle in a science park

According to the literature, businesses benefit from innovating in an open innovation model. The establishment of businesses in a science park facilitates the rapprochement between the actors of the business community and the academic community. The geographical proximity of these actors makes it possible to share knowledge between them [8]. This proximity also increases the innovation capacity of businesses [9 and 10]. The agglomeration of these actors facilitates the common understanding of technical problems related to their processes [11]. The analysis of the interviews during this research project also revealed several other reasons why companies decided to settle in a science park: the availability of premises and equipment, the availability of skilled human resources, financial incentives, the reputation of the park, the geographical proximity with specific actors and the geographical positioning of the park.

1) Availability of premises and equipment

The availability of premises corresponding to the specific needs of the businesses (interviews #2 and #10) as well as the availability of specialized equipment (#8) represent important motivations for the respondents. These interviews concur with Lofsten and Lindelof [12] who argue that companies in a science park have more diversified resources than those that are not established in a science park. Several respondents (#5, #8 and #9) pointed out that they settled in a science park because they needed premises that were adapted to their specific needs in terms of equipment. These adapted premises facilitate their research and development activities.

"One of the incentives was the presence of specific laboratory equipment that was being offered and included in the rental lease agreement." Respondent #8 (translation).

2) Availability of skilled human resources

Moreover, being able to easily hire skilled human resources also motivates the establishment of a company in a science park (#3, #4, #6 and #9). Several entrepreneurs settled their business in a science park to get access to a pool of skilled human resources such as engineers, technicians or scientists. These results corroborate the work of Paul Krugman [13] in his book "Geography and Trade" which argues that the thick labor markets influence businesses to gather together.

"One of our motivations was the possibility of having access to competent human resources such as professors and trainee students." Respondent #9 (translation).

3) Financial incentives

Businesses established in a science park often have access to specific sources of funding, financial incentives or financial partners [12]. These financial incentives motivated many of the respondents (#1, #7, #8, #9 and #10). Monck et al. [14] point out that the main motivations for companies to settle in a science park were based on funding opportunities. These funding opportunities come from many sources: development agencies, local authorities, private sector research institutions, universities, premises and equipment at a lower cost, … The work of Paul Krugman [13] also corroborates these results. He argues that the financial costs associated with land and premises influence where businesses will be located. He also argues that businesses tend to be closer one from another to reduce these costs.

"The reason for our choice to settle in the technology park was mainly financial, that is to say the cost of rent." Respondent #1 (translation).

4) Reputation of the park

The reputation of the park is also one of the businesses' motivations to settle in a science park (#3 and #6). This reputation gives them a better image with partners such as clients and funders. Being established in a science park allowed them to demonstrate that companies have advanced knowledge or access to their knowledge despite often being SMEs with limited resources.

5) Geographical proximity with specific actors

The advantages of geographical proximity to other businesses and academic actors have led many respondents (#2, #3, #4, #5, #9 and #11) to settle in a science park. The geographic proximity of companies to research networks facilitates collaboration in R & D activities [15]. This proximity also provides learning support for businesses to innovate and to foster knowledge transfer [16]. Indeed, the presence of businesses, business partners, government support agencies and a pool of skilled workers creates an interesting synergy motivating companies to settle in a science park.

6) Geographical positioning of the park

Finally, the geographical positioning of the park is also businesses' motivation to settle in a science park (#10). Thus, the proximity of large companies (#6 and #7) and highways (#4) and even the facilities related to parking (#5) are sources of motivation for several companies to settle in a science park. These results corroborate Krugman's model [13]. His model

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explains that several centrifugal and centripetal forces influence the geographical agglomeration of businesses in a cluster.

In short, respondents pointed out six major motivations to settle in a science park. Once this decision is made, each of the companies has expectations of the science park's contributions.

B. Expectations of businesses established in a science park

One of the park's roles is to provide a set of win-win conditions in order to support businesses' development. Therefore, the expectations of companies established in a science park are varied #2, #3, #9, #10 and #11): to develop a network, to be accompanied, to have access to business people from foreign countries, to increase their credibility, to develop a competitive advantage, to improve recruitment and retention of skilled human resources, to access new knowledge, premises, equipment, facilities and financial benefits, to collaborate on strategic park planning, and to benefit from a business ecosystem that is conducive to innovation.

1) To develop a network

One of these companies' main expectations to settle in a science park is to be able to develop their network (#2, #3, #4, #5, #9, #10 and #11). The establishment in a science park makes it possible to develop a network between the companies, but also to link up with governmental support organizations and with academic actors (#1). This networking with external actors enables the company to share existing knowledge and acquire new knowledge. The proximity of companies in the same geographical area such as in a science park encourages access to new knowledge. This proximity through face-to-face contact between actors help to establish a climate of trust [17].

"The main advantage of the park is networking for me, we [the science park companies] are companies in the same industry who are experiencing the same problems and having the opportunity with the park authorities to share best practices. The sharing of knowledge from the proximity of government agencies is very beneficial." Respondent #3 (translation).

"In the area, the park acts as a networking agent, allowing us to push a project and bring it to maturity as quickly as possible." Respondent #11 (translation).

2) To be accompanied

When the companies are settled in a science park, they expect to be accompanied in legal and commercial terms as well as to have access to technical support. (#3 and #8). One of these respondents (#8) indicated that he expected to receive help related to intellectual property, which was not the case. Nevertheless, the second respondent (#3), from his point view, was well accompanied by the management of the science park.

"The park helped us solve problems." Respondent #3 (translation).

Some respondents (#2, #3 and #9) are very appreciative that the park management takes responsibility for facilitating networking activities within their park. These activities can take various forms: discussion tables, guest speakers, visits from foreign companies, networking events, ...

3) To have access to business people from foreign countries

Another expectation that came up in the interviews (#3, #5 and #6) is that the science park invite business people from foreign countries. These exchanges make it possible to have access to foreign customers and to have new contracts (#6). When companies exchange knowledge with geographically distant actors, these exchanges bring more novelty and encourage radical innovation [18]. These actors have been exposed to different knowledge, experiences and references, which creates new ideas [19].

4) To increase their credibility

The notoriety of the park is also important for businesses because it gives a lot of credibility to established businesses, which meets the expectations of two of the respondents (#3 and #5).

"The science park is so renowned that we receive Russians, Japanese and Europeans who are already familiar with the park, creating a trust relationship that is almost instantaneous." Respondent #3 (translation).

5) To develop a competitive advantage

Companies established in a science park are hoping to develop a competitive advantage by getting closer to business partners (#3, #8 and #11). These partners can even provide them with financial support.

"We are at a stage where the park could help us support some of the funding activities." Respondent #8 (translation).

6) To improve recruitment and retention of human resources

Other respondents (#2, #6 and #7) wanted to improve the recruitment and retention of staff by settling in a science park. The fact of being settled in a park makes it possible to reach a critical mass of companies, which increases the attraction of qualified human resources [6].

"Being able to find talent and skills in the park really helps us, and the park plays a magnet role." Respondent #5 (translation).

7) To access new knowledge

Having access to training and knowledge through the presence of researchers, universities and government agencies in science parks is also one of the expectations of companies (#2, #3, #5, #6 and #9). Indeed, several universities and research groups are closely associated with the science parks. This proximity is one of the most decisive factors in increasing companies' innovation capacity [5]. The presence of universities offers an interesting labor pool (#5) and also allows for the creation of new ideas

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(#10). A great deal of informal learning occurs in places such as science parks where individuals interact daily [20]. When these people meet in common spaces, they discuss and exchange ideas and sometimes even solutions to common problems. Companies have "the possibility with the park authorities to share best practices." Respondent #3 (translation).

8) To access equipment and premises

Several respondents (#1, #2, #3, #5, #7, #8 and #10) expected to have equipment and facilities. Among the equipment, it should be noted that a respondent (#1) expected to have access to the Internet from the science park. Another respondent (#5) was more or less satisfied because the park could not provide specialized space for his needs. Nevertheless, several respondents (#2, #3, #7, #8 and #10) were satisfied with the access to this equipment.

"The park has helped us solve problems. It [the park] puts us in touch and helps us find equipment that allows us to really progress." Respondent #3 (translation).

9) To access financial benefits

Access to a range of administrative facilities and financial benefits as well as rental reductions are important expectations for companies established in science parks (#2, #5, #8 and #11). Companies' expectation of their access to financial benefits is further corroborated in the literature [12].

10) To collaborate on the park's strategic planning

In addition, some respondents (#5, #7 and #10) wanted to collaborate on the park's strategic planning and executive committee. These collaborations offer the opportunity to present their needs and expectations in order to participate in structuring projects for the park.

11) To benefit from an ecosystem that is conducive to innovation

Finally, many respondents (#1, #2, #3, #4, #5, #7, #8, #9 and #10) indicated that by settling in a science park, they expected to benefit from an environment conducive to innovation due to the particular business ecosystem created by the science park.

"It's not the financial or fiscal incentives offered by the park, but this integration with the ecosystem that allows us to develop an innovative business model and take advantage of a range of incentives that can be applied to our partners. […] It is the diversity of these points of view and the ensuing discussions that generate new ideas." Respondent #10 (translation).

In short, the analysis of the interviews revealed six motivations for companies to settle their business in a science park and eleven distinct expectations of companies established in a science park.

V. Limits and Future Research

Although this research is not intended to generalize the results, this study focuses on companies in the science parks of the province of Quebec, Canada. It would be relevant to study the similarities and differences with other regions and countries. In addition, the park managers' point of view would also be interesting to analyze in future research. Finally, a confirmatory study would validate the exploratory results of this research.

VI. Conclusion

This research has allowed a better understanding of the businesses that have settled in a science park and will enable park managers to make better decisions. Based on the research results, they will be able to have a better understanding of the incentives to set up to attract new businesses. Science park managers will also be able to provide the science park's businesses with better support in their development.

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