

Development of Start-up Companies: Empirical Study of Key Determinants

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Abstract: Startup, or start-up, is a business entity, typically described as a newly established company, which is based on an innovative business concept using advanced technologies and is rapidly evolving. Start-up has large potential for economic growth. These firms are often funded by their business founders and venture capitalists. Due to high costs or limited revenues, a huge number of these small companies are not able to be maintained at a certain rate or level in the long term without additional funding by venture funds, business angel or private or public sector. Start-up companies cooperate in networks where they use access to supply of money, materials, staff, and other assets that can be drawn on by a person or organization in order to function effectively through different sort of stakeholders and key actors. It seems not clear to understand all particular issue and entities which these companies should concentrate their networking endeavour on, especially in correlation of variable of inputs is important to describe and see the connotation how the regional innovation strategy influences survival at their early stage. The article analyses a unique sample of 30 Czech start-up companies established between 2010 and 2020. The results show that the survival of a start-up company depends on three main part of network of actors: investors, external entrepreneurs, entrepreneur in residence and an influence of innovation centre (or science parks). In addition, start-ups that were raised in the region with a regional innovation strategy summarize the objectives, problem areas and priorities that will be required to deliver regional development policy, including business growth and innovation and have shown a greater likelihood of survival.

Keywords: start-up; survival of start-up; regional strategy; transfer technology; governmental support

JEL Classification: X03; X04

1. Introduction

There is increasing share that start-ups entities are one of the strategical pillars of economic progression (Vincett 2010) with not only economic but also societal implications. Regional strategies to increase the effectiveness of the procedure of setting more start-up companies in a particular region (Fini et al. 2017; Lockett and Wright 2005; Miranda et al. 2018; Mustar 1997). These firms are often initially funded through business founders as they attempt to capitalize on developing the level of product or service where high demand is expected. Consequently, in the long term these entities are not sustainable without further support by the venture capitalist. In the last decades of last century, the most ordinary type of start-up was the internet online application. At this time, venture capital was very easily obtainable among start-ups that speculated about the creation of these new businesses. Unfortunately, most of these start-ups that were focused on the Internet application it disappeared only because of the high oversight of its basic business plans, such as the lack of sustainable income. There are therefore several Internet businesses that have not survived the burst of the Internet business bubble. Examples of companies include Amazon.com, an online retailer, and the eBay online auction portal. Other names of a successful businesses that came later are Facebook, Ant Financial, Airbnb, Uber. A start-up requires a clear business plan, an outlining mission statement, future visions, and a target as well as marketing and management strategies. Scientifically work have focused on describing the later stages of start-up, mostly post-start-up development (Iacobucci and Micozzi 2015; Visintin and Pittin, 2014). And the success was expected as potential sustainability. Other studies that

determine success as a progression through critical connection (Hayter 2016a) who are trying to get a chance to win successful businesses.

Other studies are focused on the industrial organization and the survival of the operational existence or persistence of a company at a time that it allows to understand the factors leading to its success and sustainability. Company survival is considered to be a complexion assessment of firm's performance efficiency (Jovanovic 1982) or larger productivity (Klepper and Simons 2000). However, in literature only a small group of start-ups has been described in terms of their development and few studies have been devoted to describing and generalizing key determinants so far. There are some factors which have been influencing the star-ups grow and that factors are mainly connecting with networks of stakeholders that support them in their early stage. (Hayter 2016b; Rasmussen et al. 2015). The literature on star-ups mostly describes 4 types playing crucial roles in their lifecycle: experienced entrepreneurs, investors, a business incubator in combination with innovation policy – governmental stakeholder. While much of the attention of these key players are mostly focused on to the first phase of a star-ups life time. Is very important as it makes it hard to set up policy tools, at different levels, there must be different tools set up on local, regional and national levels, which will be supporting start-ups and ensure to return public investment.

There are four key obstacles that can determinate company's success. These are the responsibility of newness, the responsibility of growing up the responsibility of senescence and the responsibility of development slowdown. The responsibility of innovation lead to that young companies have higher probabilities to fail, as they have not had enough time to develop their resources and external sources and legitimacy (Bower 2003). The factor can be observed in Borghesi's study (Borghesi et al. 2007) describing that " from studies on diversification strategies typically employed by older firms. In opposite site, the responsibility of adolescence affirm that firms experience a 'honeymoon effect' (Hudson 1987) in their first years of being on market, due to sunk costs, which leads to higher survival rates in the early years, and an increase in failure in the next years. Over time, firms develop their human resource, processes, product, technology and become unwilling to change when the state of affairs in the industry has change to competition-type challenges." This leads to a deprivation of the market or productivity disadvantage and could increase risk of failure. Jelfs (2016) and Lawton Smith et al. (2014) described the fact that UK start up experienced limited failure rates in their first three years only increasing afterwards, because start up wet through adolescence and responsibility. Star-ups benefit from management and the commercial skills (Wennberg et al. 2011) of their external entrepreneurs. Criaco (2014) claimed that star-ups whose headquarters had economical and business experience shown higher survival potential. Transitions in the business life cycle tend to affect many aspects of the business innovation system. A holistic and systemic analytical frame is provided with the "business innovation model". This model distinguishes between the business innovation value drivers and the critical resources related to them. A mutual understanding of star-ups and SMEs business innovation dynamics is a prerequisite for collaboration and sharing between stakeholders.

2. Methodology

The aim of the research was to analyze the innovative start up ecosystem in one of the fastest high-tech and economical grow regions within the Czech Republic, including the socio-economic factors that influence it. In addition, an effort was made to describe the behavior of star-ups in the field of innovation implementation and transfer technology to follow factors such as the survive of company after three years, export rate, survival firm, increasing of turnover, venture capital, cooperation with innovation participate in innovation strategy of region, cooperation with entrepreneur in residence participating in accelerator program.

The aim of this paper is to give the answer to following research questions:

1. Who are the key stakeholder and network entities that determine the survival star-ups?
2. How are regional economic development conditions related to star-ups survival?

To answer these questions, a sample of star-ups companies formed between 2010 and 2020 is examined in terms of their survival.

- Hypothesis 1. There is positive relationship between the survival of start-up companies and the number of investors holding equity stakes in these startups.
- Hypothesis 2. Coherence between the involving of entrepreneurs in residence has positive impact on survival of startups.
- Hypothesis 3. There is relationship between access to business innovation parks and start-ups survival.
- Hypothesis 4. Innovation strategy of region supporting startups has positive impact on start-ups survival.

2.1. Description of data source

In the work was applied a combination of qualitative and quantitative research method and the mutual penetration of these two approaches. In the simplified model of the three phases of such mixed research, the sample structure is as follows: determination of research questions, secondly data collection and thirdly data analysis. The basis of the research activity for the work was a structured background for interviews, not a questionnaire, but a sophisticated interview, which had to be properly prepared in advance, to study the documents for each company, for example from the annual reports of companies. There were involved 30 startups. An interview could only be carried out with the company owner. In both cases, the most important criterion was that the manager/owner is responsible of the company's innovation strategy and is holder of transfer technology strategy in company. For the selection of startups companies, three main criteria have been identified, which are described below. This was a multi-criteria selection. The first criterion was the company's age, interest in start-ups programs, interest in intellectual property issue.

2.2. Description of region

The South Moravian region has a traditionally strong and expanding base in the research and development area of higher education students and scientists and industry. It is currently one of the most economically growing regions of the Czech Republic and one of the most dynamic regions in Central Europe. According to the extent of R&D capacity, the South Moravian Region has the most suitable conditions for the development of the knowledge economy. The Regional Innovation Strategy of the South Moravian Region is a long-term vision and implementation plan which enhance the competitiveness of the whole of South Moravia Region. Since 2001, Regional Innovation Strategy brings together scientists, universities and research centers, owners of technology companies, people from local government and the active public. The purpose of Regional Innovation Strategy is to create conditions for competitive knowledge-intensive business, setting start-ups particular by investing in improving the quality of education, research, improving the smart region image and directly supporting business activities where market failures occur (e.g. support for start-ups or support for knowledge intensive) activities in mature companies.

2.3. Software used

There was selected IBM's software, named IBM SPSS Statistics. This software provides tools for the statistical analytical process, including reports and outputs important and useful not only for statistics but also for company management and their employees, and can also serve municipalities in decision-making on strategic regional development. The name of this software was derived from the Statistical Package for Social Sciences (SPSS) as a statistical package for social sciences.

2.4. Statistical methods

Data was processed and analyzed using the following methods. A correlation analysis illustrates the statistical dependence of two quantitative variables and measures the mutual relationship of two variables. Variables are in correlating if particular values of one variable tend to appear together with particular values of the second variable. The aim of the correlation analysis is to determine the linear dependence between the variables. The first idea of the dependence of the characters X and Y can be

obtained by observing these characters in statistical units and showing the data with a point diagram. It is a diagram in which each pair of observations (x_i , y_i) is represented as a point in a rectangular coordinate system where a scale of the x and a vertical scale of the y values are located on the horizontal axis. The points drawn are then a set from which to trace the characteristic features of both characters. The correlation shows the statistical dependence of two quantitative variables (it measures the mutual relationship of two variables). The original data source is .xls files and contains numeric variables. Which were imported into IBM SPSS Statistics software.

2.5. Data file variables

The following variables were tracked: factors such as the survive of company after three years, export rate, survival firm, increasing of turnover, venture capital, cooperation with innovation participate in innovation strategy of region, cooperation with entrepreneur in residence participating in accelerator program.

3. Results

The fact that the number of investors is positively related to start-up survival (Hypothesis 1) confirms a wide range of literature commend the position of venture capitals (Fini et al. 2017) but also public funds, business angels (Mosey and Wright 2007) and seed capital. Clearly, start-up challenging to survive without external capital to maintain and accelerate their development. Although the engagement of an external entrepreneur in a start-up has been widely discussed (Hayter 2013a), limited empirical experience links the role of external entrepreneurs to start-up performance (Visintin and Pittino 2014). It is obvious that these stakeholders are also very important for startup's survival (hypothesis 2). It offers "an important role for these experienced entrepreneurs' business and management skills and developed networks".

Moreover, entrepreneurs in residence could also play the role as a facilitator of investment-driven growth (Vohora et al. 2004). Literature describe the role played by investors, primarily in the form of the private venture capital, business angels, venture funding, public funds (Huggins 2008), or the role can play also industry of venture capital (Bonardo et al. 2011). These actors contribute vital resources that add to the development of a start-up company and ensure its growth. The receipt of investment not only influences a start-up s growth, but also signals its credibility (Vohora et al. 2004), quality (Fini et al. 2017) and entrepreneurial orientation.

Innovation parks are very important for start-up formation and widely discussed as one of important entities of governmental support the start-ups (M'Chirgui et al. 2018). Innovation parks offer a lot of support services as IPR consulting, law services, coaching, mentoring, administration, facilities, consulting and potential of investment, connecting to venture investor, and in some cases also management support. They offer accelerator programs where experienced mentors are involved, successful businessman and financial professionals help to support start-ups in their first stage of development. Innovation parks accelerate business development and reduce the probability of failing caused of isolation from immediate market. According the research there were occur significant correlation between the survival of company and the combination of venture capital and entrepreneur of residence, because more that investment itself is important the knowledge of market, knowledge of management processes and relevant business contacts, which brings entrepreneurs in residence. Also, there were significant correlation between the survive of company and their participating in some of activating carrying by innovation strategy. All hypothesis which were set in the research objective in the article were proven by empirical study and proven by statistical methods. The particular correlations are visible in table 1. There is significant correlation between the survival and entrepreneur in residence involvement in start-up in its early stage. It supports the hypothesis that not only venture capital but mostly the additional entrepreneur experience is important for start up to cross the "death valley".

Table 1. Correlation of individual variables.

		Survival firm	Increasing of turn over	Venture capital	Cooperation with innovation park	Participate in region with innovation strategy	Entrepreneur in residence	Participation on accelerator program
Survival firm	Pearson Correlation	1	,807**	,130	,326	,246	,603**	-,073
	Sig. (2-tailed)		,000	,486	,073	,183	,000	,698
	N	31	31	31	31	31	31	31
Increasing of turn over	Pearson Correlation	,807**	1	,080	,551**	,143	,659**	-,141
	Sig. (2-tailed)	,000		,670	,001	,444	,000	,450
	N	31	31	31	31	31	31	31
Venture capital	Pearson Correlation	,130	,080	1	-,036	-,015	-,139	,273
	Sig. (2-tailed)	,486	,670		,849	,938	,457	,138
	N	31	31	31	31	31	31	31
Cooperation with innovation park	Pearson Correlation	,326	,551**	-,036	1	,025	,599**	-,190
	Sig. (2-tailed)	,073	,001	,849		,894	,000	,307
	N	31	31	31	31	31	31	31
Participate in region with innovation strategy	Pearson Correlation	,246	,143	-,015	,025	1	-,053	,352
	Sig. (2-tailed)	,183	,444	,938	,894		,777	,052
	N	31	31	31	31	31	31	31
Entrepreneur in residence	Pearson Correlation	,603**	,659**	-,139	,599**	-,053	1	-,338
	Sig. (2-tailed)	,000	,000	,457	,000	,777		,063
	N	31	31	31	31	31	31	31
Participation on accelerator program	Pearson Correlation	-,073	-,141	,273	-,190	,352	-,338	1
	Sig. (2-tailed)	,698	,450	,138	,307	,052	,063	
	N	31	31	31	31	31	31	31

** . Correlation is significant at the 0.01 level (2-tailed).

5. Conclusions

Factors influencing the degree of innovation and start-ups growing and thereby increasing their added value on the market are several and have a different character. The presented research shows that there are different linkages and correlations between the different factors. Precisely mapping and analyzing can be one of the guides to effectively set up innovation policy and to choose the appropriate instruments to support setting start-ups on regional base level and support innovation policy at regional and national level as well. As it has been already emerged from the research for the future innovation capacity of the Czech Republic, it is important that it significantly boosts the segment of companies that decide autonomously on their overall strategy and strategic innovation. This study was focused on venture networks and regional innovation strategy and the role of innovation parks in correlation to start-up survival. It shows that connections a multi-stakeholders-actor network have strategic key role for the start-up and also the paper describes main findings which are firstly that the number of investors is has positive impact on the probability of start-up survival. Secondly, the involving of an entrepreneur in residence who has the experience with running similar business with the similar business model is crucial to a start-up growth. Predicting. Thorough a set of business knowledge, business skills and networks than a technology orientation. Regional innovation strategy and industrial structure of particular region is important for understanding survival of start-up.

Survival in early stage of business entities cannot be isolated from the integrity of regional economic environment. It seems that higher survival potential is in regions following innovation strategy and that investors and entrepreneurs in residence who have the potentially positive external outsourcing may increase purchasing networks and improve network structure that build economic complex context for start-up support.

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