Analysis of Innovative Start-Up Companies – Case of Košice Region

Peter Džupka, Slávka Klasová, Viliam Kováč

ABSTRACT

Purpose: Support policy for start-up companies is being developed nowadays in Slovakia, but so far there has hardly been any research focuses on this issue. Therefore, the aim of this article is to identify, what are the specific needs and funding sources of start-up companies according to their stage of development.

Methodology/Approach: This paper used questionnaire empirical approach. The research was conducted in the Košice region. The sample of 47 innovative start-up companies was obtained and analysed using statistical measurements such as the Pearson's chi-square test and the correspondence analysis method.

Findings: The results reveal that start-up companies at their initial phase of development mostly use bank loans as a funding source of their activities, but they opt also business angel as their source of funding at start phase of development. The findings further discover relation between the stage of the development of start-up company and its specific need. Additionally, research probes that collaboration with other firms or universities has a positive impact on prosperity of the start-up company in terms of higher profitability and better access to funding.

Research limitation/Implication: The Košice region is not an area, where representative survey in the field of start-up companies can be held nowadays. It relates to small market of innovative and creative solutions and goes with not so developed incentives to support start-up companies in their initial phase of development too. Thus, all the results and the outcomes coming from the dataset can be considered rather demonstrational than complex.

Originality/Value of paper: We show the specific needs and funding sources for start-up companies in the Košice region according to their stage of development and thus identify, which aspects government representatives should pay attention to and what should be taken into consideration when designing

policy initiatives oriented towards support of start-up prosperity. Furthermore, we bridge the gap between increased attention to analysis of start-up companies and no effort made to analyse them in the Košice region.

Category: research paper.

Keywords: start-up; innovation; support policy; prosperity.

1   INTRODUCTION

It has been acknowledged that start-up companies have essential role as a driver of technological and economic growth of any country. Those companies create a favourable environment and by introducing new products or services they can substantially contribute to a country's competitiveness (Mazanai and Fatoki, 2012). Additionally, as they tend to be more labour intensive they can boost employment more effectively than large firms. From this point of view government intervention for subsidies to promote start-up and spin-off prosperity is needed in order to create such employment (Alweendo, 2004). As the rationale for public support for companies is confirmed by several research, countries have started to establish a range of programmes for supporting start-up scene. Local start-up scene is growing also in the Košice region. The first official centre for supporting start-up projects Eastcubator was founded in 2012 and thenceforward several start-up activities have been created. For instance, the Technical University of Košice, the second largest technical university in Slovakia, opened its Startup Center for the first batch of young innovative start-up companies (City of Košice, 2015). By the end of 2014, two incubators were founded in Košice – one of them was established at the Technical University of Košice and the other one was founded as a result of the commercial activity of the AZU project members (Lavčák and Hudec, 2015). Following the efforts and cooperation of various institutions, companies and individuals, the Košice region is on a great path towards becoming a regional heart of innovative start-up. In spite of that local ecosystem is very dynamic and keeps changing, it is growing only slowly. This development is the consequence of some reasons. For instance, definition of start-up companies is often confused, although they are mentioned in strategic development documents (Džupka and Vajda, 2015). Secondly, there is a lack of cooperation and coordination between the various existing initiatives and companies specific required needs.

Muller and Rammer (2012) present some proposals for this situation. First of all, when government focuses on creation of a policy to promote new start-up companies, it is first and essential to classify the different types of start-up companies and their stage of development. Further, it is important to examine their special needs according to their stage of development (Muller and Rammer, 2012). Support measures cannot be equal for each start-up companies as they have different needs and require different support according to their stage of development. As our research reveals, while in the initial phase of their

development they seek marketing and mentoring services, at the start phase they need help in finding potential new customers and at the growth phase they look for access to incubators or accelerators. Another research carried out by Cvijanović, Marović and Sruk (2008) and Čalopa, Horvat and Lalić (2014) pointed out that financing of the start-up companies also depends on the phase of development. Therefore, in this paper we focus on the financial source of start-up companies while taking into account their stage of development. Our research reveals that bank loans are important formal financial sources for many start-up companies at their initial and start phase of development. However, business angels are used as a main source of funding of start-up companies at their start and risk capital at their growth phase of development.

The rest of the paper is organised as follows. The next section presents some literature background on start-up companies. Section 3 and Section 4 present data and methodological approach used in this study. Section 5 reports the obtained results and conclusion with highlights opportunities to improve and to broaden this research.

2   THEORETICAL OVERVIEW

There is no single formal definition on start-up companies in the current literature. Saini and Plowman (2007) describe start-up companies as small companies, most often with a high-tech focus and in an early stage of development creating a product or service. In terms of company size, start-up companies represent a segment of small and medium-sized companies (Saini and Plowman, 2007). In our research of 47 start-up companies, each company had no more than 15 employees and thus can be classified as a small company according to the European Commission standards (European Commission, 2015). Another definition comes from Blank and Dorf (2012), who describe start-up company as a temporary organisation in search of a scalable, repeatable and profitable business model (Blank and Dorf, 2012). While for Bürgel (1998) start-up company is legally independent company not older than ten years operating in one or more high-tech sectors. The oldest start-up company in our research is six years old company. Concerning the high-tech issue Chorev and Anderson (2008) proposed definition of high-tech start-up company. According to them, high-tech start-up company is heavily dependent upon innovation in science and technology.

2.1   Funding sources of start-up companies

Finding investment sources to set up or to expand a start-up is a big obstacle faced by many entrepreneurs. Usually start-up project founders do not have their own financial resources and therefore need external investments. There are several traditional funding sources such as subsidised bank loan, business angel, risk capital and structural fund that can be used.

Subsidised bank loan represents a loan, which borrower pays no interest for. In other words, interest rate reaches a zero level at all or it is paid by the third party, who subsidises borrowing business.

Company supported by business angel is a very common case in field of financing newly founded start-up firms. Business angels are investors who help start-up companies to realize their business ideas. Additionally, business angels help by sharing their know-how, experience and financial resources which is the additional option for survival of the companies (Čalopa, Horvat and Lalić, 2014).

Risk capital investments can come from individuals, companies or funds that invest in individual companies in order to help their development. Risk capital is not affected by company´s cash flow.

Structural fund denotes a kind of financial funding coming from the institutions of the European Union. These structural funds are aimed at development of the particular sectors of the national economics in the certain regions. They focus on aid to the member states to raise entrepreneurship not only in the manufacturing sector but also in the service sector.

2.2   Phase of development of start-up companies

Start-up companies during their life cycle go through different stages of development. As argued by Maurya (2012), one can distinguish three main different stages.

The first stage is the initial phase which investigates whether the market has a problem that needs to be solved. In that phase the founding start-up team is formed and a business plan is created. During this phase innovative start-ups tend to require eminent amount of investment thus, training programmes, legal and management advice offered free of charge or through low-cost consulting services can be very helpful for them (Muller and Rammer, 2012).

It is also claimed that financing of start-up companies depends on the phase of development (Cvijanović, Marović and Sruk, 2008; Čalopa, Horvat and Lalić, 2014). In the initial phase companies mainly use subsidised bank loans, business angels, and venture capital funds. A large number of researches claim that finding investment sources at the initial phase is a obstacle faced by many start-up companies. Since start-ups are mostly set up by young people, who do not own property in many cases, it is difficult to demonstrate advance proof of innovative competence and economic performance (Lejpras, 2012), so bank or investors cannot accurately assess the potentiality of them (Leland and Pyle, 1977). Moreover, many start-up companies hesitate to reveal detailed information about the project as they have a fear of disclosure to potential rivals. In summary, if the market is not sufficiently developed to serve the financing needs of innovative start-ups, funding programmes, such as grant, guarantees and loan, are inevitable.

At the second stage, the focus is on developing the product and the start-up is essentially a product development team (Kazanjian, 1988). The company incorporates and raises seed capital. This stage is frequently named as start stage in the entrepreneurship literature.

The third phase involves the expansion and growth of start-up companies, which leads to higher number of employees and market shares or to higher income. Company makes the transition from start-up to real business. In this stage the product takes off and the start-up makes transition into a formal company as organisational structure begins to form (Skuladotir, 2013). In the expansion phase, the most common sources of funds are venture capital funds and loan funds (Čalopa, Horvat and Lalić, 2014). In this stage of development it is indeed important to increase awareness of innovative start-up business among the general population and to create a positive entrepreneurial climate. Giving awards to start-ups that have successfully established innovative business models or introduced innovative products can be a useful tool for this.

In this paper we provide information on how the funding sources and specific needs vary according to the stage of development by testing two hypotheses.

Hypothesis 1*: there is a statistically significant relationship between the stage of development and funding source used by start-up companies.*

Hypothesis 2*: there is a statistically significant relationship between the stage of development and specific demanded and availed services.*

2.3   Start-up companies and collaboration activities

Collaboration activities are sources of additional or complementary knowledge and know-how that are not available within the firm (George, Zahra and Wood, 2002). Moreover, collaboration helps in overcoming the legitimacy problem (Lejpras, 2012) and in better innovation performance (Spišáková, 2010). Especially for young start-up companies it is difficult to prove advance proof of innovative competence and economic performance. Therefore, links with partners (university or firms) may provide the firm with a reputation by association for reliability and quality (Gübeli and Doloreux, 2005) and enable access to the finance resources. Additionally, collaboration activities and networking may have significantly impact on decreasing a firm's costs. These cost reductions and innovation outputs can result in competitive advantage and improved financial performance (Grant 1998; Lerner 1994; Liebeskind, et al. 1996). Thus, we proposed following hypothesis:

Hypothesis 3*: collaboration activities enhance start-up profitability and access to finance sources.*

3   DATA

The primary research was conducted through questionnaire survey administered to selected 47 start-up companies located in the Košice region. The research questionnaire have 16 questions divided into three main areas. The first area with the title Main characteristics of start-ups contain the questions about their clients, collaboration activities and their stage of development. The second area focus on economic condition and competition. This area address demanded and used services for start-up companies at the different stage of development. The last part deal with the questions about their investment, research and development activities. This part helps to define the source of their financing at the stage of development and thus, to specify an expectation. To statistically visualise the gathered data and to establish the basic characteristics of the sample, correspondence analysis and chi-square tests are applied. Correspondence analysis is a statistical technique constructed to visually express relations involved in the dataset. This set of methods manages to handle both quantitative and qualitative data. Obvious way of an input is a contingency table. Standard form of an outcome is diagram or similarity table. There are several superstructures built upon correspondence analysis with their specific purposes – for instance multiple correspondence analysis, detrended correspondence analysis and canonical correspondence analysis.

4   METHODOLOGY

To analyse relation between the development phase of the particular start-up company and its source of funding, we compute phase profile and funding profile for each type of these dimensions. Profile calculation expresses a share of a certain case of the dimension of the total number of all the instances of the dimension. Development phase profile is quantified in this way:

$$PP_{p;f} = \frac{P_{p;f}}{\sum_{p=1}^{m} P_{p;f}}$$

- $PP_{p;\,f}$ – phase profile of the p development phase according to the f funding source;
- p – development phase;
- f – funding source;
- $P_{p;\,f}$ – a number of start-up companies positioned in the p development phase and financed by the f funding source;
- m – a number of development phases.

Calculation of funding profile is based on the following formula:

$$FP_{p;f} = \frac{F_{p;f}}{\sum_{f=1}^{n} F_{p;f}}$$

- $FP_{p;\,f}$ – funding profile of the f funding source according to the p development phase;
- p – development phase;
- f – funding source;
- $F_{p;\,f}$ – a number of start-up companies financed by the f funding source and positioned in the p development phase;
- n – a number of funding sources.

To measure differences between the development phases and the funding sources themselves we calculated chi-squared distance (Yelland, 2010). Chi-squared distance is quantified for development phase profile in a following way:

$$D_{p_1;p_2} = \frac{PP_{p_1;f} - PP_{p_2;f}}{APP_p}$$

- $D_{p_1;\,p_2}$ – chi-squared distance between the p_1 development phase and the p_2 development phase;
- p_1, p_2 – development phases;
- f – funding source;
- $PP_{p_1;\,f}$ – phase profile of the p_1 development phase according to the f funding source;
- $PP_{p_2;\,f}$ – phase profile of the p_2 development phase according to the f funding source;
- APP_p – average phase profile of the p development phase according to the f funding source.

For funding profile it is done as follows:

$$D_{f_1;f_2} = \frac{FP_{p;f_1} - FP_{p;f_2}}{AFP_f}$$

- $D_{f_1;\,f_2}$ – chi-squared distance between the f_1 funding source the f_2 funding source;
- p, – development phase;
- f_1, f_2 – funding sources;
- $FP_{p;\,f_1}$ – funding profile of the p development phase according to the f_1 funding source;
- $FP_{p;\,f_2}$ – phase profile of the p development phase according to the f_2 funding source;

- AFP$_f$ – average funding profile of the f funding source according to the p development phase.

5   EMPRIRICAL RESEARCH RESULTS

The aim of conducted research was to identify the stage of development of start-up companies, their financing methods, collaboration activities and their used and demanded services. By applying correspondence analysis, specific characteristics of start- up companies were perceived. The results of the research showed that 36 % of start-up companies are just at the initial phase in which their business plan is completed and now they are searching for potential source of finance, 39 % start-up companies are in the stage of start phase and 25 % companies are at the growth phase where the emphasis is put on higher sales of their products or services.

5.1   Analysis of funding sources

Researching the source of funding has shown that the most similar funding sources are subsidised bank loan and business angel, which correspondence is given by chi-squared distance of only 0.088 as seen in the Table 1. This situation is confirmed by the fact that these two funding sources were important at the start phase of development. Additionally, almost all start-up companies at their initial used subsidised bank loans. The second most similar relation lies between a pair of business angel and structural funds with chi-squared distance at level of 0.142. This similarity is based on the fact, that these sources of funding were rarely used by companies at their initial phase of development, but mostly by companies at their start phase of development. Results are thus not in correspondence with theoretical expectations that business angel will be mainly used at the initial phase. The Business Angels Network was established in 2011, hence Slovakia was the penultimate country of the entire European Union to have such a network. In Slovakia the Business Angels Network (SBAN) was established in 2011, and Slovakia was the penultimate country of the EU 27 to have such a network. It seems that there is a lower reputation and awareness of Business angel Networks amongst start-up companies at their initial phase. According to several additional interviews with start-up companies the explanation of this finding can be in found in two issues. The first is the cultural problem – Slovakia start-up entrepreneurs usually have small propensity to swap equity for external funding. The second issue is that the risk capital in Slovakia usually offers fewer funds for higher equity than in western countries. The start-up companies' considers this rate as disadvantageous.

The mostly different funding sources are subsidised bank loan and risk capital. Their mutual chi-squared distance reaches value of 0.726. This seems relatively clear in light of the fact that risk capital is obviously offered in case when no financial institution is willing to support initiation of start-up company. Usually

those companies try to introduce a new technology and it is unclear if there is a market for this. Because of that high uncertainty and lack of collateral there is lower chance to get finance from banks. Risk capital was therefore mainly used by companies at their growth phase of development.

Table 1 – Similarity of funding sources

Funding	Subsidised bank loan	Structural funds	Business angel	Risk capital
Subsidised bank loan	0	0.384	0.088	0.726
Structural funds	0.384	0	0.142	0.366
Business angel	0.088	0.142	0	0.409
Risk capital	0.726	0.366	0.409	0

Source: compiled as own elaboration by authors

To sum up, it can be stated that differentiation of the funding sources according to position in the particular development phase is considerably visible. Above mentioned statement can be formulated into the two following hypotheses:

- H_0: *there is no statistically significant relationship between the stage of development and funding source used by start-up companies.*

- H_1: *there is statistically significant relationship between the stage of development and funding source used by start-up companies.*

We have applied standardised Pearson's residuals to investigate, which of these hypotheses is statistically true. The Pearson's chi-square test statistics reaches a value of 10.7838 at 42 degrees of freedom. Its p-value stands at 0.0014. Therefore, we reject the zero hypothesis H_0 and we claim that there is statistically significant relationship between the stage of development and funding source used by start-up companies. Altough the fact, that funding tools are in Košice used in different ways than in western countries, must be highlighted here.

5.2 Analysis of collaboration activities

In the next part of the analysis we consider whether the collaboration activities enhance start-up profitability and access to potential finance sources. Start-up companies were therefore asked to evaluate their level of profitability and access to finance. All these indicators were evaluated by scale from 1 to 10, where 1 means the lowest value of the indicator and 10 expresses the highest value of the indicator. The following diagrams visualise residual values of the explored data. Residual represents difference between the observed value of the indicator and the estimated value of the same indicator. In this way it can be examined, in which situation the observed indicator has higher or lower value than it would reach in a case of uniform distribution. Blue coloured shape describes the

situation when the indicator rises to higher value than it is expected, whilst grey coloured shape expresses a situation with lower value or neutral zone that demonstrates a case with approximately expected value.
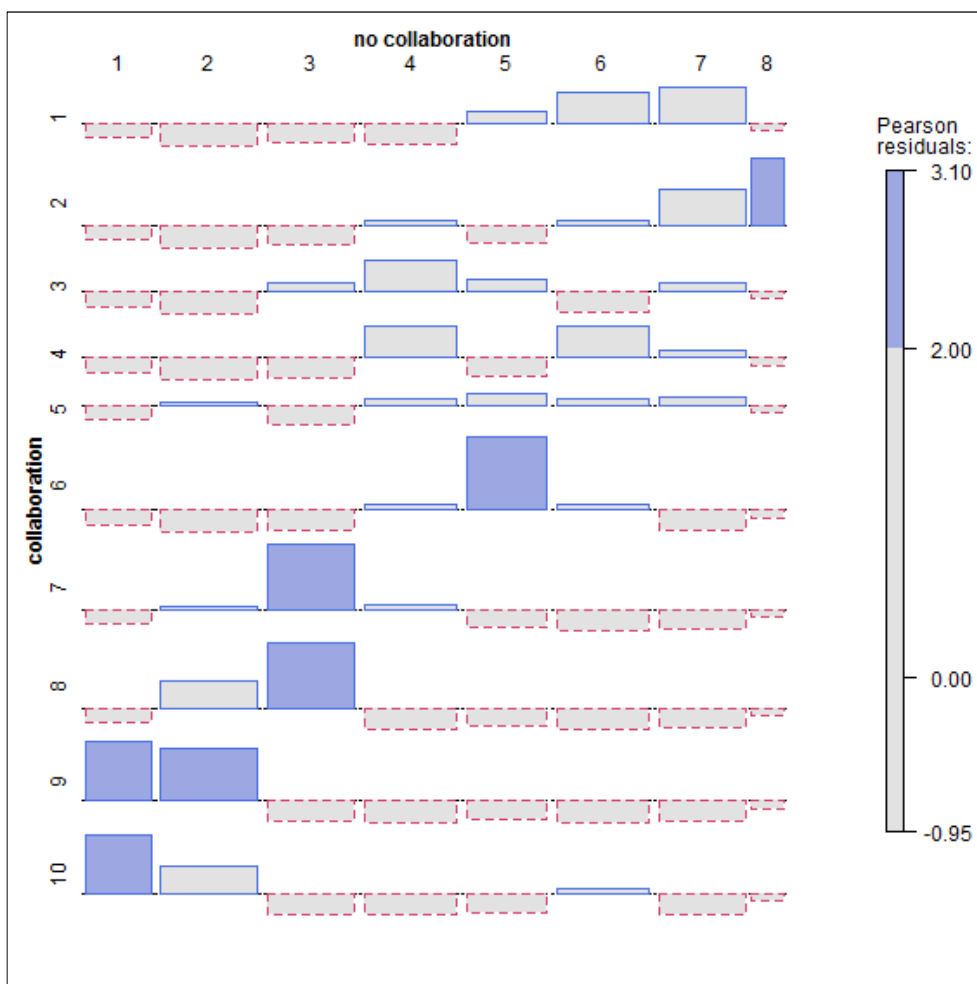

Figure 1 – Evaluation of profitability of start-up companies according to collaboration

The Figure 1 demonstrates how profitability of start-up companies change according to state of their collaboration. The highest profitability is reached by start-up companies, which collaborate with other organisations (firms or universities). It is caused by the fact that commercial partners may help start-up companies in cost reduction as cooperative research and development undertaking is lower than those of individual research and development. Further, the findings show that none of the start-up companies assign values 9 or 10 to their profitability in no collaboration state. On the other hand, there are several

start-up companies that assign the two highest marks to their profitability and at the same time had collaboration state.
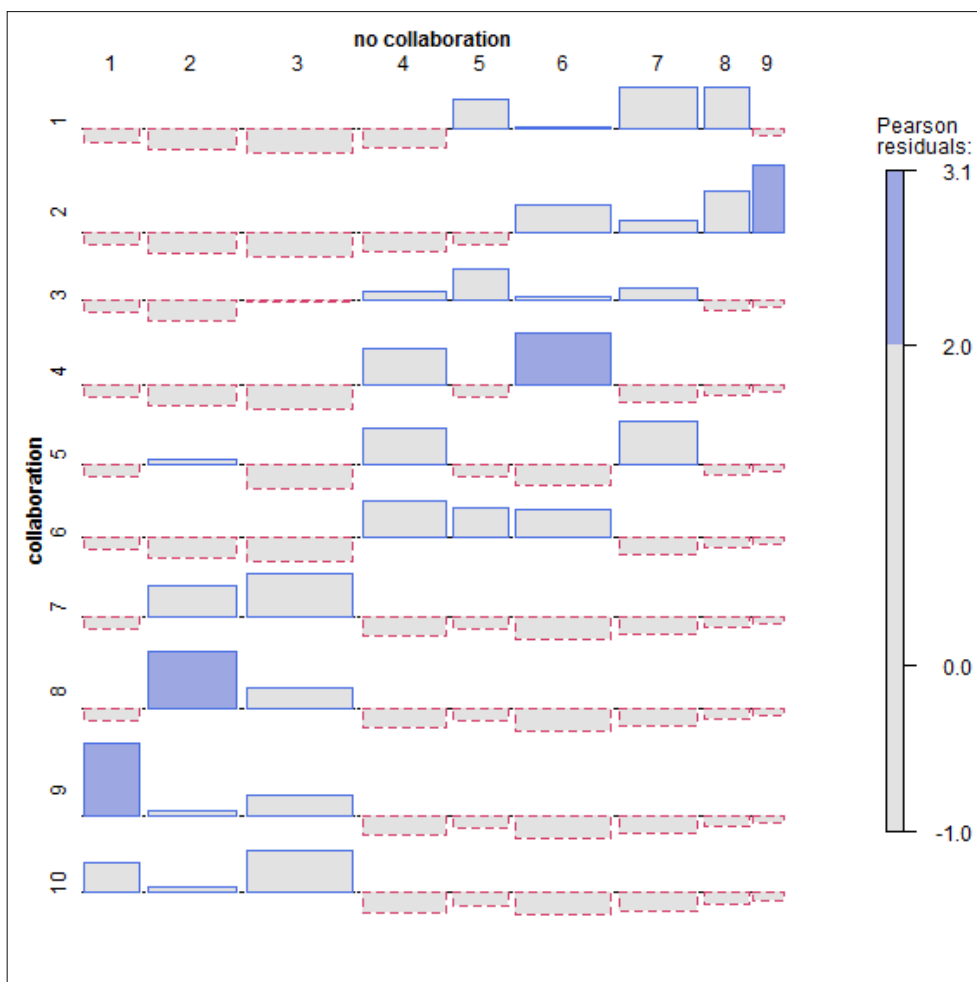

Figure 2 – Evaluation of access to funding sources of start-up companies according to collaboration

The Figure 2 demonstrates how the access to funding sources varies according to state of start-up collaboration. The findings show that collaboration with universities or other firms behaves as an assumption for better access to funding sources for more start-up companies. Better access to finance, which is demostrated by values 9 and 10, is reached by companies with collaboration activities.

5.3 Analysis of demanded and availed services

As it is stated in the theoretical overview start-up companies have different needs according to their stage of development. Therefore, start-up companies were

asked to select from 22 proposed services those services, which they used or they want use but have no access to them. Results of correspondence analysis are presented below.
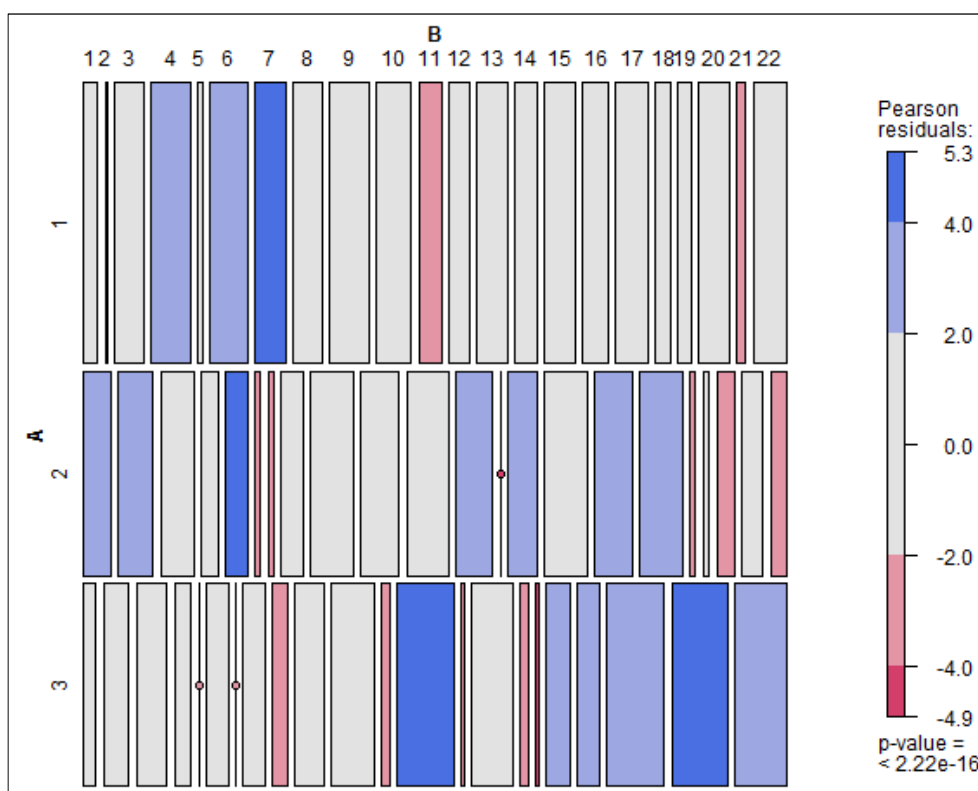

Figure 3 – The demanded services by the start-up companies according to the development phase

Legend of the A axis – development phase: 1 – initial phase, 2 – start phase, 3 – growth phase. Legend of the B axis – services: 1 – accounting services, 2 – management services, 3 – marketing services, 4 – financial services, 5 – creative services, 6 – lectures with successful entrepreneurs, 7 – supporting in creation of business plan, 8 – mentoring in field of development of product and services, 9 – mentoring in field of company funding, 10 – mentoring in field of advice about company growth, 11 – free or subsidised access to law advice, 12 – free or subsidised access to accounting services, 13 – free or subsidised access to creating business plan services, 14 – free or subsidised access to opportunity of company funding, 15 – free or subsidised access to patent and intellectual property, 16 – free or subsidised access to company setup, 17 – free or subsidised access to partner searching, 18 – privileged access to office space, 19 – privileged access to technology and production space, 20 – privileged access to technological equipment, 21 – privileged access to accelerator and incubator services, 22 – competition and events organised by public and private institutions.

In the case of the demanded services (Figure 3), the highest value of Pearson's residuals was investigated in the services aimed at supporting the creation of business plan, helping in financial services and organizing giving lectures with successful entrepreneurs. This type of services was demanded from companies at their initial phase, while companies at their start phase demand for management, accounting and creative services; free or subsidised access to partner searching and company funding. Finally, companies at their growth phase demand for privileged access to office space, technology, equipment and especially to accelerator and incubator. The higher value of Pearson's residuals was observed also in the services organizing competition and events.
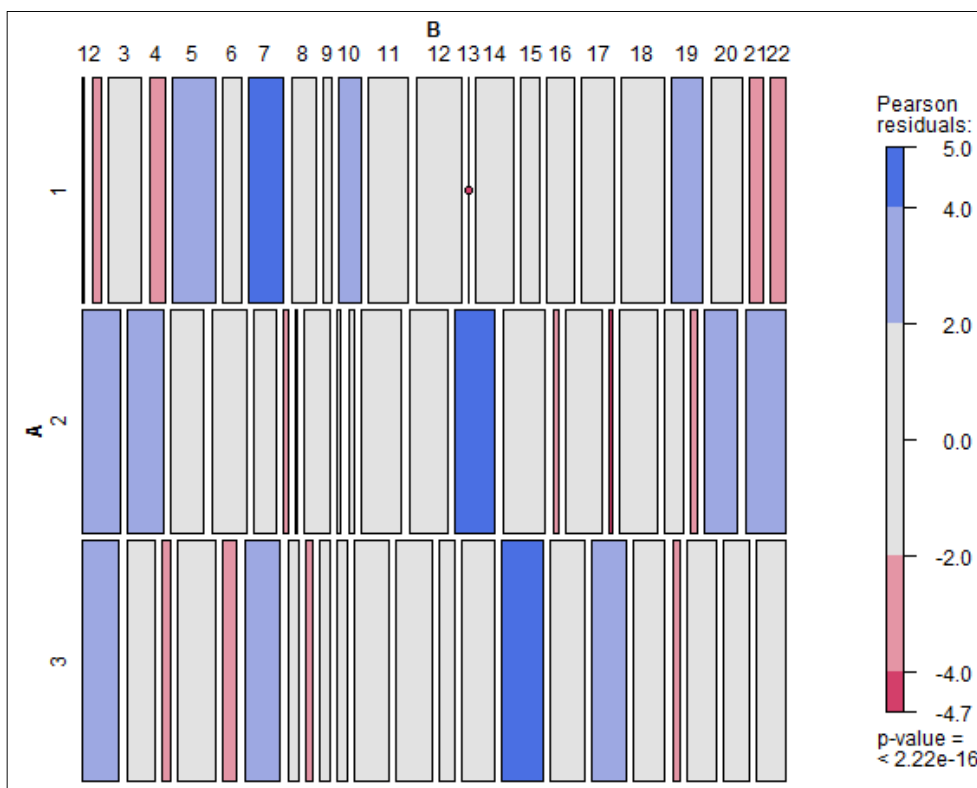

Figure 4 – The availed services by the start-up companies according to the development phase

Further, we investigate the availed services that start-up companies requested and also used for their better performance in competition among other companies in the market as seen in the Figure 4. The higher positive Pearson's residual at the initial phase were observed in services aimed at supporting the creation of business plan and mentoring services intended on giving advice about company growth. At the start phase they mostly availed services concerning to free or subsidisied access to creating bussinesss plan and to accounting and management

services. Start-up companies at their growth phase of development used mainly services helping in access to partner searching and in access to law advice.

Further in our analysis we propose two following hypotheses to statistically test the obvious relationship between stage of development and different kind of demanded and availed services:

- H_0: *there is no statistically significant relationship between the stage of development and specific demanded and availed services.*

- H_1: *there is statistically significant relationship between the stage of development and specific demanded and availed services.*

To find out, which one of these hypotheses is statistically true, we have applied the Pearson's chi-square test. Its statistics stands at a level of 5.4282 at 42 degrees of freedom with p-value reaching a value of 0.0049. Hence, we are able to reject the zero hypothesis H_0 and admit hypothesis H_1, which means that there is statistically significant relationship between the stage of development of start-up companies and kind of demanded and availed services.

6   CONCLUSION

Presented study empirically investigates start-up companies in terms of their specific needs they required and their source of funding. The analysis of start-up in the Košice region has shown that there is significant change in funding depending on the development stage of start-up companies. Subsidised bank loans are important formal financial sources for many start-up companies at their initial and start phase of development. After surviving the first initial phase, start-up companies gain enough courage to find financial support from other funding sources, such as business angels and structural funds. As start-up companies face several challenges in their efforts to access the finance, central government should collaborate effectively with private sector institutions to ensure adequate access to finance. As in Slovakia there is a just a small number of business angels and also public awareness about venture capital is low, government initiatives should support public awareness of entrepreneurship by activities such as advertising campaigns, awards or business plan competition. We also found, that the start-up community sees less favourable conditions in risk funding in Slovakia compared to western EU countries. This can cause outflow of interesting and competitive start-ups from Slovakia, which can have negative impact on the economy.

Our results also revealed that there exist significant relationship between stage of development of start-up companies and their specific needs. While in the initial stage of their development they need financial services, at the start phase they seek potential new partners and at the growth phase they look for access to incubators or accelerators. Incubators can help to modernise the regional

economy and to retain local resources. Public support to establish and run incubators or accelerators should be provided by local or regional governments.
The results of analysis also reveal that, at first glance, start-up companies, which collaborate with the firms or universities, have higher level of profitability and better access to finance. Frequent collaboration may be a driving force behind firm prosperity. To be prosperous in later stages of development, regional innovation policy should provide and also promote incentives for firm cooperation. To sum up, conducted research provides an interesting key input for both public decisions makers and representatives, who can draw implications for adjustment of policy instruments for supporting stat-up companies. Those instruments have a potential to ensure sustainable socio-economic development.

ACKNOWLEDGMENTS

REFERENCES

Alweendo, T., 2004. *Keynote Address at the Opening Ceremony of the 6th African Development Finance Conference and SMME Awards*, Cape Town, South Africa, 20–21 October 2004.

Blank, S. and Dorf, B., 2012. *The startup owner's manual: the step-by-step guide for building a great company*. Pescadero: K & S Ranch.

Bürgel, O., Fier, A., Licht, G. and Murray, G., 1998. *Internationalisation of High-Tech Start-Ups and Fast Growth - Evidence for UK and Germany.* [pdf] Available at: http://ftp.zew.de/pub/zew-docs/dp/dp0035.pdf [Accessed 25 November 2015].

Chorev, S., and Anderson, A., 2008. Success factors for high-tech start ups: Views and lessons of Israeli experts. In: A. Groen et al., ed. 2008. *New technology-based firms in the new millenium.* Emerald Group Publishing, pp. 44–68.

City of Košice, 2015. *Guide to investment in Košice.* [pdf] Available at: http://www.kosice.sk/static/prilohy/KE_investment_bulletin2015.pdf [Accessed 25 November 2015].

Cvijanović, V., Marović, M. and Sruk, B., 2008. *Financiranje malih i srednjih poduzeća*. Zagreb: Binoza Press.

Čalopa, M.K., Horvat, J. and Lalić, M., 2014. Analysis of financing sources for start-up companies. *Management*, 19(2), pp.19–44.

Džupka, P., Vajda, V., 2014. Start-up and Spin-off Does They Require Different Support? In: *5th Central European Conference in Regional Science*. Košice, Slovakia, pp. 205–214. Available at: http://www3.ekf.tuke.sk/cers/files/zbornik2014/PDF/Dzupka,%20Vajda.pdf [Accessed 25 November 2015].

European Commission, 2015. *User guide to the SME definition*. [pdf] Available at: http://ec.europa.eu/DocsRoom/documents/10109/attachments/1/translations/en/renditions/pdf [Accessed 25 November 2015].

George, G., Zahra, S.A. and Wood, D.R., 2002. The effects of business-university alliances on innovative output and financial performance: a study of publicly traded biotechnology companies. *Journal of Business Venturing*, 17(6), pp. 577–609. DOI: 10.1016/S0883-9026(01)00069-6.

Grant, R.M., 1998. *Contemporary strategy analysis*. 8th ed. New York: Blackwell.

Gübeli M,H., Doloreux, D., 2005. An empirical study of university spin-off development. *European Journal of Innovation Management*, 8(3), pp. 269–282.

Kazanjian, R.K., 1988. Relation of dominant problems to stages growth in technology-based new ventures. *Academy of Management Journal*, 31(2), pp. 257-279.

Lavčák, M., Hudec, O., 2015. *The Late Turn-Out of the Slovak Startup Factories: Locational and Institutional Factors*. [pdf] Available at: http://www-sre.wu.ac.at/ersa/ersaconfs/ersa15/e150825aFinal01242.pdf [Accessed 25 November 2015].

Lejpras, A., 2012. How Innovative Are Spin-Offs at Later Stages of Development? Comparing Innovativeness of Established Research Spin-Offs and Otherwise Created Firms. *Small Business Economics*, 43(2), pp.327–351. DOI: 10.1007/s11187-013-9534-4.

Lerner, J., 1994. The Importance of Patent Scope - an Empirical-Analysis. *RAND Journal of Economics*, 25(2), pp.319–333.

Leland, H., Pyle, D., 1977. Informational asymmetries, financial structure, and financial intermediation. *Journal of Finance* 32(2), pp.371–387.

Liebeskind, J.P., Oliver, A.L., Zucker, L. and Brewer, M., 1996. Social networks, learning, and flexibility: Sourcing scientific knowledge in new biotechnology firms. *Organization Science, 7*(4), pp. 428–443. DOI: 10.3386/w5320.

Mazania, M., Fatoki, O., 2012. Perceptions of Start-up Small and Medium-Sized Enterprises (SMEs) on the Importance of Business Development Services Providers (BDS) on Improving Access to Finance in South Africa. *Journal of social sciences*, 30(1), pp.31–41.

Maurya, A., 2012. *Running Lean: Iterate from Plan A to a Plan That Works*. California: O´Reilly Media.

Muller, B., Rammer, Ch., 2012. *Start-up promotion instruments in OECD countries and their application in developing countries*. [pdf] GIZ GmbH. Available at: http://ftp.zew.de/pub/zew-docs/gutachten/start-up-promotion2012.pdf [Accessed 25 November 2015].

Saini, S., Plowman, K., 2007. Effective communications in growing pre-IPO startups. *Journal of Promotion Management*, 13(3), pp.203–232. DOI: 10.1080/10496490802308547.

Skuladotir, Á., 2013. "*It is like asking someone: how do you walk?" The role of communication in start-up companies*. MSc. Aalto University. Available at: http://epub.lib.aalto.fi/en/ethesis/pdf/13207/hse_ethesis_13207.pdf[Accessed 25 November 2015].

Spišáková, E., 2010. Analysis of innovation activity of Slovak and Czech enterprises. *Quality Innovation Prosperity*, 14(1–2), pp.42–56. DOI: 10.12776/qip.v14i1-2.33.

Yelland, P. M., 2010. An Introduction to Correspondence Analysis. *The Mathematica Journal*, 12(1), pp.86–109. Available at: http://www.mathematica-journal.com/data/uploads/2010/09/Yelland.pdf [Accessed 25 November 2015].

ABOUT THE AUTHORS

Peter Džupka is associate professor and head of the Department of Regional Science and Management of the Faculty of Economics of the Technical University of Košice, Slovakia. E-mail contact: peter.dzupka@tuke.sk.

Slávka Klasová is assistant professor at the Department of Regional Science and Management of the Faculty of Economics of the Technical University of Košice, Slovakia. E-mail contact: slavka.klasova@tuke.sk.

Viliam Kováč is young researcher at the Department of Finance of the Faculty of Economics of the Technical University of Košice, Slovakia. E-mail contact: viliam.kovac@tuke.sk.