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THE IMPACT OF COOPERATION AMONG SMALL AND MEDIUM-SIZED ENTERPRISES ON THEIR INNOVATION CAPABILITIES

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Abstract

Background. Although in recent years several measures, government activities, projects, and increased R&D resources have motivated and assisted companies in their innovation activities, the aggregated innovation activity indicators of Hungary (summary innovation index – SII, innovation union scoreboard index – the index-IUS) and the statistics still show a strong fullback compared to the member states of the European Union. This is especially true regarding the region of Northern Hungary, where innovation would be essential for the future and competitiveness of small and medium enterprises.

Research aims. The primary aim of the research is to examine whether there is cooperation between companies and stakeholders. To observe what is the frequency and depth of the cooperation between the studied companies and the stakeholders. In general, is there a relationship between cooperation and innovation? What kind of sources of innovation are preferred by the surveyed companies? Where does the capital for innovation come from?

Methodology. The primary research examines the innovation activities of small and medium-sized enterprises and the related forms of cooperation. The research database was provided by a questionnaire survey conducted by managers of small and medium-sized enterprises operating in Northern Hungary, which was carried out in 2015.

Key findings. This research showed that there is a significant correlation between the level of cooperation and innovation. It shows which are those innovation activities (market pull and demand push) among the studied companies that are preferred; and how the degree of willingness to cooperate impacts the way of innovation.

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The research reflects the openness to innovation of the leaders of the small and medium-sized enterprises and the research showed that the most preferred form of innovation within the market is pull innovation. However, the company leaders know that the resource intensity of innovation is very high and they need external resources, which they do not prefer. The use of bank loans to the innovation is low (only 27% in 2015 among Hungarian SMEs). The companies prefer the development support from the state or local governments.

Keywords: Cooperation, Innovation, SMEs.

INTRODUCTION AND BACKGROUND

The concept of innovation

Having studied the literature, there are several approaches to the concept of innovation. However different they are, their main idea about innovation is the same that is "new idea, device or method". The word innovation means "restoration, renewal", from Late Latin innovationem (nominative innovatio), noun of action from past participle stem of innovare ("to change; to renew") and it means "a novel change, experimental variation, new thing introduced in an established arrangement" (http://www.etymonline.com).

One of the first researchers who formulated the definition of innovation was Joseph Schumpeter, an Austrian economist, who in 1934 saw innovation in a technological sense. Later many other researchers attempted to define the concept of innovation Barnett (1953), Thompson (1965), Zaltman et al. (1973), Freeman (1974), Kimberly (1981), Nelson and Winter (1982), Drucker (1985), Van de Ven (1986), Porter (1990), Cros (1993), Damanpour (1996), Klein and Sorra (1996), Frascati (2002), Berthon et al. (2004), Roper and Love (2004), and it was even defined in the Oslo Manual (2005), however, these approaches to innovation are rather different. Baregheh et al. (2009) collected more than 60 different definitions and analysed them from a semantic point of view. According to them there are researchers who approach innovation from the aspect of Business and Management, Economy, Marketing, Innovation and Entrepreneurship, Organization studies, and Knowledge Management, of course there are some from the technology, science, and engineering aspect.

In 2006 the European Union defined the concept of innovation: Innovation is the application of knowledge the renewal and increase of products and services, applying new methods in production, distribution, management, organisations, and working conditions, expanding and renewing the knowledge of workforce.

According to the literature, innovation can be segmented differently. One interesting approach is that not only essential changes are accounted for as innovation, but also the renewed technology of former production and technologies. According to this, three main groups can be distinguished.

- base innovation: genuinely new development;
- developer innovation: these are realised within an already existing solution;
- mock innovation: innovation does not affect the technology or the product, these innovations can sell the product better.

The Oslo Manual (2005) defines 4 groups of innovation: product, process, marketing, and organisational.

Considering the novelty of the innovation Freeman and Perez (1988) give 4 categories:

- incremental: small modifications, cost decrease, better performance;
- radical: breaks off with former traditions;
- production process: reforming a production technology;
- paradigm change: changing an aspect of a given technology.

However, innovation cannot only be classified by its meaning and novelty, Baregheh et al. (2009) classified innovation based on the type, nature, social content, and aim of innovation (Figure 1).

The concepts and theories of innovation are still a well-established area, which undergoes constant changes, so this field of research is a real challenge.

There are really many approaches towards innovation, however their main understanding of it does not differ from each other so much as they focus on novelty. In this present study innovation is understood and approached from this angle, innovation means a kind of development and it also includes novelty at the same time.

In the world of business there is a force of innovation. The profitable companies achieve their success significantly by launching new products. Trends have a strong impact on the innovation technology of the companies.

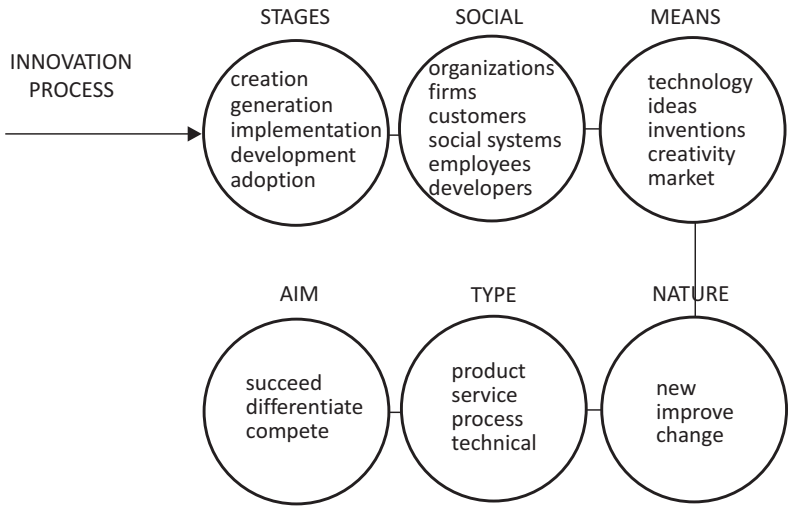

Figure 1. Classification of the innovation

Source: Baregheh et al., 2009, p. 11.

Innovation has two starting points: the inner (technologies) and outer (market) chances.

Innovation influenced by the market means that the technology is developed to meet the needs of the end-users. During the research, we would like to see the exact market needs as it can show the way to the direction and extent of innovation. An exact project plan can be prepared according to the results of the research. The typical example is of medicine production, where the need for a more effective treatment of illnesses brings development.

Innovation influenced by technology means that a market is searched for the new production technology with the help of marketing to explore the potential gaps in the market.

Technological innovation: a set of scientific, technical, organizational, management and commercial operations to improve the efficiency, profitability of economic activity and to achieve favourable social and environmental impacts resulting in the creation of new or substantially modified products, processes, services, new or substantially modified procedures, technologies and market launches, including changes that are only novel in a given sector or organization (CXXXIV of 2004. Act on Research and Development and Technological Innovation).

There are circumstances where both technology and market gaps are available, and these are lucky, fast, and easy-to-gain innovations. However, random developments occur, when none of the above two factors are available, but a breakthrough is made.

INNOVATION AND COOPERATION

The importance of innovation is no longer needed to be justified nowadays, however, due to the link to the topic, only one or two ideas will be described in this study.

Successful innovation and financial performance are inextricably linked, as innovation is the key to economic growth, and at the same time it has many other benefits for both the company and the society.

Corporate benefits include:

- increase in profits;
- targeting new segments;
- reducing production costs;
- increasing market share;
- increasing competitiveness;
- creating jobs.

Notwithstanding its social and environmental benefits, despite the many motivating factors, in Hungary, companies mostly only talk about innovation and innovation opportunities, but few companies embody innovation in their strategies and do something.

However, there are several extents of cooperation. The best-known classical summary of it is the theory of "strength of weak bonds" and the "social embeddedness of the economy" (Granovetter, 1994), network society, network economy.

Beyond the trust is the basis of cooperation of a network of stakeholders. By analysing the agricultural sector, it can be stated, that the role of cooperation, the share of resources and strengthening the market position with concentrated products are important. The need for cooperation, the need of trust among the stakeholders plays an important role in agribusiness as well (Wilson, 2000; Szabó, 2010; Takács, 2012; Baranyai, 2014; Takács & Baranyai, 2010).

Hence, cooperation would be an effective solution because Hungary's innovation performance is not in an honourable place on the European Innovation Scoreboard in 2017 (Figure 2).

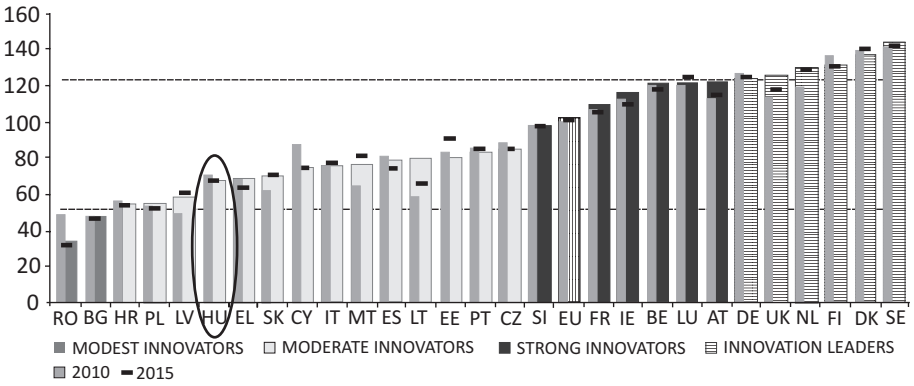

Figure 2. Performance of EU Member States' innovation system

Source: European Commission, European Innovation Scoreboard 2017 p.6. http://europa.eu/

Hungary's performance is below the EU average. The research studied the performance changes over time for each of the innovation performance groups and the Member States were included in each of these groups. It shows, that for Hungary, the performance declined by up to –3.5% between 2010 and 2016.

However, both academics and business leaders agree that beyond the strategic thinking, the innovation, renewability, and flexibility the strength of the smallest companies may have been important, if they are able and willing to cooperate in different areas of the economy. (Salamonné 2008; Takács-György, Takács 2011; Csesznák, Wimmer 2011; Szerb et al., 2014; Chikán et al., 2014). Networking as one of the factors of competitiveness is identified by several authors (Czizmadia, 2004; Mandják et al., 2012; Szerb et al., 2014).

The data of the European Commission shows another result. According to company size there are huge differences in R&D spending and innovation activities (Figure 3).

Kállay (2012) obtained similar results. He studied not only the factors effecting the competitiveness, but also the attitude and the innovativeness (realising of innovators in a certain year, and the R&D ratio). Both attitudes showed a higher value at the higher size category.

Financial resources are indeed indispensable, but cooperation can also greatly alleviate this difficulty. A prerequisite for competitiveness and innovation is the recognition of cooperation and its benefits. Although there is a great deal of literature on the importance of the

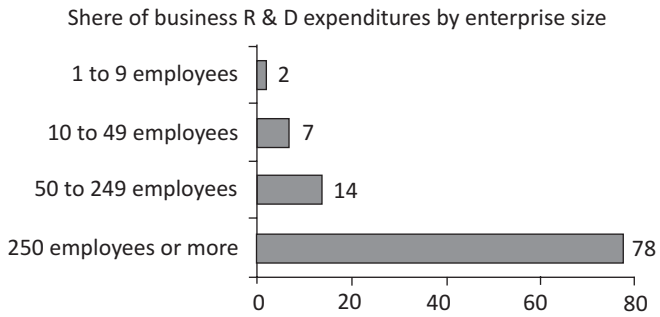

Figure 3. Enterprise size and business R&D expenditures, Average 2011–2014 data for EU28

Source: European Commission, European Innovation Scoreboard, 2017, p. 12.

relationship between these two areas (innovation and cooperation), the level of innovation and willingness to cooperate in Hungary is far below the European average. For this reason, the aim of this research was to investigate innovation and cooperation to reveal the current situation among the companies of the Northern Hungarian and the Central Hungarian regions.

A1: The primary aim of the research is to examine whether there is cooperation between companies and stakeholders?

A2: The research aims to observe what is the frequency and depth of the cooperation between the studied companies and the stakeholders.

A3: In general, is there a relationship between cooperation and innovation?

A4: What kind of sources of innovation are preferred by the surveyed companies? Where does the capital for innovation come from?

MATERIAL AND METHODS

First the multitude was defined, the target multitude became the leaders of those companies which had at least 10 and a maximum of 249 employees. It was decided to ask leaders of SMEs in my neighbourhood, that is Central Hungary and Northern of Hungary (Budapest, Pest, Heves, Nógrád, and Borsod-Abaúj-Zemplén counties). See Figure 4.

During the quantitative research one of the non-random sample methods the so-called snowball sampling and personal interview

methods were used. The interviewers were students of the Róbert Károly College and they could collect information from 250 CEOs. The interviews were conducted throughout 2015.

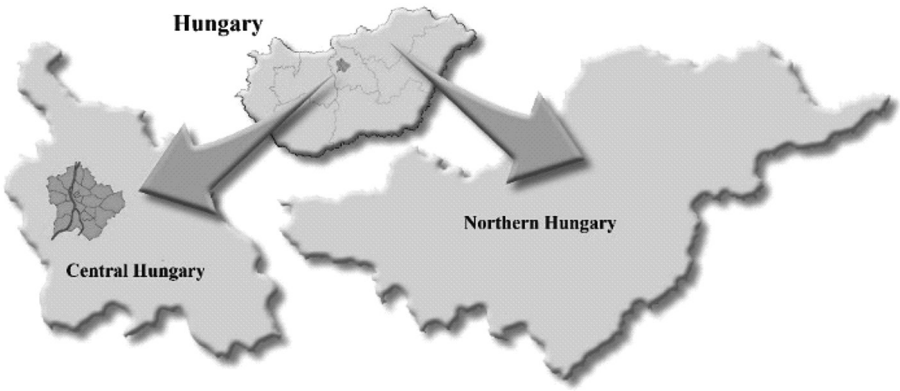

Figure 4. The regions of the sample

Source: own construction.

The data collection was conducted through surveys. In the first part of the questionnaire, the following questions were grouped:

1) cooperation and trust;
2) individual values of the company leaders;
3) innovation;
4) stakeholders.

In the second part of the survey the characteristics of the company and the demographic characteristics of the respondents were focused on.

The core of the research was four groups of questions aiming to find out the correlation between the cooperation and the other parts (innovation, trust, and individual values) among the stakeholders. Before formulating the questions several research methods of international and national secondary researches were examined.

The itemised assessment scale method was used during the above mentioned research phases. The respondents were asked to evaluate the cooperation and the innovation level of their companies on a six-level Likert item. A reliability test was carried out and the guideline was considered to be above 0.6 Crombach's Alpha. The questionnaire contained other open and closed questions as well.

Although the research dealt with several sub-areas (Benedek, 2017; Takács-Benedek, 2016), the present study points out only those details that are relevant from the above-mentioned point of view. It must be mentioned that the research is not a representative research because of the lack of financial resources, nonetheless it brought about important and interesting results. The results can be interpreted only in the context of the sample.

RESULTS

The cooperation willingness of companies with stakeholders

Although economists and theoretical experts (Dodd, 1932; Berle & Means, 1933) have been involved with the stakeholder theory already for years, stakeholders only needed to be dealt with in the second half of the 20th century, when companies needed to pay more attention to the other stakeholders beyond the shareholders and investors. It becomes apparent that the companies embedded in society provide social services (creating workplaces, contribution to social welfare, meeting the needs of the consumers, etc.) and also profitable growth (Szlávik, 2009).

Nowadays, stakeholder management is part of the strategic management, so the primary aim of any effective company management is to consider the stakeholder.

According to Freeman (1984) a stakeholder is any kind of group or individual, that influences or has an interest in the aims of an organisation.

The company does not exist anymore as a legal tool for an individual to carry out personal business transactions. Although many companies are used in this way, the company form has a greater importance. The company became the method of the personalisation of the property (Boda, 1996).

The research studied 11 relevant stakeholders (National Governments, Local Governments, Chambers, banks and credit institutions, experts, NGOs, higher education / educational institutions, competitors, suppliers, buyers/customers, and employees).

However, to be able to handle and interpret this multi-coloured circle of contacts, it was decided to reduce the number of variables.

The factor analysis established differentiated factors well and clearly, which were the following:

- long-term, continuous and strong strategic partnership segment;
- relevant stakeholder segment for the operation and the cooperation of the company;
- superficial stakeholder relationship segment.

The multivariate analysis distinguished three segments of interest that are illustrated in Figure 5.

The research measured the frequency and the depth of cooperation among the composed segments on the five point Likert scale, where each stakeholder could score points from 1 to 5.

Out of the stakeholders of the 250 companies achieving the efficient score, the stakeholders with a long-term, continuous, and strong strategic partnership (suppliers, buyers, employees) can be found in close proximity to the company and they have reached the highest average score of 3.5653 on the scale of cooperation rate/ intensity scale. It is followed by the corporations ranked with an average point of cooperation of 3.1136, the relevant stakeholder segment for the operation and the cooperation of the company (banks and credit institutions, national government, local governments and chambers) and in the end the superficial stakeholder relationship segment (NGOs, higher education / educational institutions, competitors) with a score of 2.0080 (see Figure 6).

Although the difference between the stakeholder segments is shown in Figure 4, it cannot be shown statistically which groups differ significantly when it comes to cooperation. That is the reason why the three variables have been justified by pairs of pairs. Using the non-parametric, Wilcoxon test a significant difference ($p = 0{,}000$) in the frequency and depth of the interaction of all the affected groups was shown.

Overviewing the literature, it can be seen that several researches deal with the segmentation of the stakeholders.

Whereas Szlávik (2009) groups the stakeholders according to the level of communication, our research segments the stakeholders according to the company's connection and the frequency and depth of cooperation. According to Szlávik (2009) at the first level, companies try to map the interests of the stakeholders, then these interests are built in the process of the company and finally the companies with the most developed stakeholder-management communicate with and take care of their stakeholders.

	Item Description	1. Component	2. Component	3. Component
relevant stakeolder segment for the operation and the cooperation of the company	National Govemment	.792	.167	.098
	Local Governments	.772	.119	.157
	Chambers of commerce	.707	.095	.150
	Banks and credit institutions	.671	–.029	.295
	Experts	.634	.300	.144
superficial stakeholder relationship segment	NGOs	.053	.847	.170
	Educational institutions	.141	.845	.020
	Competitors	.434	.569	–.178
long-term, continuous and strong strategic partnership segment	Suppliers	.112	.112	.803
	Customes	.130	–.095	.736
	Employees	.326	.121	.658

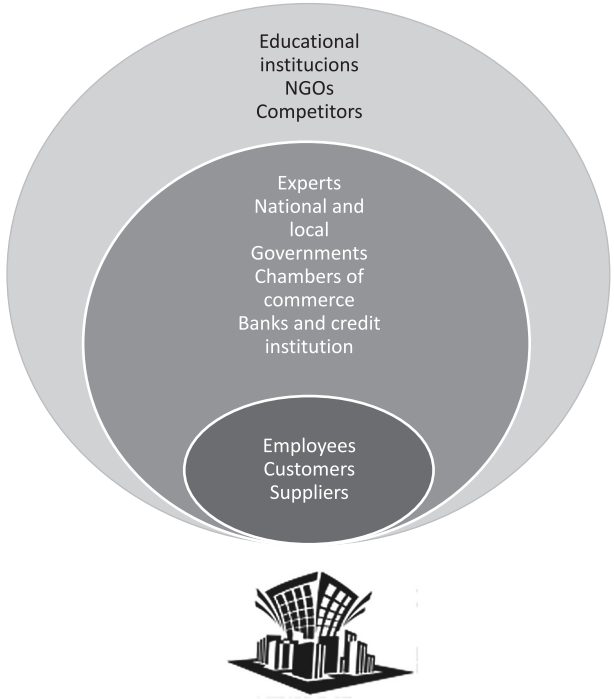

Figure 5. Stakeholder segments based on the frequency of the cooperation

Source: own construction, standard interview, KMO index: (.814), Bartlett-test: ($p < 0.05$) 2015, N = 250.

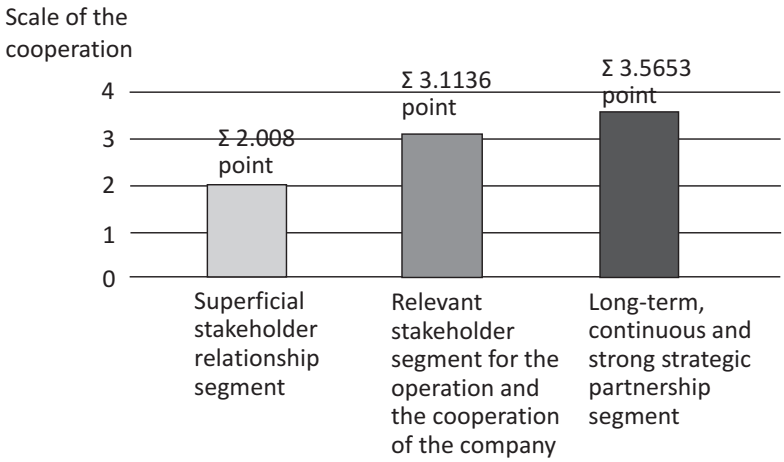

Figure 6. Level of the cooperation among the stakeholder segments

Source: own construction, standard interview, 2015, N = 250.

At the level of transaction, there is a basic information flow between the company and the stakeholders.

The empirical research by Wimmer and Malotay (2017) distinguished three stakeholder groups:

1) shareholders and managers;
2) market (operation) related stakeholders, such as customers, suppliers and employees;
3) non-market-related stakeholders, such as the state, trade unions, local communities, natural environment, and the media.

By studying the literature it is possible to find other segmentations as well.

One of the well-known and often used segmentation is according to the nature of the relationship (Szlávik, 2009; Chikán, 2006; Benedek et al., 2013; Supino & Proto, 2006) where the market (suppliers, competitors, buyers, etc.) and non-market (authorities, interest groups, media, etc.) can be distinguished.

However, it is very common to segment the stakeholders according to the legal status of the persons or to categorise according to their location, which can be distinguished by groups of individuals involved in internal (employees, consultants, investors, …) and external (media, competitors, authorities, local government, government, …) (Szlávik, 2009)

Investigating the contact system of the companies, the possibilities of further segmentation also arise, according to which researchers in the company's micro- and macro-environment (Málovics, 2009), it raises the understanding of the affected circle, according to which the individual studies are local (local governments, residents, etc.) and national stakeholders (state /government, media, consumer protection and other interest protection groups, etc.).

At the same time, according to the dimensions of corporate social responsibility (CSR), environmentally (environmentalists, residents, etc.) and socially relevant groups (Benedek et al., 2013) as well as public and non-public stakeholders.

Of course, a person may appear in multiple roles at a time, that is, he may be a carrier of several interests (Chikán, 2006), so the segmentation depends on the aim of the research.

Studying the 11 stakeholders in this sample one by one, it can be concluded that the strength of cooperation between the companies and competitors and between the companies and higher education institutions are the weakest. One of the strongest reasons of the weakness of cooperation is mistrust.

According to a previous corporate survey (Chikán et al., 2014), the role of higher education in the competitiveness of companies is neutral (78%) or interfering (12%), which presumably does not promote the development of future strategic partnerships. However, the dual training introduced in higher education might modify this cooperation significantly later.

Openness to innovation

Nowadays, innovation is omnipresent, however, it is not easy to find a single well-formed definition for it.

Several researchers mention the cooperation and collaboration (the highest level of cooperation) as a factor that influences the openness of innovation. Thus, the present study focuses on this aspect and the research studied pull and demand push innovation of the market (Arnold & Bell, 2001).

According to the Spearman rank correlation the level of cooperation and openness to innovation in general has a significant medium strong positive linear correlation ($r = 0{,}319$; $p < 0{,}05$).

The most preferred form of innovation within the demand push innovation is the introduction of new products and technologies in

the company, which was mentioned by 38% (93 companies) of the respondents.

The most preferred form of innovation within the market pull innovation is the market innovation, which was mentioned by 15% (38 companies) of the respondents and it is followed by the supplier innovation at 11% (25 companies).

The resource intensity of innovation is very high, while the available time is very short, so there is no opportunity to wait for. The only solution for the result is when companies combine external resources with the internal ones.

The recognition and timing of the necessity and opportunity for opening up to innovation processes are the essential issues.

Therefore, the empirical research has also focused on how often companies use external resources for innovation.

The companies surveyed are divided in the question of the use of external resources, of which they prefer primarily different subsidies, as opposed to banking, loans, or borrowing.

More than half (61%) of the surveyed companies claimed something in the form of development support from the state or local governments, but only 43% of them were successful.

So, those who claim support are fewer than those actually receiving support.

On the other hand, although the success of bank loans is higher, the business owners do not choose it at a high frequency, the use of bank loans to the innovation was only 27% in 2015 among the Hungarian SMEs in our sample.

DISCUSSION AND CONCLUSIONS

The statistical results have shown that cooperation in the realisation of innovation plays important roles.

In conclusion, it can be stated that companies recognise the importance of innovation, but only a few actually get to action. They prefer the demand push innovation, primarily the new products and technology innovation at the company. There are more and more corporations that spend money on R&D, but this budget still lags behind the budget of the other member states of the European Union.

Most of the companies covered their financial need for innovation in the form of state or local government development assistance, and only a small part of them is involved in bank loans.

This research has shown that there is a significant correlation between the level of cooperation and innovation.

The cooperation could be a factor in openness to innovation. However, the problem is that companies do not want to cooperate with the most important strategic partners, so with competitors and educational institutions, which is due to a lack of trust. Hence it would be advantageous to study this aspect, as well.

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WPŁYW WSPÓŁPRACY WŚRÓD MAŁYCH I ŚREDNICH PRZEDSIĘBIORSTW NA ICH MOŻLIWOŚCI INNOWACYJNOŚCI

Abstrakt

Tło badań. Chociaż w ostatnich latach wiele działań rządowych i projektów pozwala firmom uzyskać zasoby na badania i rozwój, to powstaje pytanie o wykorzystanie ich do działalności innowacyjnej, zwiększenia zagregowanych wskaźników aktywności innowacyjnej Węgier (sumaryczny wskaźnik innowacyjności – SII, indeks tablicy wyników innowacyjności – indeks-IUS). Statystyki nadal wykazują silne wsparcie w tym zakresie w porównaniu z państwami członkowskimi Unii Europejskiej. Dotyczy to w szczególności regionu północnych Węgier, gdzie innowacje są niezbędne dla przyszłości i konkurencyjności małych i średnich przedsiębiorstw.

Cele badań. Celem artykułu jest wskazanie zależności pomiędzy współpracą a innowacyjnością małych i średnich przedsiębiorstw.

Metoda. Zastosowano badanie podstawowe działalności innowacyjnej małych i średnich przedsiębiorstw oraz powiązane formy współpracy. Baza danych do badań została dostarczona za pomocą ankiety przeprowadzonej przez menedżerów małych i średnich przedsiębiorstw działających w północnych Węgrzech, która została przeprowadzona w 2015 r.

Kluczowe wnioski. Badania wykazały, że istnieje korelacja między poziomem współpracy i innowacjami. Ponadto pokazują, jakie są preferowane działania innowacyjne (przyciąganie rynku i popyt) wśród badanych firm oraz w jakim stopniu chęć współpracy wpływa na sposób innowacji.

Badania odzwierciedlają otwartość na innowacyjność liderów małych i średnich przedsiębiorstw oraz wykazuję, że najbardziej preferowaną formą innowacji na rynku jest innowacyjność. Jednak liderzy firmy wiedzą, że intensywność zasobów innowacji jest bardzo wysoka i wymagają zasobów zewnętrznych. Wykorzystanie kredytów bankowych do innowacji jest niskie (tylko 27% w 2015 r. wśród węgierskich MŚP). Firmy preferują wsparcie rozwojowe ze strony państwa lub samorządów.

Słowa kluczowe: współpraca, innowacje, MŚP.