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CONTEXTUAL VARIABLES OF OPEN INNOVATION PARADIGM IN THE BUSINESS ENVIRONMENT OF SLOVENIAN COMPANIES

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ABSTRACT: *This article addresses the current condition of Slovenian business environment and its support to open innovation. By carrying out qualitative empirical research, we investigate to what extent determinants from internal, narrower and broader external business environment influence open innovation in Slovenian companies. Several support mechanisms were established to create friendlier environment for open innovation. Our study indicates that if Slovenia wants to be successful on the long run, supportive environment cannot and should not be based solely on government financial support, but must also contain other elements that affect technological development, meaning: 1) organizational culture, values, reward system; 2) legislation; 3) tax and social contributions; 4) bureaucratic barriers; 5) human resources; and 6) favorable bank loans, bank guarantees, venture capital, etc. The paper concludes with implications for managers and policy makers, outlining several promising areas for future research.*

Key Words: *open innovation, internal business environment, narrower and broader external business environment, context dependency*

JEL classification: O32, O31, Q55

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1. INTRODUCTION

In last years, the world has been facing the deepest recession since the Second World War (Conway & Monaghan, 2009; Elliott, 2009; Fleming, 2009). Many companies have currently adopted open innovation models in an effort to survive and increase their innovativeness (Skerlavaj, Song and Lee, 2010) and consequently performance (Finger & Stucki, 2009; Lindgaard, 2010; Sousa, 2008; Yuen, Zeitoun & Smith, 2009). Open innovation, which was named and defined by Chesbrough (2006, p.1) “*is the use of purposive inflows and outflows of knowledge to accelerate internal innovation, and expand the markets for external use of innovation, respectively*”, can be useful in reducing costs of research and development (hereinafter R&D) and it can create new opportunities for growth. A company can locate some of innovation projects outside its corporate borders and so it can generate extra income by licensing. With external collaboration it can foster partner relationship and share costs and risks of major innovation projects with external partners. Companies can finance their innovation projects by acquiring external technology since during the crisis, many of their competitors are financially weaker. “Healthy” companies can create a competitive advantage by continuing their R&D projects. Huge savings are possible when companies develop new technologies in collaboration (Chesbrough & Garman, 2009; Vanhaverbeke, 2010).

Regarding the current state of the economy, businesses on all continents are trying to answer questions like what should be done differently so that such events will not be repeated, what can be done now in order to stimulate the economy, help its growth and with it to achieve recovery? The research question we would like to address in this paper is what can be done to improve and encourage open innovation within and among organizations at the level of narrower and broader business environment.

The advantages of companies’ cooperation are increasing in the open innovation era. As the focus shifted from internal R&D activities, academics started emphasizing that the companies should be open to innovation from the outside (Rigby & Zook, 2002; Christensen, Olesen & Kjær, 2005). Not all the expert work for one company, so companies need to cooperate and share their know-how and skills (Chesbrough, 2003; Enkel, Gassmann & Chesbrough, 2009). Koschatzky, Kulicke and Zenker (2001, p. 6) observed “*companies, which do not cooperate and which do not exchange knowledge, reduce their knowledge base on a long-term basis and lose the ability to enter into exchange relations with other firms and organizations*”. Collaboration with external partners is necessary to improve company’s innovativeness and to reduce time needed to enter the market. To put a more positive spin on the situation, what can the government and other company’s stakeholders do, what can be changed in context, in internal, narrower external and broader external environment, to accelerate open innovation?

Over the past years, scholars have produced a vast body of academic research on innovation (e.g. Jaffe, 1989; Adams, 1990; Nelson & Rosenberg, 1993; Mansfield, 1998; Cohen, Nelson & Walsh, 2002), but up until now, only a few empirical studies have been done on the topic of open innovation (Chesbrough, 2006; Finger & Stucki, 2009; Sousa, 2008; Enkel, et al., 2009; Lindgaard, 2010).

The purpose of this paper is to present the elements from internal, narrower and broader external business environment that can impact on open innovation in Slovenian companies. We aimed to determine the company's context (ecosystem) with the intention of finding out what the necessary and needed conditions for the companies to benefit from open innovation are. The paper is organized in seven sections. The next two sections provide a literature review along with the development of the research model. In the fourth section, the research methodology is explained. The results of the study are presented in the section five and six. The paper concludes with a discussion of the results, the contributions of the presented empirical study to the open innovation literature, research limitations and suggestions for future research.

2 LITERATURE REVIEW

2.1 Open Innovation

Two decades ago there were more economies of scale in R&D than there are today because of the increasing costs of development and shorter life cycles of products (Chesbrough, 2006; Chesbrough & Appleyard, 2007; Gassmann, et al., 2010). A new cooperative approach is emerging as an alternative to the closed innovation model. This new approach that is called open innovation, was defined by Chesbrough (2006, p.1): "*Open innovation assumes that firms can and should use external ideas as well as internal ideas, and internal and external paths to market, as they look to advance their technology*".

In general there are two types of process to adapt open innovation: the outside-in and the inside-out process. The inbound process utilizes external sources of innovation with the purpose of integrating external know how and innovation into the company (e.g. acquiring and sourcing). The outbound process on the other side exploits external innovation opportunities with internal capabilities and resources (selling and revealing). However, there are some firms that combine both and use a coupled process of open innovation (Enkel et al., 2009, Dahlandera and Gannb, 2010).

Some industries have been using open innovation model for a long time, such as: Hollywood film industry and modern investment banking (DeFillippi, Grabher & Jones, 2007) but many sectors are in transition between both models, the open and closed innovation model: automobiles, biotechnology, pharmaceuticals, healthcare, computers, software, communications, etc. (Niosi, Saviotti, Bellon & Crow, 1993; Van Der Meer, 2007).

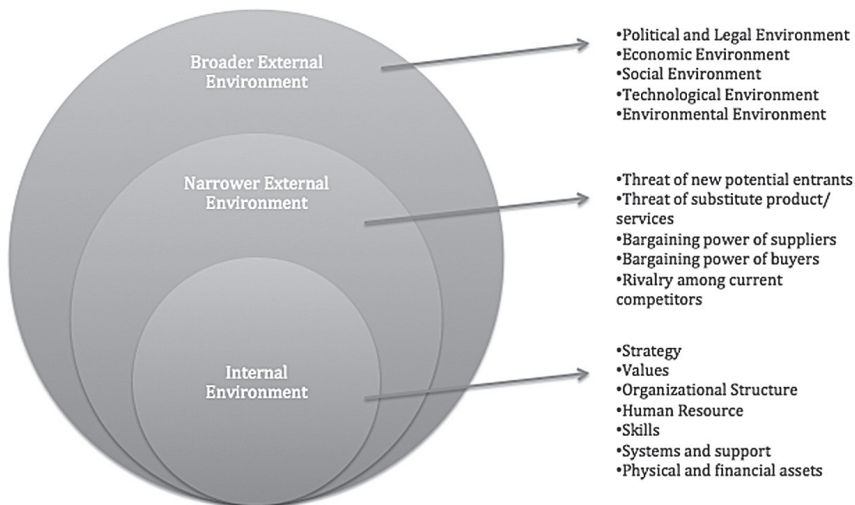
The main difference between the closed and open innovation paradigm lies in fact that companies, which are using the open innovation paradigm interact with external partners (Dittrich & Duysters, 2007, DeFillippi, Grabher & Jones, 2007). Major reasons for shifting from closed to open innovation are workers' increasing availability and mobility as well as external suppliers' increasing capability (Chesbrough, 2003). Evidence from

the past identifies innovation as the main driver for companies to prosper, grow and sustain high profits (Drucker, 1988). As result, main question is no longer why innovation is important but the focus lies on how to innovate and how the innovation processes can be managed (Gassmann & Enkel, 2004).

2.2 Business Environment

Evidence from the past identifies innovation as the main driver for companies to prosper, grow and sustain high profits (Drucker, 1988). This means that the main question is no longer why innovation is important but the focus lies on how to innovate and how the innovation processes can be managed (Gassmann et al., 2004). The formula for business success requires two basic elements – company’s employees and environment. If either of them is missing, the success becomes impossible (Aguilar, 1967). The term business environment indicates internal factors and those external forces and institutions that are beyond the control of individual companies but they still affect its business (Stead, Worrell & Stead, 1990). These forces can affect the business directly or they can have an indirect effect on it (Miller, 1988).

Fig. 1: *Contextual variables of open innovation research model*



Source: Stead, Worrell and Stead, 1990.

Since it is very difficult to predict future changes, especially when the environment varies too frequently, the business environment becomes uncertain and the risk for companies increases. Sectors with extremely big business environment changes are information technology and fashion industry (Milliken, 1987; Koberg & Ungson, 1987). Business environment can be further divided into internal and narrower and broader external environment (Kanter, 1985).

3 THE CONCEPTUAL MODEL OF THE OPEN INNOVATION CONTEXT

National and regional policies intent to develop national and regional business environments that improve the prerequisites for added value based on open innovation. The initiatives implemented must be modified to suit challenges and companies must pursue with open innovation to transform themselves from what they are now to what they want to become in future.

As shown in Fig. 1 the internal environment is the environment that has a direct impact on business. It includes factors over which companies normally have control. Academics have searched for key elements that can affect company, including internal organizational factors such as: company's strategy and values (Sathe, 1985), organizational structure and staff capability (Child & Mansfield, 1972; Birkinshaw, Nobel & Ridderstrale, 2002; Mihm, et al., 2010), and management structure, support and systems (Stevenson & Jarillo, 1990; Kuratko, Hornsby, Naffziger & Montagnò, 1993; De Jong & Den Hartog, 2007).

External environment refers to the environment that has an indirect influence on business. These are all elements that company cannot control. A company as an open system interacts with environment around it and becomes dependent on it. This interaction challenges managers to respond creatively and act in innovative ways (Zahra & O'Neil, 1998). External environment comprises the main source of information for innovation improvement and company's opportunities and threats as it contains numerous elements that can influence companies (Damanpour & Schneider, 2006; Hashim, 2005). Elements of external environment are vital for product and process innovation (Lysonski, Levas & Lavenka, 1995).

The narrower external environment consists of elements from company's direct environment that affect company's performance. It includes new entrants, substitutes, suppliers, competitors and customers (Porter, 2008; Rackoff, Wiseman & Ullrich, 1985). The analysis of a broader external environment is the second part of external analysis when preparing strategic analysis. It is a useful strategic tool for understanding market growth or decline, business position, potential and direction for operations. Elements of broader external environment are usually more difficult to control than microenvironment elements (Grossman & Krueger, 1995) and broader external environment includes a political, economic, social and technological environment (Abea, Suzuki, Etoh, Sibagaki & Koike, 2008; Edgar, 1965; Farmer & Richman, 1964; Osborn & Hunt, 1974).

Open innovation has been recognized as one of the key factors of sustainable economic growth (Mehta & Mokashi-Punekar, 2008). Such economic growth can also be assured with a country's long-term economic and social development (Furman, Porter & Stern, 2002; Edquist, 1997).

It seems that open innovation is a term that is increasingly gaining attention but it is not frequently used in practice. Van de Vrande and de Man (2010) report that knowledge, which has been obtained from outside is not appreciated as much as knowledge that has

been developed within the company. Since the publication of Chesbrough's book the term open innovation is widely embraced by an increasing number of businesses in the U.S. In Slovenia, debate about open innovation context is mainly limited to academic circles (Cunningham, 2008). According to a study made by Rangus (2010) only few Slovenian companies innovate openly and 42.1% of surveyed companies have not yet heard about the concept of open innovation. Although some of her respondents were micro companies, still they hardly ever cooperate with external stakeholders. Rangus believes this could be a result of: (1) fear before stealing technology; (2) lack of knowledge about the concept of open innovation; or (3) the closed nature of Slovenian people.

4 RESEARCH METHODS

4.1 Research design

In order underline the theoretical findings set out in the previous sections we used a qualitative research method, which is based on information, expressed with words, opinions and feelings (Bogdan & Knopp Biklen, 1982; Patton, 2005). With the use of exploratory research we gathered preliminary information that helped us diagnosing the situation in Slovenian business environment and screen for new ideas and suggestions. Our exploratory research was conducted through the semi-structured interviews, since there has not been any in depth analysis made in Slovenia on this topic yet. The in-depth semi-structured interview itself is carried out to enable the researcher to answer one or more of his or her research questions (Taylor & Bogdan, 1998).

Our rationale for using an interview is three-fold. First, interviews give participants the opportunities to respond in their own words, rather than forcing them to choose from fixed responses, as quantitative methods do. They are particularly useful for getting the detailed information about a participant's thoughts and behaviors or experiences (Boyce & Neale, 2006). In-depth, semi-structured interviews have the ability to evoke responses that are unanticipated by the researcher and rich and explanatory in nature (McNamara, 1999). And finally, interviews are particularly useful for testing what people's responses would be to a particular issue and they present completely new issues, which interviewer had previously never considered (Wimmer and Dominick, 1997).

In order to prove greater validity we triangulated secondary data with excerpts of 14 interviews. The triangulation method is the combination of two or more data sources (quantitative and qualitative), methodologic approaches (Denzin, 1970; Eisenhardt, 1989; Altrichter, et al., 2008), or analytical methods (Kimchi et al., 1991) within the same study. In addition, authors claim that triangulation helps to overcome potential prejudice from using a single method (Hussey & Hussey, 1997). We have achieved triangulation by using more than one source of data that were collected from different sources - from existing researches, documents, interviews and policies and then we researched more in detail via the in-depth semi-structured interviews. After the interviews were carried out and transcribed we conducted the analyses of qualitative data using NVivo software.

4.2 Sample

We performed 14 in-depth semi-structured interviews with 7 companies and 7 governmental institutions that were arranged in advance. We used purposive sampling that ensured the selection of a theoretically relevant sample, which is highly recommended for exploratory research (Shaughnessy & Zechmeister, 1997). Although the small sample size does not allow us confident generalizations to the population of all companies and institutions in Slovenia, our sampling method ensures that the entities under investigation were all perfectly suited for the purpose of our research. This in turn increased the validity of the findings (Davidsson, 2004) that are largely in line with the relevant literature.

Table 1 provides an insight into interviewees' demographic data. In addition, to ensure face validity of our interviews, we pre-tested the questions with six experts. All interviews were made in interviewees' work place and they all agreed with publishing their answers in our paper. We prepared an interview guide in which research questions were given. After that, the semi-structured questions followed. The interviews were rounded off with a debriefing where the interviewees had a chance to add some comments. The length of the interview was ranging from 45 to 60 minutes. The interviews were audio recorded, later transcribed and sent to interviewees for confirmation.

Table 1: *Interviewee's demographic data*

Variable	Data												
Gender	<table border="0"> <tr> <td>Total</td> <td>Companies</td> <td>Institutions</td> </tr> <tr> <td>Female: 6</td> <td>Female: 1</td> <td>Female: 5</td> </tr> <tr> <td>Male: 8</td> <td>Male: 6</td> <td>Male: 2</td> </tr> </table>	Total	Companies	Institutions	Female: 6	Female: 1	Female: 5	Male: 8	Male: 6	Male: 2			
Total	Companies	Institutions											
Female: 6	Female: 1	Female: 5											
Male: 8	Male: 6	Male: 2											
Age	Range: 35-56 Average: 44 St. dev: 6.69												
Job Title	<table border="0"> <tr> <td>Companies</td> <td>Institutions</td> </tr> <tr> <td>Director and founder: 3</td> <td>Director: 3</td> </tr> <tr> <td>Director: 1</td> <td>Division director: 2</td> </tr> <tr> <td>Board member: 1</td> <td>Secretary: 2</td> </tr> <tr> <td>Manager: 2</td> <td></td> </tr> </table>	Companies	Institutions	Director and founder: 3	Director: 3	Director: 1	Division director: 2	Board member: 1	Secretary: 2	Manager: 2			
Companies	Institutions												
Director and founder: 3	Director: 3												
Director: 1	Division director: 2												
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Manager: 2													
Industries	<table border="0"> <tr> <td>Companies</td> <td>Institutions</td> </tr> <tr> <td>Hi-tech: 6</td> <td>Incubator: 1</td> </tr> <tr> <td>Manufacture of metal structures and parts: 1</td> <td>Centre of excellence: 2</td> </tr> <tr> <td></td> <td>Ministry: 2</td> </tr> <tr> <td></td> <td>Technology park: 1</td> </tr> <tr> <td></td> <td>Faculty: 1</td> </tr> </table>	Companies	Institutions	Hi-tech: 6	Incubator: 1	Manufacture of metal structures and parts: 1	Centre of excellence: 2		Ministry: 2		Technology park: 1		Faculty: 1
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Manufacture of metal structures and parts: 1	Centre of excellence: 2												
	Ministry: 2												
	Technology park: 1												
	Faculty: 1												
# of employees	<table border="0"> <tr> <td>Companies</td> <td>Institutions</td> </tr> <tr> <td>Less than 10: 1</td> <td>From 11 to 50: 4</td> </tr> <tr> <td>From 11 to 50: 4</td> <td>From 51 to 250: 1</td> </tr> <tr> <td>From 51 to 250: 1</td> <td>More than 250: 2</td> </tr> <tr> <td>More than 250: 1</td> <td></td> </tr> </table>	Companies	Institutions	Less than 10: 1	From 11 to 50: 4	From 11 to 50: 4	From 51 to 250: 1	From 51 to 250: 1	More than 250: 2	More than 250: 1			
Companies	Institutions												
Less than 10: 1	From 11 to 50: 4												
From 11 to 50: 4	From 51 to 250: 1												
From 51 to 250: 1	More than 250: 2												
More than 250: 1													
Average annual income	<table border="0"> <tr> <td>Companies</td> <td>Institutions</td> </tr> <tr> <td>Less than 2 million Euros: 3</td> <td>Less than 2 million Euros: 1</td> </tr> <tr> <td>From 2 to 8.8 million Euros: 1</td> <td>From 2 to 8.8 million Euros: 3</td> </tr> <tr> <td>From 8.8 to 35 million Euros: 1</td> <td>Not available: 3</td> </tr> <tr> <td>More than 35 million Euros: 2</td> <td></td> </tr> </table>	Companies	Institutions	Less than 2 million Euros: 3	Less than 2 million Euros: 1	From 2 to 8.8 million Euros: 1	From 2 to 8.8 million Euros: 3	From 8.8 to 35 million Euros: 1	Not available: 3	More than 35 million Euros: 2			
Companies	Institutions												
Less than 2 million Euros: 3	Less than 2 million Euros: 1												
From 2 to 8.8 million Euros: 1	From 2 to 8.8 million Euros: 3												
From 8.8 to 35 million Euros: 1	Not available: 3												
More than 35 million Euros: 2													

As mentioned, Rangus (2010) performed research by which she found out that majority of Slovenian companies, high-tech as well as low-tech, have not yet heard about the concept of open innovation, therefore we decided to interview only companies that innovate openly by cooperating with external partners since only such companies are competent enough to provide us valid conclusions. We interviewed one micro company (ISKRALAB d.o.o.), four small companies (C3M d.o.o., COSYLAB d.d., BIA SEPARATIONS d.o.o., Instrumentation Technologies, d.d.), one medium (Bisol d.o.o.) and one big company (Trimo d.d.).

The same year the survey made by Rašković and Pustovrh (2010) showed that most companies believe that supporting institutions of Slovenian business environment are dis-coordinated. When selecting representatives we chose two ministries (Ministry of the Economy and Ministry of Higher Education, Science and Technology), one educational institution (Faculty of Economics, Ljubljana (hereinafter FELU)), two bridging institutions (COBIK and EN-FIST) and two innovation support institutions (Technology park Ljubljana and Ljubljana University Incubator). We contacted also Public Agency for Technology of the Republic of Slovenia (TIA), Slovenian Research Agency (ARRS), Chamber of Commerce and Industry and Chamber of Craft and Small Business of Slovenia but unfortunately they did not respond or wish to participate.

By performing semi-structured interviews we managed to gather primary data. The focus of our qualitative research was on understanding the full multi-dimensional, dynamic picture of contextual variables of open innovation paradigm in the business environment of Slovenian companies. After gathering data we made a comparison between interviewees' opinions and thoughts.

5 EMPIRICAL FINDINGS

The main question that lies at the heart of research in open innovation field is how does openness influence firms' ability to innovate and appropriate benefits of innovation (Chesbrough, 2003; Helfat, 2006; Dahlandera & Gannb, 2010). The basic idea of openness is that a single organization cannot innovate in isolation but it has to connect with different partners to obtain ideas from external environment (Schumpeter, 1942; Hargadon and Sutton, 1997; Fleming, 2001; Chesbrough, 2003; Laursen and Salter, 2006; Dahlandera & Gannb, 2010). Therefore the goal of our interviews was to find out what companies on one side and governmental institutions on the other side think about the current Slovenian business environment and its support for open innovation.

After the interviews were transcribed we conducted the analyses of qualitative data by using NVivo software. The procedure was to run NVivo Word Frequency query to find out how often were the words open and innovation used in interviews. Among all words (beside conjunctions) they were the most often used, innovation on first place (179 times) and open on second (141 times).

Part of the advantages of innovating openly (compared to closed innovation) are according to interviewees access to external expertise and know-how, lower development costs and shorter development (and time to market) time, for example Interviewee 1 from Ministry of Higher Education, Science and Technology: *“I see the primary benefit in accessing external knowledge and stakeholders’ involvement with the purpose of achieving the development cycle as soon as possible”*. In addition, companies pointed out also the benefit of cohesion of skills, experiences, facilities and equipment, Interviewee 2 from Bisol said: *“Each company can not have the greatest experts from all fields and that is why it is necessary to open yourself and collaborate with external partners”*. Institutions’ representatives on the other side mentioned also interdisciplinary and higher product’s reputation.

The biggest threats of innovating openly companies and institutions see in poor legal protection (intellectual property rights), theft of know-how and ideas, unclear task distribution, misunderstandings, distrust and different goals. Interviewee 3 from Ministry of Economy: *“A lot of confidence, clear arrangements and task divisions are needed when innovating openly. I believe Slovenia is weak on these areas. Greater emphasis is needed on intellectual property rights and other legal provisions”*. Beside already mentioned disadvantages, companies pointed out also threat of unfair income distribution whereas institution saw potential problems with Not Invented Here syndrome.

Respondents believe that government has been doing much more in last few years than before in order to promote open innovation, but institutions are not connected enough with each other. Therefore, respondents suggested the following improvements in near future.

Change of Slovenian people’s mentality – Interviewee 4 from COBIK said: *“It is necessary to leave the existing patterns of thinking and behaving. Global environment is constantly changing and so should Slovenian environment, including the Slovenian people”*. Interviewee 5 from FELU corresponded: *“It is extremely important to create a culture of commitment to open innovations, to base the growth on all types of innovation (not just technology – innovation and open systems are often understood too narrow in Slovenia) and that every individual in the company is aware that only together with all stakeholders the company can create breakthroughs and future growth”*.

Decision on priority areas – Interviewee 6 from C3M: *“It is necessary to define priority areas on which Slovenia will focus in the future, since competitive advantage can only be achieved by specialization”*;

Supporting continuing education of employees – Interviewee 7 from Instrumentation technologies: *“Supporting continuing education, incentives for creating new jobs and R&D groups in companies”*;

Legislation improvement – intellectual property rights – Interviewee 8 from Trimo: *“It is necessary for Slovenia to have strong legal protection and improve intellectual property rights regimes”*;

Investments encouragement – Interviewee 9 from EN-FIST: *“Banks should offer more favorable bank loans; venture capital and other funding sources that encourage risky projects should be substantially increased”*;

More favorable tax policies – Interviewee 10 from IskraLAB: “*The government should change the overall tax legislation, which is currently very hostile to business*”, and Interviewee 11 from Cosylab: “*I see solution for open innovation support in lowering taxes on well-educated employees*”; and

Providing stable business environment – Interviewee 2 from Bisol: “*The main role of government is to provide stable business environment. The government should not directly interfere in economy*”. Interviewee 12 from BIA Separation agrees with him: “*Government should not interfere in economy, since such actions slow down the innovativeness. I believe that companies should have more open hands*”.

6. THE RESULTS

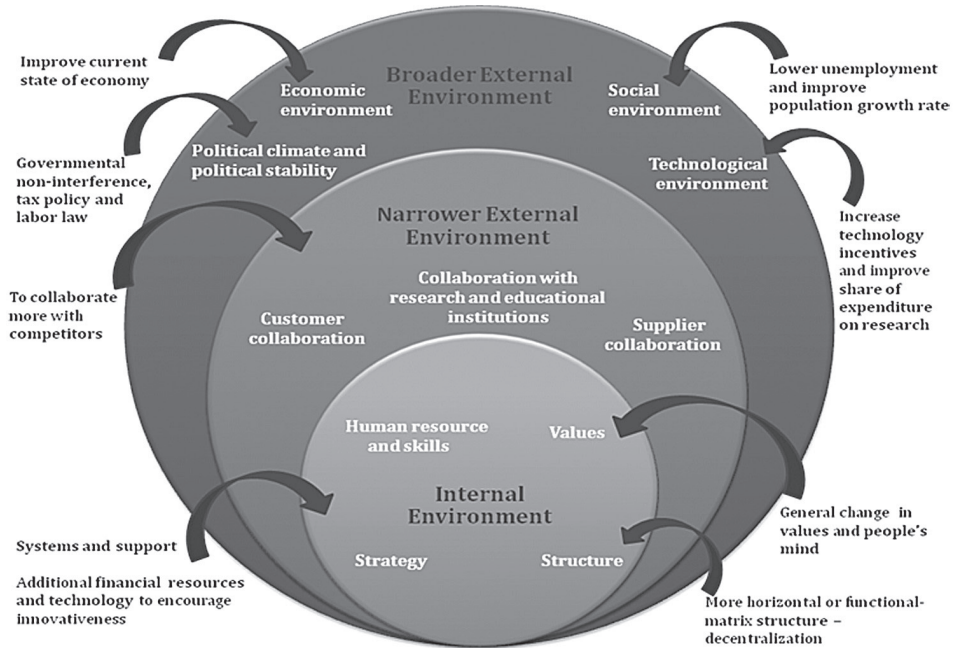
In this section, we provide a deeper insight into current situation in Slovenian business environment, how much support external and internal business environments in Slovenian companies provide for open innovation and how do companies on one side and institutions on the other side feel about it. We elaborate on which points they agree and what they see differently. As shown in Fig. 2 drawing on secondary data and qualitative information provided by the companies and institutions enabled us to construct the model of Slovenian business environment, what it is already offering and what needs to be improved for encouraging open innovation.

6.1 Internal business environment

First of all, the answers provided by interviewees indicate that our companies, especially small and medium, employ highly educated specialists. This implies that companies have strong R&D departments and that their human resources represent a stimulator for innovation and collaboration with external partners. What interviewees are missing in their companies (and in other Slovenian companies) is reward system and support, which will encourage employees to engage in innovative behavior. They all believe that some additional financial resources and newest technology would enable and encourage innovativeness and competitiveness.

In line with Child and Mansfield, (1972) smaller interviewed companies have in majority horizontal structure whereas bigger companies have functional-matrix structure. Such structures encourage communication, flow of ideas and innovation (Hinds & Kiesler, 1995). Interviewees believe that in order to be successful in open innovation on long-term, Slovenian companies need first to improve their internal business environment. Companies should possess values like creativity, innovativeness, confidentiality, trustworthiness and it should have established clear long-term strategy. Their companies in majority all enclose these elements, but unfortunately they believe that greater part of Slovenian companies still needs to improve and encounter their strategy and follow their values also in real life not just on paper.

Fig. 2: Contextual variables from Slovenian business environment that influence open innovation



6.2 Narrower external business environment

When trying to find out, which determinants influence narrower external environment we found out that interviewees believe in importance and benefits of open innovation. In accordance with Lawton, Dickson and Smith (1997) our interviewees mainly cooperate with customers and suppliers and they believe that customer collaboration addresses the importance of a two-way information flow between company's sales and product development. This integration of sales and service organizations with R&D department helps realize customer product and service requirements. Respondents believe that supplier collaboration does not only strengthen the relationship between supplier and company but it can also lead to much higher efficiency. In addition, interviewed companies claim that closer collaboration with suppliers results also in reducing the waste and/or poor value. What is more, the process of managing supply chain risk improved because the supplier and company together are able to better plan effectively for the future (Peterse- na, Handfield & Ragatz, 2005).

Interviewees see in collaboration with research and educational institutions big benefits since they can acquire more objective view. Companies are working with academia because as suggested by Barnes, Pashby and Gibbons (2002) such collaboration can advance the company toward achieving its goals. The main observation was that company-

academia collaboration often produces very interesting results like marketing analysis, proposed process, etc. What our correspondents are missing is stronger and more frequent collaboration on projects with companies that are competitors on other projects. According to Hamel, Doz and Prahalad (1989) such activity helps company to get to know competitors and establish stronger relationship with them.

6.3 Broader external business environment

In order to complete the picture of Slovenian business environment and its support for open innovation, the external business environment was also discussed with interviewees. An important finding is that it is necessary to establish more legal protection, especially on the field of private investments protection, intellectual property rights and information confidentiality. Results from our research regarding political and legal environment were in conjunction with findings of existing literature. As a big disadvantage companies pointed out especially high taxes on educated employees. What is more, OECD and IMF studies have shown that higher taxes on labor significantly increase unemployment (OECD, 2004; IMF, 2003). In Slovenia tax wedge on labor is composed of personal income tax (paid by employee), social security contributions (paid both by employer and employee) and payroll tax (paid by employer). Slovenian authorities also perceive the tax burden and contributions as too high and the overall tax burden is relatively high by international comparison (OECD, 2011). Therefore government should lower taxes and change labor legislation. In order to remain competitive, Slovenia needs more flexibility on currently rigid markets of work force. However, Slovenian government has supported already more than 3500 companies' projects – more than 565 million Euros were invested in 2009 and 2010, and two of these projects are designed to promote open innovation. First are centres of excellence in which seven to twenty-two high technology companies, research institutions and universities participate and second important project are competence centres for the period 2010-2013.

Due to the current financial crisis, the economic environment is not as favorable as it was three years ago, when the growth rate was accelerating (Filippetti & Archibugi, 2011). This has influenced interviewed companies and as result they all started to look for new paths to grow – three companies are a part of Centre of excellence for Biosensors, Instrumentation and Process Control and one company has had the chance to grow due to the governmental subsidy in renewable sources of energy. Other companies are developing new products, searching for new markets and new collaborations with external partners. Interviewees pointed out the necessity for improvement in economic growth and consequentially also the current state of economy will improve. The current financial crisis has changed the business world and also Slovenia should adapt and plan more steady and sustainable growth in the future where banks will need to rely more on domestic financing. Governments have already been trying to improve economy by lowering interest rates since lower rates make borrowing cheaper and encourage economic expansion.

The financial crisis has not affected only economic environment but it has had a huge influence also on social environment. The current unemployment rate in Slovenia is one of the highest in the last decade (Eurostat, 2012). Many employees, from highly educated with PhDs to those without any education, have lost their jobs. Interviewed companies are still growing due to their flexibility and strong position on the market. Another element that is very favorable for Slovenian hi-tech companies is the fact that educational structure of the adult population has been improving in the last decade (Eurostat, 2012). This means that career attitudes are changing and people are investing more in their education. Therefore, Slovenian companies can find their employees here on domestic labor market, which leads also to lower costs. What causes more concerns, especially in the past months with referendum on pension policy, is the trend of Slovenian population growth rate. Slovenia still has negative rate of natural increase, and with our Pay As You Go pension system this will create unsustainable financial situation. Nevertheless, in comparison with other EU members, Slovenia is among the countries with the lowest risk of poverty, due to the social benefits and Slovenia is at the top of countries with the lowest income inequality.

The interviewees agree with Mowery and Rosenberg (1989) that technological development strongly influences country's economic strength. It has become quite obvious and it needs to be taken into account that technological lag reflects in multiyear lag on the economic level. As a result, in few next years, shift in demanding and high-tech products and services in Slovenia is highly needed or we will face even stronger economic slowdown and the resulting economic collapse. It should be noted that the business friendly environment does not capture only the amount of funds allocated for R&D, but it is the sum of all factors that affect technological development.

7 DISCUSSION

Companies respond to their business environment to exploit opportunities or to react to perceived threats (Andrews 1987). Institutional theory deals with choices made in response to or an organization's institutional environment (Bluedorn et al., 1994) and it considers the processes by which structures, including rules, norms, and routines, become established and consistent with the institution's rituals under environmental pressures (Scott, 2004). Open innovation represents cooperation with external partners in order to boost innovation, including R&D, resources, marketing and production. According to Freeman and Soete (1997) external relationships with academic, research institutions and other partners benefit companies' innovation because they can strengthen their technological competences and it broadens their knowledge and know-how.

We began this paper with the observation that in spite of the growing literature on open innovation, there is a lack of empirical studies in general, as well as specifically on business environment's support for open innovation. Our paper addresses this gap by exploring support of Slovenian business environment for open innovation. One of the major objectives of the research was to obtain the data from theoretical base and backing it up

by in-depth semi-structured interviews in order to define the elements of Slovenian business environment regarding its stimulators and inhibitors of open innovation.

Drawing on previous work and our study we can conclude that Slovenia has been forming support mechanisms to create friendlier business environment for open innovation. However, if Slovenia wants to be successful on long-term, supportive business environment cannot and should not be formulated just with governmental financial support but it should consist also of other factors that influence technological development, meaning: 1) corporate culture, value and reward system, 2) legislation and juridical country, 3) tax system and burden of social contributions, 4) bureaucratic barriers, 5) human resources 6) infrastructure, cost of land, and 7) funding opportunities (favorable bank loans, bank guarantees, venture capital, etc.).

The biggest benefit we see in unburdening knowledge and innovation by lowering taxes on highly educated employees. This will consequentially lead to smart specialization. If the government decides to retain high taxes it should at least compensate this by higher incentives, improved infrastructure (more supporting institutions and research projects), more favorable bank loans, true venture capital (not like the one it is offered today on Slovenian market) and all other measures that could create more friendly business environment.

7.1 Implications

As the open innovation paradigm highlights, company can and should use internal and external ideas to drive revenue (Chesbrough, 2003) and those that innovate openly have access to external facilities and equipment. Open innovation enables companies to respond more flexible to new technologies and to access external experts. In this subsection we elaborate on the implications for managers and policy makers.

With our research we tried to define the current condition of Slovenian business environment and how favorable it is to open innovation. In answers provided by interviewees we learned that they employ highly educated experts and have strong R&D departments. This has important implications for managers striving for success since interviewees believe there is still some space to improve and companies could invest more in continuing education of employees. Next, interviewees believe that majority of Slovenian companies are missing a reward system and support that will encourage employees to engage in more innovative behavior. Rewarding the employees is perhaps the most powerful tool a manager can use in changing the current internal business environment to a new one, the one that will support creativity and open innovation.

Slovenian companies cooperate mostly with customers and suppliers. Companies in different industries are using different approaches to incorporate customer input into product development. In the case of our respondents, key suppliers are a part of the decision-making process. This enables companies to keep suppliers on track and it helps

to resolve possible supply chain issues. Suppliers have become a kind of extension of the company. Collaboration with competitors is the least developed cooperation in Slovenia. Sharing between competitive companies is a smart strategy as long as the relationship will benefit both parties without compromising each of the firm's competitive position in the industry. In contrast to the existing literature (Bučar et al., 2010), which claims that cooperation between companies and institutions is the least dynamic area of collaboration, our respondents specifically pointed out different ways of collaborating with research and educational institutions. Universities are very attractive partners for business since high-quality academic researchers operate in international networks and they know what is going on in their field around the world. In addition, their big advantage is that research teams are constantly being revitalized by the arrival of possibly even brighter new staff.

Another relatively straightforward implication of our research findings is that Slovenian government accepted a series of measures in order to strengthen the development activities of Slovenian companies, which focus especially on strengthening the business environment with key objectives for companies to remain competitive even after the current crisis. In line with OECD (2011) our interviewees claim that policies, which stimulate innovation, labor market flexibility and friendlier business environment would be helpful. Nevertheless, we should keep in mind that last year, Slovenia suffered the biggest drop within the IMD World Competitiveness Yearbook surveyed countries (IMD, 2010).

And finally, positive trend can be seen also in technological environment, where the share of expenditure on research is increasing but unfortunately it is still far too low. Various studies on competitiveness of Slovenian economy in the last decade have shown that in technological context, Slovenia has regressed. If no action will be taken in the next few years, the most vital parts of the Slovenian economy will find themselves in a situation where textile industry is today (Štrancar, 2005). The government is trying to improve this by establishing supporting institutions and by increasing aid to small and medium enterprises. Interviewed companies are great example of innovating companies and they are all aware of the importance of external collaboration.

7.2 Limitations

The current study is a first exploration of the business environment and its support for open innovation practices. Consequently, it has some limitations. We identified three major limitations. First, the main restrictions of the paper are mainly in the content since open innovation is quite new research area and there is still huge knowledge gap in this field. Most of the reviewed literature is from the period of last five years and as a consequence there is still no unique conclusive definition of research constructs. When formulating our research model we compared and integrated the most frequent and reasonably represented authors' believes. This enabled us to focus on the construct that in our opinion (based on a detailed review of the existing literature) includes the

most comprehensive model of contextual variables of open innovation in the business environment of Slovenian companies.

There are only few Slovenian companies that innovate openly (Rangus, 2010) so difficulty of measuring open innovation in Slovenian business environment imposes methodological limitation. In our research, we therefore included only companies that collaborate with external partners. We believe it is necessary to take into account possible biased responding of interviewees as they might want to appear better and more open as they are in reality. By giving them all the chance of anonymity we believe we limited this possibility to the highest possible level and our conclusions should truthfully represent what is current situation and how strong is support for open innovation in Slovenian business environment.

And finally, the measurement instrument includes some limitations and shortcomings, like quite small sample and as a consequence, we cannot claim that our data capture the full domain of Slovenian business environment and its support for open innovation. The validation of research findings is currently limited to qualitative assessment. In order to be able to transmit my research findings on wider geographic area a proposition needs to be tested through quantitative research, for example a multi-level analysis could be carried out using Hierarchical Linear Modeling (HLMs).

7.3 Suggestions for further research

Researchers should in our opinion include a variety of research designs and not only follow academics, who were the first to introduce this term. There is still huge knowledge gap in this field, so for future research we recommend the testing of our model on wider geographic area, European or even worldwide. For higher validity of our research findings, we would recommend to test our model not only in more countries but also on bigger sample – more companies and institutions. Only then we can discuss the generalization of results.

Our next recommendation for future research is to examine how to improve the trust of Slovenian companies in external partners and how to encourage also collaboration with competitors. We believe the impact of organizational climate and culture and other elements of internal business environment should be examined more in detail. The impact of internal business environment on the attitude towards open innovation could also be empirically determined. More closely examined impact of the internal business environment on open innovation is essential for a comprehensive understanding of relationships within the organization and factors that influence its performance.

In order to define the elements of business environment that influence open innovation, it would be interesting to explore how to provide better juridical protection, including better intellectual property rights protection and how to evaluate patents, since according to Gassmann, Enkel and Chesbrough (2010) this is quite problematic, as most patent

transactions are not reported publicly. Given that one of the elements of the supportive business environment for open innovation is also more favorable tax policy, it would be prudent to objectively explore what are the best ways of lowering the tax burden on highly educated employees in Slovenia in order to promote open innovation.

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