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MODEL OTVORENIH INOVACIJA U KOMPANIJAMA U REPUBLICI SRBIJI

OPEN INNOVATION MODEL IN SERBIAN COMPANIES

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Rezime: *Cilj ovog rada je da ukaže na trenutnu spremnost poslovnog sektora u Srbiji da posluje u skladu sa glavnim principima Modela otvorenih inovacija. U radu je prikazan teorijski okvir Modela otvorenih inovacija i predstavljeno trenutno stanje i relativna pozicija Srbije u odnosu na članice EU u pogledu zastupljenosti prakse upotrebe Modela otvorenih inovacija. Istraživanje je pokazalo da Model otvorenih inovacija nije preovlađujući poslovni model u poslovnom sektoru Srbije. Sa druge strane, osim u nekoliko država, kod većine EU članica ovaj poslovni model takođe nije u velikoj meri prisutan.*

Ključne reči: *Model otvorenih inovacija, Poslovni sektor, Srbija.*

Abstract: *The aim of this paper is to indicate the current willingness of the business sector in Serbia to operate in accordance with the main principles of the Open Innovation Model (OIM). The paper presents theoretical framework of the OIM and shows the current situation and the relative position of Serbia in relation to the EU member states regarding the prevalence of the practice of using the OIM. This research showed that the OIM is not the predominant business model in the Serbian business sector. On the other hand, except in a few countries, this business model is also largely absent in most EU member states.*

Keywords: *Open Innovation Model, Business sector, Serbia.*

1. INTRODUCTION

The linear model of innovation was one of the first theoretical frameworks developed in order to understand science and technology and their connection with the economy. According to this model, the process of creating innovation begins with the basic research, followed by applied research and development, and ends with production and diffusion (Godin, 2006). However, the linear model of innovation has suffered an enormous number of criticisms to the extent that it is difficult to read research work in the field of science, research and innovation that does not state that the linear model of innovation is a "wrong" model. The most common criticisms of linear models are going into two directions: limited application in different industries and the lack of feedback at different stages of the innovation process.

The first concrete alternative to linear models of innovation is the chain model of innovation presented by Klein and Rosenberg (1986). The chain model of innovation emphasized the importance of accumulated knowledge and cooperation in the process of creating new knowledge.

The dynamic development of science and technology emphasised in the last three decades, the widespread use of ICT, pronounced importance of labour mobility as well as changes in habits, needs and desires of consumers influenced the emergence of a modern business model based on openness and cooperation. The new, so-called Open Innovation Model involves a process of intensive exchange of ideas, knowledge, resources and technology between companies.

Recent studies conducted in Serbia have shown a very low level of innovation activities within SME sector (Prljić et al. 2016) and lack of patenting culture (Kutlača et al. 2020). Serbian companies are mainly focused on purchasing already developed machinery and they pay very little attention on technology transfer processes. The share of turnover from sales of unchanged or marginally modified products is dominant (Štrbac & Kutlača, 2018).

This paper provides the current state of the business sector in Serbia with regards to operate in accordance with the main principles of the OIM. The paper is organized in the following way. First, we present the theoretical aspects of OIM. Then, we present the research design and the main results. We conclude with the key characteristics of OIM in Serbian business sector with implications for the future research.

2. THE CONCEPT OF OPEN INNOVATION

The OIM was originally introduced in 2003 by British researcher Chesbrough (2003). In the years following the introduction of this model, it was cited and adapted by a large number of researchers, but also applied by a large number of companies. The open innovation paradigm is the antithesis of traditional models of vertical integration (closed innovation models) according to which internal innovation activities lead to innovations of products and services placed on the market. The concept of open innovation is a response to a modern approach to business that is based on intensive cooperation and engagement of a wider number of stakeholders in the process of developing innovation.

This model implies that the innovation capabilities of organizations are not limited within the boundaries of the organization, but imply active cooperation with suppliers, customers, business partners, third parties and the general community as a whole. The role of universities is becoming increasingly important, as public policies increasingly adapt to this concept (Chesbrough, 2012).

The new way of doing business emphasises cooperation through the establishment of various forms of strategic partnerships and other forms of business cooperation. Networking becomes an important factor for enterprise development in most high-tech industries (Enkel et al., 2009). A key feature of the OIM is the company's openness to the external environment. According to this model, in order to introduce innovations, firms should use both internal and external ideas for innovation as well as internal and external ways of launching innovations into the market.

Important factors for the successful functioning of the OIM according to Chesbrough (2003) are:

- Employee mobility.
- Existence of internal R&D.
- Protection of intellectual property.

Employee mobility is an important prerequisite for a successful concept of open innovation due to the fact that employees have the opportunity to present their own ideas outside the work environment as well as for the company to be open to new people. In order for the transfer of technology and knowledge to function efficiently, it is necessary to have internal Research and Development (R&D). The protection of intellectual property is the third important factor, especially in the case of the need to attract significant capital investments.

3. RESEARCH METHODOLOGY

In this article, we shed some light on the business model of enterprises from Serbia by looking at the level of cooperation and openness to other business entities in conducting R&D and innovation activities. For this purpose, we use the data available from the Community Innovation Survey (CIS) conducted in 2018 by the Statistical Office of the Republic of Serbia. For international comparison, Eurostat data were used.

In order to examine the current state of business sector in Serbia regarding their ability to operate in accordance with the main principles of the OIM, we analysed the following indicators:

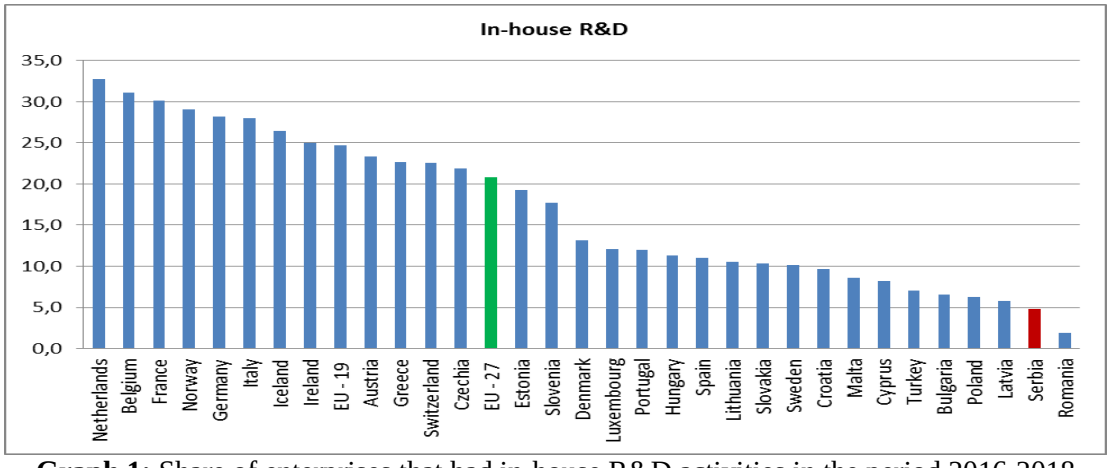
- R&D in-house activities
- R&D contracted out activities
- Cooperation on R&D activities
- Cooperation on innovation activities
- Sold IP rights
- Licenced-out IP rights
- Purchased or Licenced-in IP rights

Although it does not represent a complete list of possible indicators for the evaluation of the OIM, we believe that the analysis of these indicators provides valuable insights into the current state of the business sector in Serbia. It shows the level of exchanges of information with actors outside of the boundaries of an organization, aimed at integrating their resources and knowledge into the organization's own innovative process.

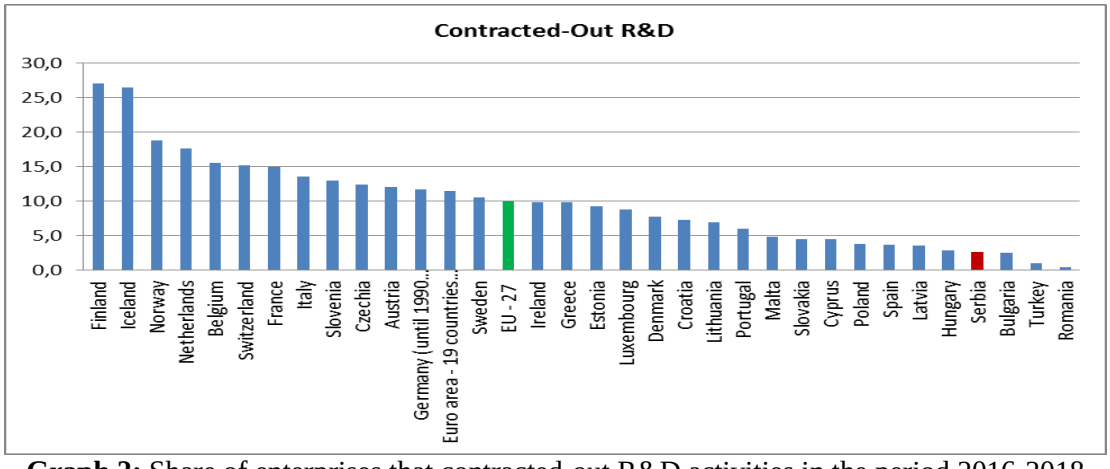
4. RESEARCH RESULTS AND DISCUSSION

The total share of innovative companies in Serbia is 50.2%. According to this indicator, Serbia is close to the EU27 average (50.3%). An important factor, when it comes to innovation, is the size of the enterprise. Large enterprises are more innovative than small and medium enterprises. The total share of large enterprises that are innovative is 69.1%, while 61.8% of medium-sized enterprises and only 47.6% of small enterprises are innovative. Manufacturing sectors are more innovative (56.6%) than services (47.9%).

When it comes to R&D activities, an extremely low share of enterprises from Serbia is investing in R&D. Only 4.8% of enterprises had in-house R&D activities, while 2.7% of enterprises contracted-out R&D to other enterprises or to public or private research organizations in the period 2016-2018. As regards this indicator, Serbia lags behind most EU countries (Graphs 1 and 2).

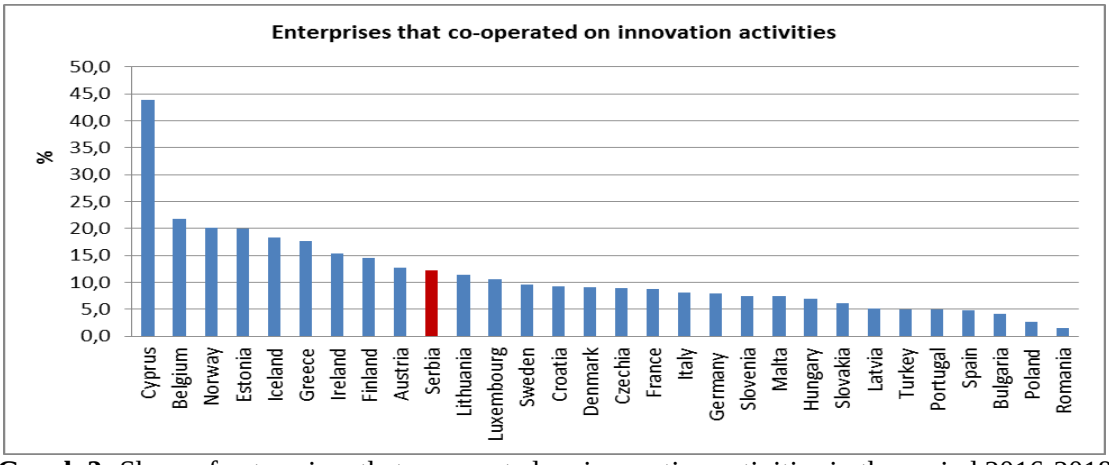


Graph 1: Share of enterprises that had in-house R&D activities in the period 2016-2018 (Source: Authors' calculations based on National CIS and Eurostat data)



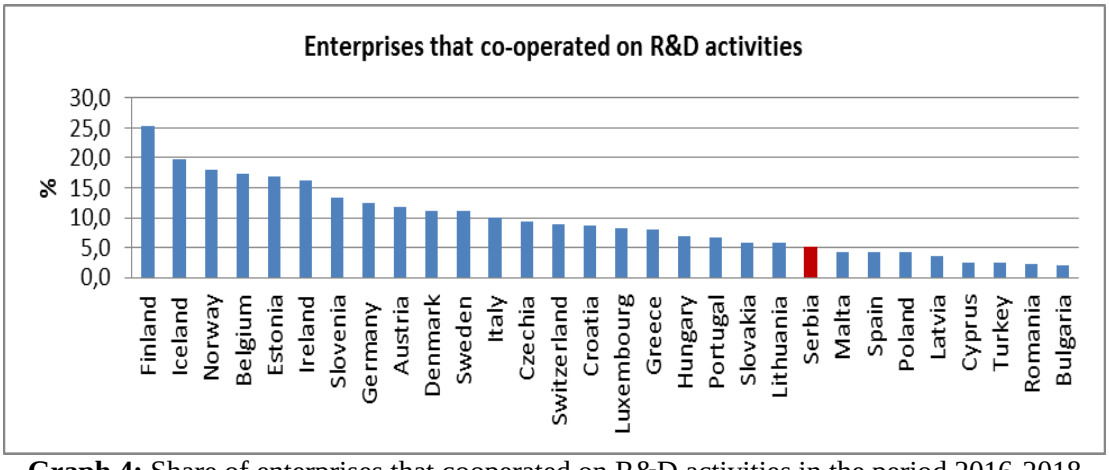
Graph 2: Share of enterprises that contracted-out R&D activities in the period 2016-2018 (Source: Authors' calculations based on National CIS and Eurostat data)

The business sector in Serbia has good results in realizing innovative activities that do not involve R&D. According to the share of companies cooperating with other entities on innovative activities, Serbia ranks 10th out of 30 EU member states and associated countries (Graph 3). Cooperation on innovative activities is mostly realized through a vertical chain of cooperation, i.e. with suppliers and clients or customers. Horizontal cooperation, which implies cooperation with competitors and the research sector, is less represented.



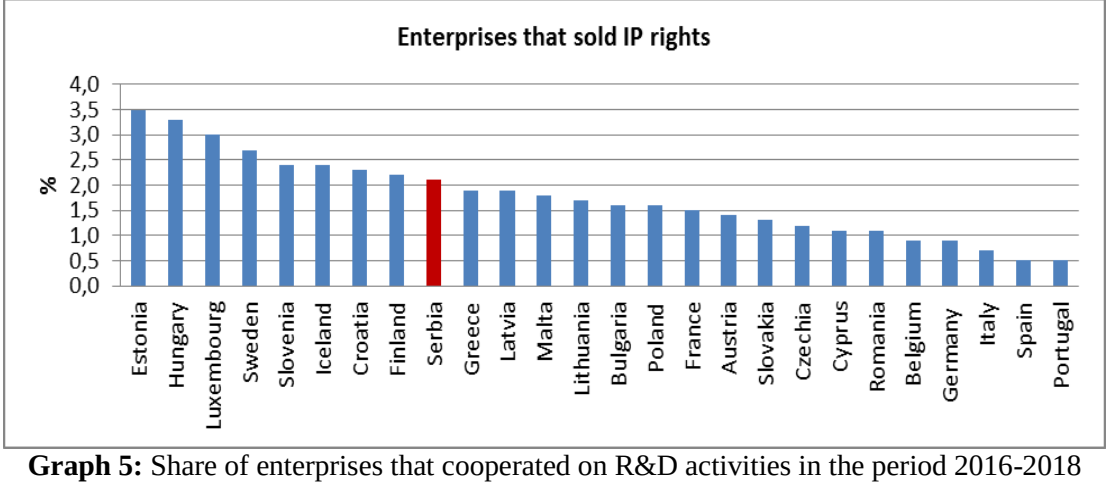
Graph 3: Share of enterprises that cooperated on innovation activities in the period 2016-2018 (Source: Authors' calculations based on National CIS and Eurostat data)

Given that the business sector from Serbia is recording very low investments in R&D activities, it was expected that the cooperation on R&D activities is weak. According to this indicator, Serbia ranks 22nd out of 30 EU members and associated countries (Graph 4).



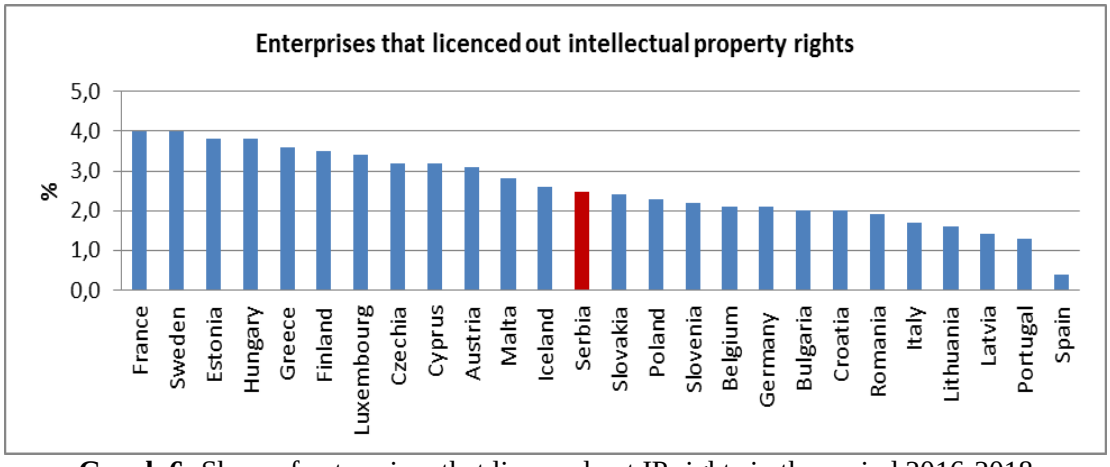
Graph 4: Share of enterprises that cooperated on R&D activities in the period 2016-2018 (Source: Authors' calculations based on National CIS and Eurostat data)

Managing IP rights in accordance with the model of open innovation implies openness and cooperation in the creation of IP as well as opening opportunities for licensing IP rights and technology transfer. Only 2.1% of companies in Serbia sold IP rights to other entities in the period 2016-2018. However, the situation in more developed European countries is not much better. According to this indicator, Serbia is on the high 9th place out of 26 European countries (Graph 5).



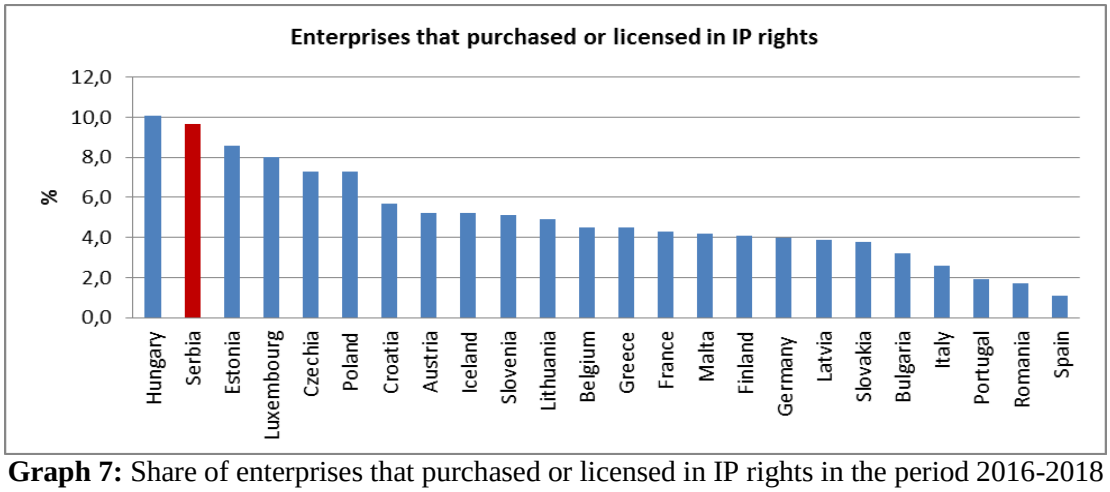
Graph 5: Share of enterprises that cooperated on R&D activities in the period 2016-2018 (Source: Authors' calculations based on National CIS and Eurostat data)

In addition to selling IP rights, the more common practice of the business sector is licensing out IP rights. This practice is based on a business arrangement in which one company gives another company permission to manufacture its product for a specified payment. According to the statistics related to the period 2016-2018, around 2.5% of the enterprises from Serbia managed to licence out their IP rights. Graph 6 shows that other EU member states are more prone to lincense out than to sell IP rights.



Graph 6: Share of enterprises that licenced out IP rights in the period 2016-2018
(Source: Authors' calculations based on National CIS and Eurostat data)

The enterprises from Serbia are more oriented toward licensing in or purchasing IP rights than to selling their own IP rights. In total 9.7% of enterprises have been engaged in licensing in technologies from other entities i.e. the owners of IP rights. Comparing this trend with EU member states, it can be concluded that after Hungary, Serbia is a leader in the appropriation and absorption of technologies and IP rights (Graph 7).



Graph 7: Share of enterprises that purchased or licensed in IP rights in the period 2016-2018
(Source: Authors' calculations based on National CIS and Eurostat data)

5. CONCLUSION

This paper provides an insight into the current position of Serbia in relation to the EU member states with regards to doing business according to the key principles of the OIM. The paper presents a limited number of indicators that show the practices of companies in innovative activities and degree of cooperation in the process of managing innovations. Although limited, these indicators undoubtedly indicate the basic principles of the OIM.

More than half of the enterprises from Serbia are innovative, which means that they are engaged in innovative activities resulting in new or improved products/services or processes. On the other side, engagement in R&D activities is poor. Although innovation does not necessarily involve R&D activities, it is evident from an international perspective that the business sector from Serbia is at the bottom of Europe in

R&D activities. However, the cooperation on innovative activities (excluding R&D) is relatively high. According to this indicator, Serbia is performing better than half of the EU member states.

Due to limited technological and innovative capacities, it is evident that companies in Serbia are oriented towards the adoption and diffusion of new technology rather than selling or licensing out their own IP rights. Such indicators are expected and are in line with the current level of development of the Serbian economy.

With regards to the current state of enterprises from Serbia in using the OIM, it is evident that this business model is not represented in the Serbian economy. Furthermore, it can be seen that most European countries have not adopted this business model too. In general, a very low percentage of companies in the European Union cooperates on innovation and R&D activities with other entities. When it comes to the flow of IP rights, these indicators are even worse.

This research has certain limitations mostly related to the research approach. Quantitative indicators are observed, while qualitative indicators are not considered. In the future research, it would be interesting to make a qualitative analysis of business models in Serbia in order to determine specific circumstances, needs, opportunities and other relevant factors for the application of the OIM.

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