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Innovativeness of Small and Medium-Sized Enterprises in the Republic of Serbia and Countries of the European Union

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Abstract: The paper provides a comparative analysis of the results of innovation activities in enterprises of different size from EU member and candidate states during the period 2008-2010. Particularly, the paper considers position of Serbia compared to the EU average and average of some neighboring countries (Hungary, Slovenia, Croatia, Romania and Bulgaria). The results confirmed the existence of a high correlation between size of enterprise and its innovation activities. The percentage of innovation activities in large enterprises is higher than in small enterprises. Serbia is lagging behind the EU average, regarding innovativeness level in all types of enterprises (classified by size). However, when Serbia is compared to neighboring countries, the situation is much different. Small enterprises from Serbia are more innovative than small enterprises from neighboring countries. The situation is similar in medium-sized enterprises. Large enterprises from Serbia are more innovative than enterprises from Bulgaria, Hungary and Romania, and less innovative than large enterprises from Slovenia and Croatia.

Keywords: innovation, innovativeness, SMEs, Serbia, EU.

JEL classification: E60,O30

INTRODUCTION

Innovations are the basis for developing knowledge-based economy and they are crucial for the growth and survival of an enterprise (Acs, de Groot & Nijkamp, 2013). Knowledge-based economies are characterized by creation, diffusion and utilization of knowledge and innovations (Despotovic, Cvetanović & Nedić, 2014). Creation, exchange and successful commercialization of knowledge through innovation are sources of productivity growth, value added, competitiveness, economic growth, job creation and well-being in every society. Innovations are crucial because of their significant impact on all aspects of knowledge-based economy (Johannessen & Olsen, 2010; Cvetanović & Despotovic, 2014).

New knowledge enables development of innovation (new products, services, processes, etc.); in turn, innovations (as the most important source of change) enable development of knowledge-based economy. Knowledge-based activities stimulate innovation (Pérez-Luño et al., 2011). The relationship between knowledge, innovation and dynamic economy is complex and inter dependent because: knowledge is the main source of innovation; innovations change and build society; and the very nature of innovation changes in the knowledge-based economy (Zhou, & Li, 2012; Cvetanović, Despotović & Nedić, 2012; Filipović, Nikolić & Ilić, 2015). Although not all innovations arise only as a result of R&D activities, knowledge is the most important factor for development of innovation. Knowledge-based societies enable an efficient exchange of knowledge between scientific research institutions and enterprises and so provide a favorable environment for creation of new knowledge and development and commercialization of innovations (Quintane et al., 2011).

Economic theory pays considerable attention to innovation since differences in innovativeness significantly determine the level of development and opportunities for growth and development of an enterprise, economy and society as a whole. Only economies with numerous innovation-oriented enterprises that efficiently realize their innovative ideas can provide high employment and income and create environment for future sustainable economic growth (Cvetanović et al., 2015). Innovative small and medium-sized enterprises (SMEs) are very important in the mod-

ern knowledge-based economy. Innovative SMEs are the most important source of competitiveness, new employment and economic growth. These enterprises are the most dynamic, the most flexible and the most efficient part of the economy and they form the basis for economic development. (Pokrajac, 2010; Nedic et al., 2015).

SMEs are driving force of modern economies because of their multiple contributions to technological innovation, employment, increasing export, dynamizing competition, etc. (Oksanen & Rilla, 2009). Their innovative ability is of great importance because innovations provide competitive advantage for an enterprise, the industry, and the economy as a whole (Filipović, Nikolić & Cvetanović, 2015). New and existing innovative SMEs contribute to overall productivity and competitiveness of the economy by squeezing out less productive enterprises. Innovation is a powerful tool for new small enterprises to successfully enter a market and change current situation. Also innovation enables existing enterprises to maintain or improve their market positions. Innovative SMEs participate in the knowledge flow within the innovation systems, not only as passive users of knowledge but increasingly as a significant source of knowledge (Van de Vrande et al., 2009).

Globalization and development of knowledge-based economy have facilitated access to knowledge and enable development of non-technological and social innovations. Changes in the business environment (revenue growth, increase in the number of market niches, change in technology and development of open innovation) reduced the structural shortcomings of SMEs arising from their limited opportunities for achieving economies of scale, which in turn increased the importance of new and small enterprises in the innovation process. Innovative SMEs have become the most important development potential of the modern economy. However, due to the surroundings where they operate, i.e. insufficiently stimulative business environment that is not sufficiently adjusted to the development requirements of innovative SMEs, many SMEs do not recognize the importance of developing innovations, or do not satisfy the necessary conditions for realizing their full potential to innovate.

Innovative SMEs are faced with numerous problems and barriers, especially in terms of financing, availability of research institutions' activity results, access to international market, administrative barriers, opportunities of hiring qualified personnel, etc. All these issues create a need for a systematic, well-designed policies and specific programs of support which should enable SMEs to utilize their development and innovation potentials.

Also, there is unequal distribution of innovations within the SMEs sector between a small number of highly innovative SMEs with high growth potential and a large number of SMEs that are not innovation-oriented and have very low innovation potential. Therefore, policy aimed at stimulating innovation should make a clear distinction between these two groups of SMEs, and should understand and take into account differences in their business environments, their methods and motives for innovation.

In the EU, innovation is viewed as the most important factor in maintaining and improving competitiveness, creating new jobs and improving the quality of life (Kaufmann, Tsangar & Vrontis, 2012; Tilford & Whyte, 2010). Therefore, encouraging innovation, by stimulating and improving the drivers of innovation activities (primarily, innovative SMEs), is one of the most important goals of European development policy (Lundvall & Rodrigues, 2002; Lundvall & Lorenz, 2012).

The paper will explore: 1) statistical monitoring of innovation for the purposes of Eurostat i.e., the European Commission, which is based on survey of innovation activity in enterprises (CIS), 2) proportion of innovative enterprises (% of all enterprises) in the analyzed economies and 3) type of realization of innovation activities (independently, based on their own knowledge and resources or in cooperation with other enterprises within the group, suppliers, customers, faculties and universities, private and public research institutes, specialized research organizations).

STATISTICAL MONITORING OF INNOVATION FOR THE PURPOSES OF EUROSTAT

For the purpose of monitoring innovativeness at the EU level, Eurostat and relevant statistical organizations in the EU member states collect data on innovation in the EU in order to satisfy the needs of development policy makers and the scientific community. Data obtained enable decision-making about the need for and methods of helping and encouraging innovativeness. These data also help in creating various initiatives and programs such as Innovation Union and European Research Area in the context of the EU development strategy named Europe 2020.

Statistical monitoring of innovation for the purposes of Eurostat i.e. the European Commission is based

on survey of innovation activity in enterprises (CIS)[1], which is conducted in all EU member states and candidate states (Iceland, Serbia and Turkey) and Norway. This survey statistically monitors the activity in enterprises in terms of products/services innovation, process innovation, organizational innovation and marketing innovation. The legal basis for conducting survey and collecting data on innovation activity in enterprises is Regulation 1450/2004 of 13 August 2004 (1608/2003/EC) concerning the production and development of Community statistics on innovation.

In the survey research of innovation activity in enterprises ad hoc modules are developed, focusing on internal and external skills and methods to stimulate new ideas and creativity. The results emphasize the differences between innovative and non-innovative enterprises. In addition, the survey provides information on enterprises that acquire specific knowledge from the environment, as well as information on enterprises that rely heavily on internal capacities (e.g., in areas such as multimedia, web design, market research, mathematics, etc.). Data obtained also show which methods are considered as successful for encouraging creativity: brainstorming sessions, multidisciplinary and/or cross-functional work teams, training, job rotation or financial and non-financial incentives to motivate employees, etc.

Survey of innovation activity in enterprises, which is conducted for the Eurostat's purposes, also contains data on innovativeness of enterprises in Serbia. So the paper will provide a comparative overview of the results of innovation activities in enterprises in the EU member states and candidate states (including Serbia) by multiple aspects of innovativeness, using the latest available data for reporting period 2008-2010. The great deal of attention is paid to the position of Serbia compared to the EU average and some neighboring countries (Hungary, Slovenia, Croatia, Romania and Bulgaria).

The total number of enterprises surveyed in all EU-27 states is 730,700, with the highest coverage in Germany (127,073 enterprises), Italy (118,567) and Spain (75,468) and the lowest in Malta (727), Cyprus (1,405) and Luxembourg (1,509). Although the structure is not the same in every country, most enterprises surveyed (from 93.1% in Slovakia to 98.0% in Italy) are SMEs. The survey covers enterprises from basic NACE activities related to innovation activities (Mining and quarrying – B, Manufacturing – C, Electricity, gas, steam and air conditioning supply – D, Water supply; sewerage, waste management and remediation activities – E, Wholesale trade, except of motor vehicles and motorcycles – G46, Transportation and storage – H, Publishing activities – J58, Telecommunications – J61, Computer programming, consultancy and related activities – J62, Information service activities – J63, Financial and insurance activities – K, and Architectural and engineering activities; technical testing and analysis – M71).

EXTENT OF INNOVATION

Among the EU member states, the highest shares of innovative enterprises in 2010 are observed in Germany (79.3 % of all enterprises), Luxembourg (68.1 %) and Belgium (60.9 %); in more than half of the EU-27 states, the share of innovative enterprises in the total number of analyzed enterprises is over 50% (the average is 52.9%)[2]. The lowest shares of innovative enterprises in the total number of enterprises are observed in Bulgaria (27.1%), Poland (28.1%) and Latvia (29.9%).

Regarding the proportion of innovative enterprises, Serbia (51.7%) is close to the European average (52.9%) and is above all observed neighboring countries (Bulgaria 27.1%, Romania 30.8%, Hungary 31.1%, Croatia 42.4% and Slovenia 49.4%) (Figure 1).

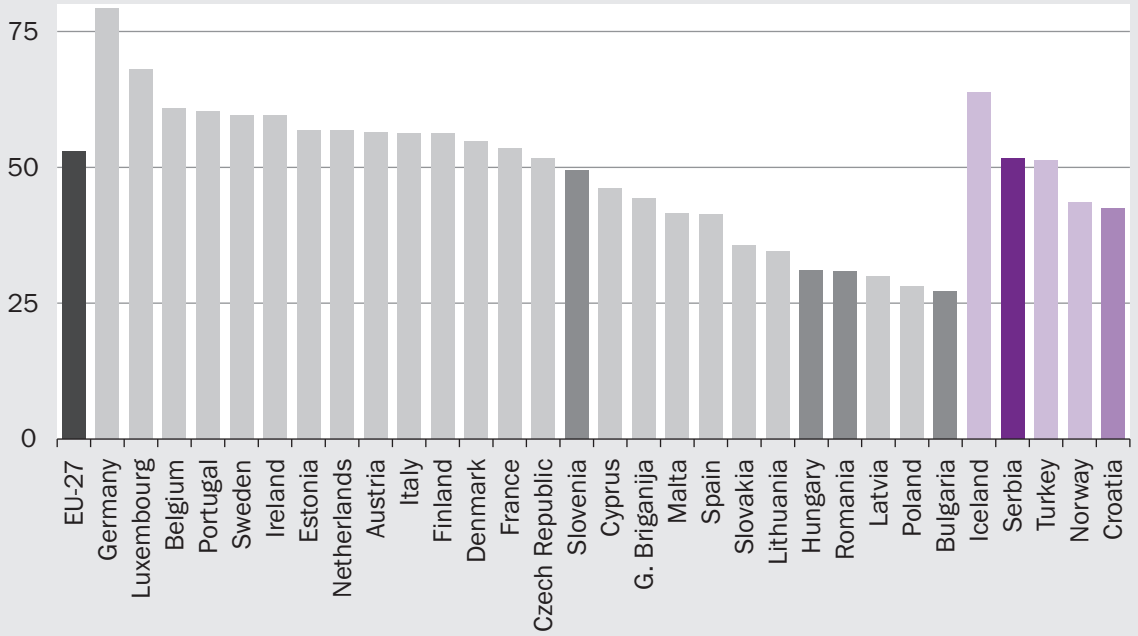
Enterprise size analysis shows that there is a high correlation between size of enterprise and its innovation activities. The percentage of innovation activities in large enterprises is higher than in small enterprises; as a rule, enterprise-size growth increases proportion of innovative enterprises. This applies to all European countries observed, as well as Serbia.

Serbia is lagging behind the EU-27 average, regarding innovativeness level in all types of enterprises classified by size (small, medium-sized and large enterprises). However, when Serbia is compared to neighboring countries, the situation is much different (Figure 2). Small enterprises in Serbia are more innovative than small enterprises in all neighboring countries observed (Bulgaria, Hungary, Romania and Slovenia). The situation is similar in medium-sized enterprises, because medium-sized enterprises in Serbia are more innovation-oriented than medium-sized enterprises in all neighboring countries observed (excluding Slovenia). The situation is somewhat different

[1] The Community Innovation Survey

[2] With the exception of Greece, in 14 out of 26 European countries observed, innovative enterprises are dominant in the economy; in remaining 12 countries, proportion of innovative enterprises is under 50%.

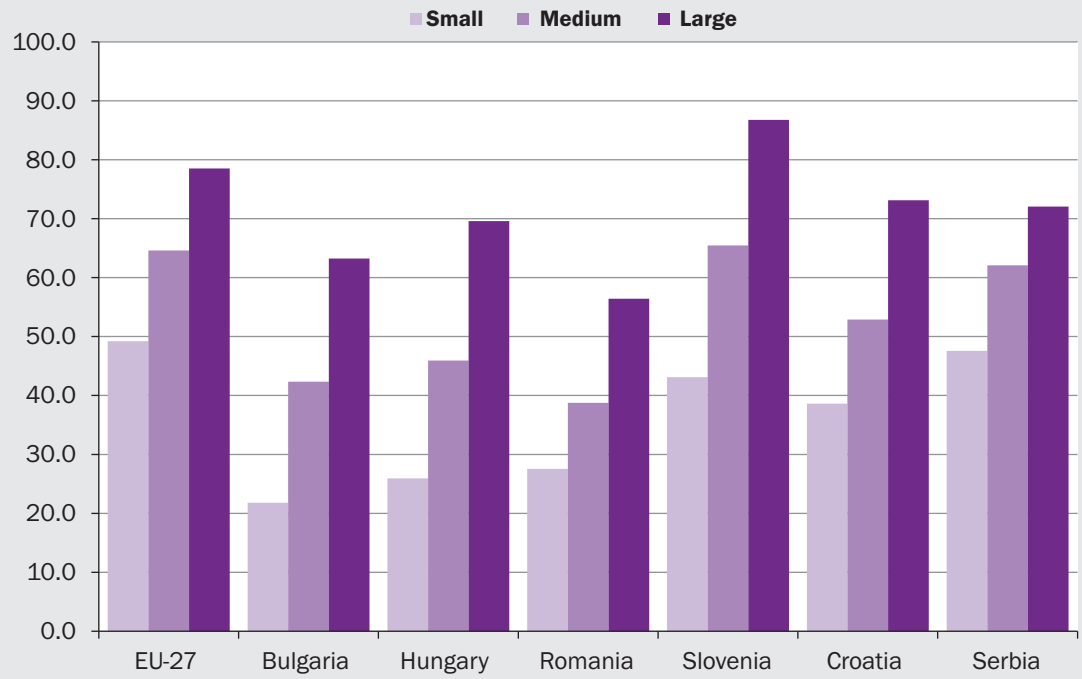
FIGURE 1 Proportion of innovative enterprises, 2010 (% of all enterprises)



SOURCE: Eurostat (online data code: inn_cis7_type)

in terms of large enterprises' innovativeness, because large enterprises in Serbia are more innovative than enterprises in Bulgaria, Hungary and Romania but less innovative than large enterprises in Slovenia and Croatia.

FIGURE 2 Innovative enterprises by size in Serbia and neighboring countries



SOURCE: Eurostat (online data code: inn_cis7_type)

FIGURE 3: Proportion of innovative enterprises by type of innovation, 2010, (% of all innovative enterprises)

SOURCE: Eurostat (online data code: inn_cis7_type)

Enterprises can be divided into three main categories by type of innovation activity: enterprises that create product innovations and/or process innovations (without innovations in the field of organization and/or marketing); enterprises that innovate in the organization and/or marketing (without product and/or process innovations); and enterprises that have developed both product/process innovations and organization/marketing innovations.

The EU countries with high shares of innovative enterprises are characterized by a significant proportion of innovative enterprises that combine product/process innovation and organizational/marketing innovation (Figure 3). Countries like Germany (58.7%)[3], Luxembourg (61.5%) and Belgium (55.4) with higher shares of innovative enterprises in the total number of enterprises are also characterized by a higher proportion of innovative enterprises that develop simultaneously both types of innovation (product/process innovation and organizational/marketing innovation). By contrast, countries with low shares of innovative enterprises in the total number of enterprises have proportionally less innovative enterprises that develop both types of innovation: in Latvia 34.5% of innovative enterprises develop both types of innovation; the shares in Romania, Poland and Bulgaria are 32.3%, 33.3 % and 29.5%, respectively (Figure 4).

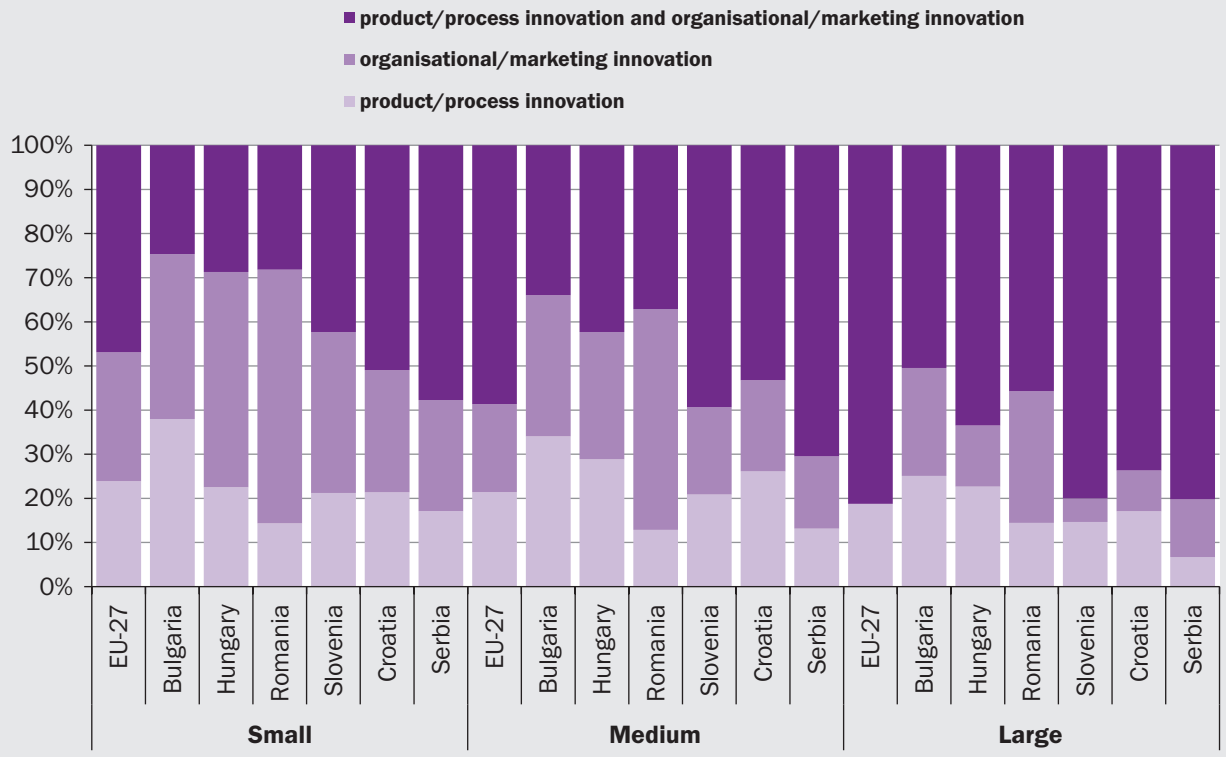
Like the EU countries with high shares of innovative enterprises, most innovative enterprises in Serbia develop simultaneously both types of innovation. Regarding this indicator, innovative enterprises in Serbia lag only behind innovative enterprises from Iceland; they are above the EU-27 average and their share is significantly higher than in all neighboring countries.

The situation is similar with innovative enterprises regarding their size. All three size classes of enterprises in Serbia dominantly develop both types of innovation, but large enterprises are dominant according to this indicator. Regarding the neighboring countries, only large innovative enterprises in Slovenia show higher share in both types of innovation. To a large extent the situation is similar with small and medium-sized innovative enterprises; in developing both types of innovation, SMEs in Serbia are dominant compared to all neighboring countries.

A significant indicator of an economy's innovative ability is the number of i.e., share of non-innovative enterprises in the total number of enterprises (Figure 5). Overall, share of non-innovative enterprises in Serbia is above the average and higher than shares in the leading innovative EU countries. However when Serbia is compared to neighboring countries, the situation is much different, because the proportion of non-innovative enterprises in Serbia is less than proportion of non-innovative enterprises in all observed neighboring countries (Bulgaria, Hungary, Romania, Slovenia and Croatia). Regarding the proportion of

[3] for more, see Table 60: Proportion of innovative enterprises by type of innovation, 2010(% of all innovative enterprises)

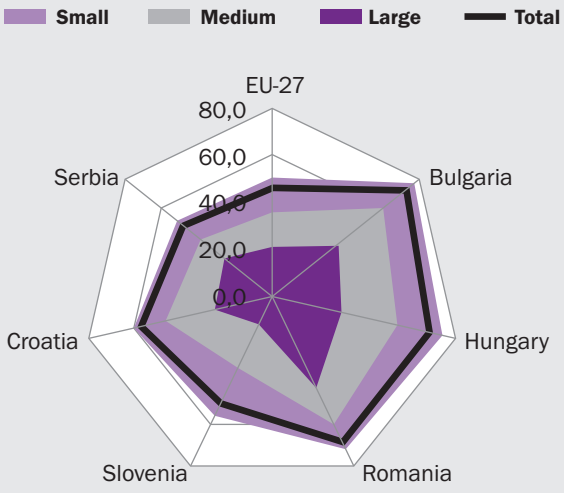
FIGURE 4: Proportion of innovative enterprises by type of innovation and size, 2010 (% of all enterprises)



SOURCE: Eurostat (online data code: inn_cis7_type)

non-innovative enterprises by size class, the situation is mainly the same. In terms of percentage, the highest proportion of non-innovative enterprises is observed with small enterprises; however proportion of non-innovative small enterprises in Serbia is lower than in neighboring countries. The situation is similar in medium-sized enterprises, except that proportion of non-innovative medium-sized enterprises in Slovenia (as % of all medium-sized enterprises) is lower than in Serbia. Different situation is observed only with large enterprises, where the percentage share of non-innovative enterprises in the total number of enterprises is

FIGURE 5: Proportion of non-innovative enterprises by size class in selected countries, 2010 (% of all enterprises)



SOURCE: Eurostat (online data code: inn_cis7_type)

the lowest. Share of large non-innovative enterprises in Serbia (as % of all large enterprises) is lower than in Bulgaria, Hungary and Romania, but higher than in Slovenia and Croatia.

INNOVATIVE COOPERATION

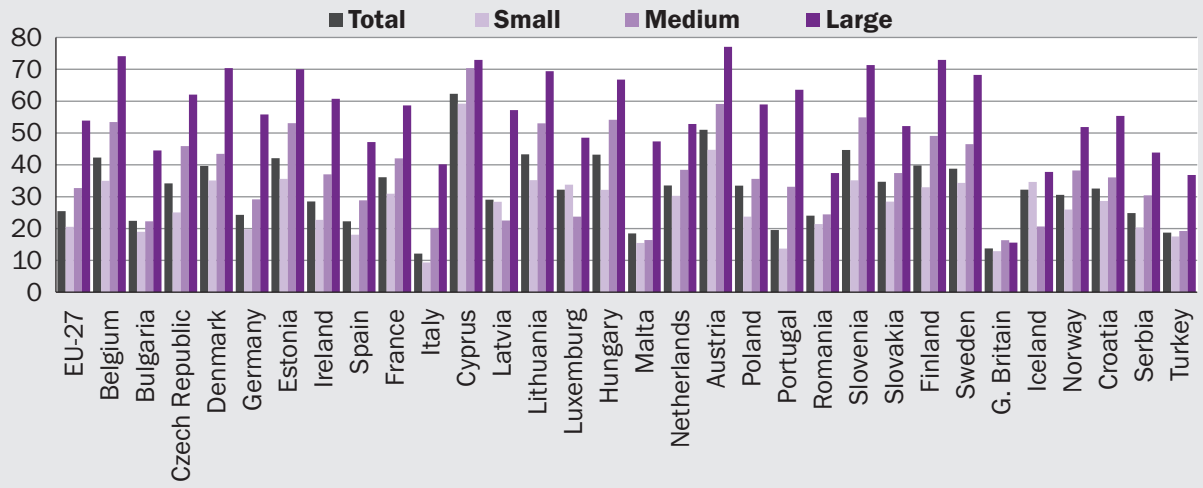
Enterprises can perform innovative activities independently (based on their own knowledge and resources) or in cooperation with other enterprises within the group, suppliers, customers, faculties and universities, private and public research institutes, specialized research organizations, etc. Depending on whether innovative enterprises cooperate with each other on their innovation activities, we can distinguish two groups of innovative enterprises (enterprises which perform innovation activities in cooperation with others and enterprises which perform innovation activities independently).

In the EU, about ¼ of innovative enterprises (enterprises that develop product and/or process innovation) are engaged in cooperation on innovation activities, as opposed to the remaining 74.5% of enterprises which perform innovation activities by relying only on their own internal resources. The greatest amount of innovative cooperation is achieved by innovative enterprises in Cyprus (62.3% of all innovative enterprises), Austria (51.0%), Slovenia (44.7%), Lithuania (43.3%) and Hungary (43.2 %); the smallest amount of innovative cooperation is achieved by innovative enterprises in Italy (12.1%), the UK (13.7%), Malta (18.5%), Portugal (19.5%), Spain (22.3%) and Bulgaria (22.4%). Innovative enterprises in Serbia rely more heavily on internal resources in innovation activities compared to the EU average, as well as compared to Hungary, Slovenia and Croatia; innovative enterprises in Serbia cooperate more with other enterprises and institutions compared to innovative enterprises in Bulgaria and Romania (Figure 6).

The classification of innovative enterprises by size shows that enterprises of different size differ among themselves in terms of innovative cooperation. This means that small, medium-sized and large enterprises behave differently in terms of innovative cooperation; as a rule, enterprise-size growth increases an amount of cooperation among enterprises. This applies to all countries observed, except for Latvia, Luxembourg and Iceland where innovative medium-sized enterprises cooperate less than innovative small enterprises. This also applies to enterprises in Serbia since 43.9% of large innovative enterprises are engaged in cooperation on innovativeness with other entities, as opposed to medium-sized (30.4%) and small enterprises (20.4%).

Enterprises can establish innovative cooperation in various ways and with various entities. Regarding innovation, enterprises in Serbia mostly cooperate with suppliers of equipment, materials, components and software (20.1%); clients or customers (18.7%), with other enterprises within the enterprise group (16.9%), consultants, commercial labs or private R&D institutes

FIGURE 6: Proportion of product and/or process innovative enterprises engaged in any type of cooperation by size class, 2010 (% of all product and/or process innovative enterprises)



SOURCE: Eurostat (online data code: inn_cis7_coop)

(15.4%), competitors or other enterprises of the same sector (14.7%), universities or other higher education institutions (13.9%), and the Government or public research institutes (10.4%). Regarding neighboring countries, domestic innovative enterprises cooperate more with other enterprises within the enterprise group, compared to all observed countries. In terms of cooperation with the Government or public research institutes, domestic enterprises cooperate more compared to neighboring countries (excluding Slovenia) and in terms of cooperation with consultants, commercial labs or private R&D institutes as well as universities and other higher education institutions, enterprises in Serbia cooperate less than enterprises in Hungary and Slovenia. Regarding cooperation with suppliers, customers, competitors or other enterprises of the same sector, enterprises in Serbia cooperate less than enterprises in Hungary, Slovenia and Croatia.

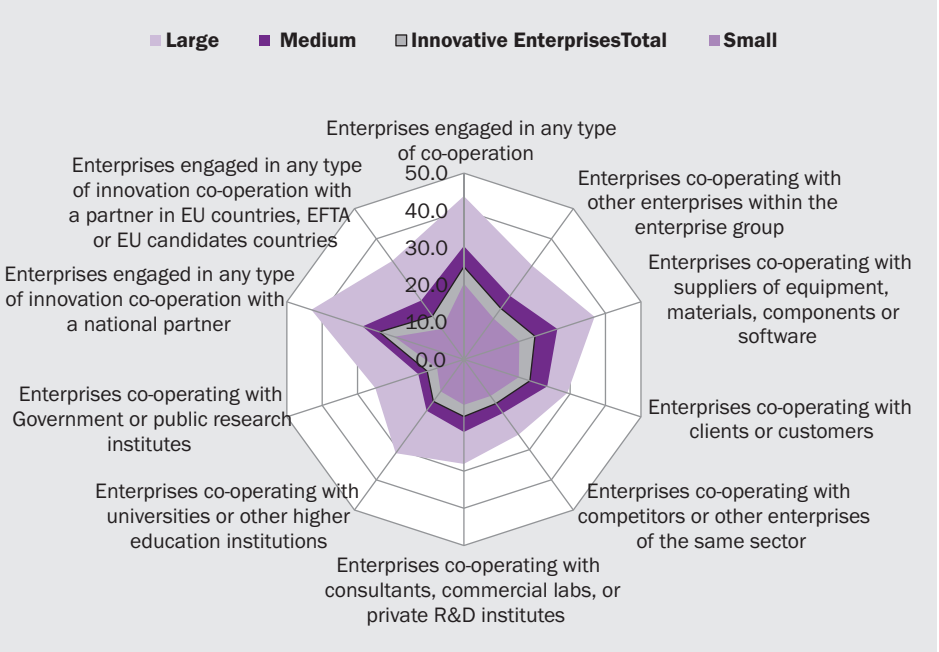
According to enterprise size, domestic SMEs (in the field of scientific cooperation) mostly cooperate with suppliers and customers; the lowest level of cooperation is established with universities or other higher education institutions and the Government or public research institutes (Figure 7). Unlike SMEs, large domestic enterprises establish the highest level of cooperation with suppliers, other enterprises within the enterprise group and universities or other higher education institutions. In terms of percentage, large domestic enterprises establish the lowest level of cooperation with competitors or other enterprises of the same sector and the Government or public research institutes. This indicates that SMEs are more market-oriented (toward suppliers and customers) while large enterprises establish stronger links with universities and other higher education institutions as well as enterprises within the enterprise group.

Extent of enterprises' orientation toward cooperation with partners in Serbia or with partners from other countries is important for considering openness to cooperation and possibility of transferring innovative knowledge and results. Generally, enterprises in Serbia to a much greater extent cooperate with partners within the country (23.8%) than with partners from the EU member states, the EU candidate states or the EFTA states (14.4%). This applies to all enterprises regardless of their size, but large enterprises are more cooperation-oriented (whether the partners are domestic or foreign) compared to medium-sized, and especially to small enterprises.

CONCLUSION

Regarding the proportion of innovative enterprises, Serbia is close to the European average and is above all observed neighboring countries (Bulgaria, Romania, Hungary, Croatia and Slovenia). As a rule, enterprise-size growth increases proportion of innovative enterprises in all observed countries.

FIGURE 7: Types of co-operation partner for product and process innovation



SOURCE: Eurostat (online data code: inn_cis7_coop)

Most innovative enterprises develop simultaneously product/process innovation and organizational/marketing innovation. Domestic innovative enterprises rely more heavily on internal resources in innovation activities compared to the EU average, as well as compared to Hungary, Slovenia and Croatia. Also, domestic innovative enterprises cooperate more closely with other enterprises and institutions compared to similar enterprises in Bulgaria and Romania. Large and SMEs behave differently in terms of innovative cooperation; as a rule, enterprise-size growth increases an amount of cooperation among enterprises.

In the field of scientific cooperation, domestic enterprises mostly cooperate with suppliers and customers; the lowest level of cooperation is established with universities or other higher education institutions and the Government or public research institutes. The most common form of marketing innovation in domestic enterprises is the introduction of a new method for pricing goods or services. In developing new ideas and innovations, domestic enterprises most heavily rely on staff training, as opposed to the EU enterprises which mostly use method of ideas elaboration. SMEs in Serbia more often use financial incentives to motivate employees to be more innovative.

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Sažetak:

Inovativnost malih i srednjih preduzeća u Republici Srbiji i zemljama Evropske Unije

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U radu je data komparativna analiza rezultata inovacionih aktivnosti preduzeća različitih veličina iz zemalja članica EU i zemalja kandidata za članstvo u EU u periodu 2008 - 2010. godine. Posebno je sagledavan položaj Srbije u odnosu na prosek EU i pojedinih zemalja iz okruženja (Mađarske, Slovenije, Hrvatske, Rumunije i Bugarske). Rezultati su potvrdili postojanje visoke korelacije između veličine preduzeća i njihovih inovacionih aktivnosti. U velikim preduzećima je procenat inovacionih aktivnosti veći u odnosu na mala preduzeća. Za Srbiju je karakteristično zaostajanje u nivou inovativnosti kod svih tipova preduzeća prema veličini u odnosu na prosek EU. Međutim u odnosu na zemlje u okruženju situacija je značajno drugačija. Mala preduzeća iz Srbije su inovativnija od malih preduzeća iz zemalja u okruženju. Slična je situacija i kod srednjih preduzeća. Velika preduzeća iz Srbije inovativnija su od preduzeća iz Bugarske, Mađarske i Rumunije, a manje su inovativna od istih iz Slovenije i Hrvatske.

Ključne reči: inovacije, inovativnost, mala i srednja preduzeća, Srbija, EU.

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