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Assessment of Innovativeness of the EU Candidate Countries Based on the European Innovation Scoreboard

Summary

Innovation is seen as a key capability for maintaining a competitive advantage, creating value for customers, and capturing a larger share of the market. In the contemporary world economy, understood as a set of mutual connections and interdependencies, innovations are crucial for economic growth and competitiveness. Internationalization and globalization processes in the world economy also concern the innovativeness of economies, and are visible in international use of technologies developed within national innovation systems, globalization of the creation and implementation of innovations, international (global) cooperation in research and development and innovation activities, international (global) protection of intellectual property.

The aim of the article is to assess the level of innovativeness of the economies of selected European Union candidate countries based on the Summary Innovation Index (SII) and its components, as well as to estimate the innovation gap between these countries and the EU average of the Summary Innovation Index in 2023. The analysis was limited to Turkey (TR), Serbia (RS), Albania (AL), Montenegro

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(ME), North Macedonia (MK), Bosnia and Herzegovina (BA) and Ukraine (UA) due to the availability of data describing the Summary Innovation Index, provided for all the EU candidate countries surveyed in the European Innovation Scoreboard. The paper formulates a research thesis assuming that the surveyed EU candidate countries are characterized by a lower level of innovativeness of economies than the EU average of the Summary Innovation Index and its components. Therefore, they show an innovation gap compared to the average for European Union countries in 2023. The results of the analysis only partially confirm this thesis. The article reviewed the literature on the innovation and innovativeness of economies and the innovation gap. The applied methods include descriptive analysis, statistical data analysis and comparative analysis along with statistical data from the European Innovation Scoreboard 2023.

Keywords: innovation, innovativeness of an economy, innovation gap, European Innovation Scoreboard, Summary Innovation Index, components of the Summary Innovation Index

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Ocena innowacyjności krajów kandydujących do Unii Europejskiej na podstawie Europejskiej Tablicy Innowacyjności

Streszczenie

Celem artykułu jest ocena poziomu innowacyjności gospodarek wybranych krajów kandydujących do Unii Europejskiej w oparciu o Sumaryczny Indeks Innowacyjności (SII) i jego składowe, a także oszacowanie luki innowacyjnej między tymi krajami a średnią dla UE w 2023 r. Z uwagi na ograniczoną dostępność danych opisujących Sumaryczny Indeks Innowacyjności i jego składowe, analiza obejmuje Turcję (TR), Serbię (RS), Albanię (AL), Czarnogórę (ME), Macedonię Północną (MK), Bośnię i Hercegowinę (BA) oraz Ukrainę (UA). W artykule

sformułowano tezę badawczą, która zakłada, że badane kraje kandydujące do UE charakteryzują się niższym poziomem innowacyjności gospodarek niż średnia unijna Sumarycznego Indeksu Innowacyjności i jego składowych, a zatem kraje te wykazują lukę innowacyjną w porównaniu do średniej dla krajów Unii Europejskiej w 2023 r. Wyniki analizy tylko częściowo potwierdzają tę tezę. W artykule dokonano przeglądu literatury dotyczącej innowacji i innowacyjności gospodarek oraz luki innowacyjnej. Zastosowano metody analizy opisowej, statystycznej analizy danych i analizy porównawczej. Wykorzystano dane statystyczne z *European Innovation Scoreboard* 2023.

Słowa kluczowe: innowacja, innowacyjność gospodarki, luka innowacyjna, Europejska Tablica Innowacyjności, Sumaryczny Indeks Innowacyjności, składowe Sumarycznego Indeksu Innowacyjności

Introduction

Innovation is a driving force behind economic growth in both national and regional economies. It promotes economic growth, increases wages, extends the product life cycle, makes technology more accessible, improves living standards, and implements new organizational structures (Aytekin, Ecer, Koruck, Karamasa 2022, p. 1; Nawrocki, Jonek-Kowalska 2022, p. 1). It improves production and business capacities, creates new jobs, facilitates transfer of technology and knowledge, reduces the lifespan of products and services and generally enhances the country's competitiveness in the global market. (Stojanović 2022, p. 23; Strahl, Sobczak 2017, p. 42; Aytekin, Ecer, Koruck, Karamasa 2022, p. 1). When discussing innovation, it should not be equated with invention, because innovation is a complex process that adds value to a specific product or service. The role that innovation plays for companies and countries is still increasing (Stojanović 2022, p. 23).

The aim of the article is to assess the level of innovativeness of the economies of selected European Union candidate countries based on the Summary Innovation Index (SII) and its components, as well as to estimate the innovation gap between these countries and the EU average of the Summary Innovation Index in 2023. The analysis was limited to Turkey (TR), Serbia (RS), Albania (AL), Montenegro (ME), North Macedonia (MK), Bosnia and Herzegovina (BA) and Ukraine (UA)[1] due to the availability of data describing the Summary Innovation Index, provided for all the EU candidate countries surveyed in the European Innovation Scoreboard. The paper formulates a research thesis assuming that the surveyed

[1] Country abbreviations from the European Innovation Scoreboard 2023, see: European Innovation Scoreboard 2023, European Commission, Brussels, June 2023, p. 114 (accessed: 18.08.2023).

EU candidate countries are characterized by a lower level of innovativeness of economies than the EU average of the Summary Innovation Index and its components, and therefore they show an innovation gap compared to the average for European Union countries in 2023. The results of the analysis only partially confirm this thesis. The article reviewed the literature on the innovation and innovativeness of economies and the innovation gap. Applied methods included descriptive analysis, statistical data analysis and comparative analysis along with statistical data from the European Innovation Scoreboard 2023.

Innovation, innovativeness, the innovation gap and their measures – the literature review

Innovation is seen as a key capability for maintaining a competitive advantage, creating value for customers, and capturing a larger share of the market (Baláž 2023, p. 1). In the contemporary world economy, understood as a set of mutual connections and interdependencies, innovations are crucial for economic growth and competitiveness. Internationalization and globalization processes in the world economy also concern the innovativeness of economies, and are visible in international use of technologies developed within national innovation systems, globalization of the creation and implementation of innovations, international (global) cooperation in research and development and innovation activities, international (global) protection of intellectual property (Marczewska, Weresa 2023, p. 101).

The concept of innovation in economic sciences was introduced by J.A. Schumpeter, who in 1912, for the first time in economic theory, formulated five cases of emergence of new combinations of various material elements and men's productive power, which he later referred to as innovations. These include (Schumpeter 1960, p. 104):

- introducing new products into production or improving the existing ones;
- introduction of a new production method, i.e. a method not yet tried in a given industry;
- opening a new market;
- acquiring new sources of raw materials or semi-finished products;
- carrying out a new organization of an industry, for example, the creation of a monopoly or its liquidation.

It is significant that the formula developed by J.A. Schumpeter's definition is still considered in the economic literature as a classic definition and is a starting point for defining concepts in the field of innovative activity. After Schumpeter`s definition there are new concepts of the innovation that exist in the economic literature. An overview of selected definitions is presented in Table 1.

Table 1. An overview of selected definitions of an innovation.

Definition of an innovation	Authors
the process of creation of market-focused value that significantly impacts the environment	Drucker 1973
ability to generate, assimilate, implement, use and exploit new ideas	Cohen and Levinthal 1989, pp. 569–596; Damanpour and Gopalakrishnan 2001, pp. 47, 61, 62; Hivner and Hopkins 2003, pp. 80–81; Urabe 1988, pp. 3–4
an idea, practice, or object perceived as new	Rogers 1995
the implementation of a new or significantly improved product (good or service), or process, a new marketing method, or a new organizational method in business practices, workplace organization or external relations. A common feature of an innovation is that it must have been implemented. A new or improved product is implemented when it is introduced on the market. New processes, marketing methods or organizational methods are implemented when they are brought into actual use in the firm's operations. The definition deals with product, process and two methods, marketing and organization.	OECD/Eurostat 2005, [in:] Gault 2018, pp. 617–618
innovation includes either the act of introduction or what is introduced itself.	Aronson 2008, p. 65
creation of tangible social value through fresh thinking or by introducing something new	Velo and Rizzini 2008, pp. 440–445
a multistage process of transforming organizational ideas into new or improved products, processes, or services to advance, compete, or differentiate successfully in the market.	Baregheh, A., J. Rowley, and S. Sambrook 2009, pp. 1330–1334
creation of new opportunities by harnessing creative ideas	Zhang 2011, pp. 1–4
leads to the commercialization of the invention	Gaynor 2013
can be understood broadly and narrowly. In its narrow aspect, an innovation is treated as something new, marketed for the first time, and usually is technical in nature. In its broader aspect, results of innovations are an important element of social reality, organizational structures, and marketing solutions, not only economic practice. Innovations understood in such a way bring benefits to the general public, not only to employers and producers, but also consumers and employees	Ziółkowska 2018, p. 72; Maradana, Pradhan, Dash, Guaraw, Jajakumar, Chatterjee 2017, p. 2
the operationalization of creative potential with a commercial and/or social motive by implementing new adaptive solutions that create value, harness new technology or invention, contribute to competitive advantage and economic growth	Sanjay, Yogita 2022, p. 195

Source: own compilation.

The analysis of the definitions of innovations presented in Table 1 allows us to formulate a conclusion that "innovation" is a concept related to the concept of "innovativeness" (Dworak, Grzelak 2020, p. 37; Okrzesik 2018, p. 314). Sometimes these two terms are used interchangeably, but they are not the same. Innovativeness is defined as an ability to innovate (Weresa 2012, p. 27), because according to the terminology, it means activity aimed at implementing innovations, both in the private and public sector (*Potencjał innowacyjny gospodarki: uwarunkowania, determinanty, perspektywy* 2016, p. 21). The innovativeness of the economy can also be understood as its ability to create and implement innovations, where *ex ante* it is the possibility of developing new solutions, while *ex post* it is the combined effect of the innovative activity of the enterprise and other entities operating in a given economy in the analyzed period (Weresa 2012, p. 23) .

Innovativeness is a complex, multidimensional and difficult to measure phenomenon, which implies a need to select various indicators and methods for its assessment (Roszko-Wójtowicz, Dańska-Borsiak, Grzelak, Pleśniarska 2022, p. 1017). In the economic literature there are basically three ways to measure its level (*Potencjał innowacyjny gospodarki: uwarunkowania, determinanty, perspektywy* 2016, p. 23; Szajt 2020, p. 9):

- measurement using input indicators (e.g. expenditure on research and development and the number of employees in research and development);
- measurement based on result indicators (e.g. patent registers, the country's balance of payments in the field of technology – flow of own technologies and know-how from and to the country, funds obtained and paid for the use of patents, licenses, trademarks and service, the number of scientific publications or the volume of sales of new and modernized products;
- measurement based on synthetic indicators, created on the basis of both input and output measures; these indicators consist of numerous sub-measures and are developed in order to make more multifaceted comparisons of the level of innovativeness of economies; their advantage is an increase in international comparability thanks to the parallel use of many variables describing the innovativeness of economies. Synthetic measures of innovativeness are widely used in comparative analyses, in particular presenting results in international or interregional cross-sections (Roszko-Wójtowicz, Dańska-Borsiak, Grzelak, Pleśniarska 2022, p. 1017).

To assess the level of innovativeness of the economy, the estimation of the innovation gap between the economy of a given country and another entity recognized as a point of reference can also be used. The theoretical background for the innovation gap is formed by different studies on the technological gap in the world economy (Posner 1961, pp. 323–341; Krugman 1979) and recently in Central European countries (Kubielas 2016, pp. 7–10; Kowalski 2020, pp. 1966–1981). An overview of selected definitions of the innovation gap is presented in Table 2.

Table 2. An overview of selected definitions of the innovation gap

Definition of an innovation gap	Authors
the distance between those who have access to technologies and know how to use them effectively, and those who are not able to do it	Kraciuk 2006, p. 5
differences in the level of technological advancement between countries; it can be measured by the distance between the level of technological activity of a country and the countries at the technological frontier, calculated either as a ratio of the number of patents per capita or the share of research expenditure in value-added or national income	Kubielas 2013, p. 137
the global technological frontier is deemed to be the GDP level that can be achieved using the given inputs of capital and labor and the best possible technologies	Growiec 2012
can be considered from the perspective of creating new technology in the home country, as well as from the perspective of its transfer from other countries and effectively adapting it to the needs and capabilities of the nation	Dworak, Grzelak 2023, p. 12

Source: own compilation

One of the attempts to estimate the innovation gap is based on the indicator that shows the difference between the level of the Summary Innovation Index for EU candidate countries and the average value of this index for the European Union. The indicator of the innovation gap defined in this way takes the following form (Weresa 2014, p. 64):

$$L_{pt} = \frac{SII_{pt}}{SII_{UEt}} \quad (1)$$

where:
L_{pt} – the innovation gap index for a given EU candidate country in relation to the EU average in year *t*,
SII_{pt} – the Summary Innovation Index for a given EU candidate country in year t,
SII_{UEt} – the average Summary Innovation Index for the EU in year *t*.

The value of the innovation gap index exceeding 1 means that the analyzed country presents a higher level of innovativeness than the EU average, while a value lower than 1 indicates that the innovation gap exists between a given country and the EU average.

Assessment of the level of innovativeness of the EU candidate countries and the innovation gap between the EU candidate countries and the EU average of the Summary Innovation Index along with its components – results and discussion

The assessment of the level of innovativeness of the economies of the EU candidate countries was carried out based on the values of the Summary Innovation Index in 2023, developed by the European Commission and presented in the "European Innovation Scoreboard 2023" (European Innovation Scoreboard 2023). The annual European Innovation Scoreboard (EIS) provides a comparative assessment of the research and innovation performance of EU Member States and selected third countries as well as the relative strengths and weaknesses of their research and innovation systems. It helps countries assess areas in which they need to concentrate their efforts in order to boost their innovation performance (European Innovation Scoreboard 2023, p. 5). The EIS 2023 distinguishes between four main types of activities (components) – "Framework conditions", "Investments", "Innovation activities", and "Impacts" – with 12 innovation dimensions (subindices), capturing in total 32 indicators. Each main group includes an equal number of indicators and has an equal weight in the average performance score, or the Summary Innovation Index (SII). "Framework conditions" captures the main drivers of innovation performance external to the firm. "Investments" means investments made in both the public and business sectors. "Innovation activities" captures different aspects of innovation in the business sector. "Impacts" represents the effects of enterprises' innovation activities. Within each group every indicator has the same weight. Indicators that are included in the measurement framework are presented in Table 3.

Table 3. Components of the Summary Innovation Index in 2023

FRAMEWORK CONDITIONS	Human resources (HR)	• New doctorate graduates (in STEM) • Population aged 25–34 with tertiary education • Lifelong learning
	Attractive research systems (ARS)	• International scientific co-publications • Top 10% most cited publications • Foreign doctorate students
	Digitalization (D)	• Broadband penetration • Individuals who have above basic overall digital skills

Table 3. (continued)

INVESTMENTS	Finance and support (F&S)	• R&D expenditure in the public sector • Venture capital expenditures • Direct government funding and government tax support for business R&D
	Firm investments (FI)	• R&D expenditure in the business sector • Non-R&D innovation expenditures • Innovation expenditures per person employed in innovation-active enterprises
	Use of information technologies (UofIT)	• Enterprises providing training to develop or upgrade ICT skills of their personnel • Employed ICT specialists
INNOVATION ACTIVITIES	Innovators (I)	• SMEs with product innovations • SMEs with business process innovations
	Linkages (L)	• Innovative SMEs collaborating with others • Public-private co-publications • Job-to-job mobility of Human Resources in Science & Technology
	Intellectual assets (IA)	• PCT patent applications • Trademark applications • Design applications
IMPACTS	Employment impacts (EI)	• Employment in knowledge-intensive activities • Employment in innovative enterprises
	Sales impacts (SI)	• Medium and high-tech product exports • Knowledge-intensive services exports • Sales of product innovations
	Environmental sustainability (ES)	• Resource productivity • Air emissions by fine particulates PM2.5 in Industry • Development of environment-related technologies

Source: European Innovation Scoreboard 2023, European Commission, Brussels, June 2023, p. 114.

Table 4 shows the values of the Summary Innovation Index for EU candidate countries and the average value of the SII for EU countries in 2023, as well as the values of the dimensions (subindices) of the Summary Innovation Index in 2023 for the analyzed countries. On the basis of the value of SII and its dimensions, rankings of candidate countries for the European Union in 2023 were prepared (Table 5).

Table 4. The Summary Innovation Index and its dimensions for EU candidate countries and the average value of the SII for EU countries in 2023

	SII (2023)	FRAMEWORK CONDITIONS			INVESTMENTS			INNOVATION ACTIVITIES			IMPACTS		
		HR	ARS	D	F&S	FI	U of IT	I	L	IA	EI	SI	ES
EU average	0.548	100	100	100	100	100	100	100	100	100	100	100	100
AL	0.225	53.6	42	4.1	0.0	0.0	n/a	70.4	41.3	32.6	37.5	53.2	98.6
BA	0.198	9.6	37.3	26.9	19.7	0.7	63.5	110.5	15.4	7.7	78.6	28.6	89.7
MK	0.254	159.7	162.4	139.4	129	78.6	32.8	155.6	244.7	57.4	133.5	55.3	82.8
ME	0.258	47.3	46.7	59.2	3.2	101.9	142.9	132.2	65.4	17.8	99.5	72.1	27.6
RS	0.346	32.8	84.8	43.2	15.6	40.0	79.7	60,0	50	14,4.	30.7	68.8	87.3
TR	0.260	48.5	45.6	36.6	68.6	46.8	32.6	58.4	64.7	27.1	23.1	65.9	44.1
UA	0.170	34.9	17.5	–	3.2	31.7	22.1	0.0	21	17.3	7.8	38.3	76.7

n/a – not available

Source: European Innovation Scoreboard 2023, European Commission, Brussels, June 2023, p. 112

Table 5. Ranking of the EU candidate countries based on the values of the Summary Innovation Index and its dimensions in 2023

Rank	SII (2023)	FRAMEWORK CONDITIONS			INVESTMENTS			INNOVATION ACTIVITIES			IMPACTS		
		HR	ARS	D	F&S	FI	U of IT	I	L	IA	EI	SI	ES
1	RS	MK	MK	MK	MK	ME	ME	MK	MK	MK	MK	ME	AL
2	TR	AL	RS	ME	TR	MK	RS	ME	ME	AL	ME	RS	BA
3	ME	TR	ME	RS	ME	TR	BA	BA	TR	TR	BA	TR	RS
4	MK	ME	TR	TR	UA	RS	MK	AL	RS	ME	UA	MK	MK
5	AL	UA	AL	BA	BA	UA	TR	RS	AL	UA	AL	AL	UA
6	BA	RS	BA	AL	RS	BA	UA	TR	UA	RS	RS	UA	TR
7	UA	BA	UA	–	AL	AL	–	UA	BA	BA	TR	BA	ME

Source: European Innovation Scoreboard 2023, European Commission, Brussels, June 2023, p. 112.

Based on the data in Tables 4 and 5, it can be concluded that in 2023 Serbia was at the top of the ranking of the Summary Innovation Index in the group of EU candidate countries (0.346). It was followed by Turkey (0.260), Montenegro (0.258) and North Macedonia (0.254). In the discussed group of countries, further places in the SII ranking were taken by: Albania (0.225), Bosnia and Herzegovina (0.192) and Ukraine (0.17). In the same year, the EU average SII was 0.548, so all the analyzed countries showed an innovation gap in relation to

the EU average of the SII, measured on the basis of formula (1). The level of the innovation gap is presented in Table 6.

Table 6. The innovation gap index for EU candidate countries in relation to the EU average (Lpt) in 2023

	AL	BA	MK	ME	RS	TR	UA
Lpt 2023	0.41	0.361	0.463	0.47	0.631	0.474	0.31

Source: calculations based on the data in Table 4.

The analysis of the data in Table 6 leads to the conclusion that the lowest innovation gap compared to the EU average was shown by Serbia (0.631), followed by Turkey (0.474), Montenegro (0.47), North Macedonia (0.463), Albania (0.41), then Bosnia and Herzegovina (0.361) and Ukraine (0.31).

As for the dimensions (subindices) of the Summary Innovation Index, it should be stated that they can be used to assess innovation performance in individual innovative areas. Therefore, in the area of "Framework conditions", describing the main drivers of innovation performance external to the company, the highest values in all areas, exceeding the EU average, were recorded by North Macedonia. Albania (subindex slightly above half of the EU average) was in the lead of the ranking of variables describing *Human resources*, followed by Turkey (slightly below half of the EU average). In terms of variables describing *Attractive Research Systems*, North Macedonia was followed by Serbia (nearly 85% of the EU average) and Montenegro (below half of the EU average). As for the *Digitalization* area, Montenegro (subindex at the level of almost 60% of the EU average) and Serbia (43% of the EU average) followed North Macedonia.

Another area describing innovation performance, measured by SII, is investments undertaken in both the public and private sectors ("Investments"). In this area, the ranking of the *Finance and support* subindex was again headed by North Macedonia with an index exceeding the EU average (almost 129%). It was followed by Turkey (almost 69% of the EU average) and Montenegro (slightly over 39% of the EU average). With regard to the next two subindices – *Finance investments* and *Use of Information Technologies*, it should be noted that Montenegro is at the top of the ranking (in both cases the subindices are higher than the EU average). In the area of *Finance investments*, North Macedonia ranks second (78.6% of the EU average) and Turkey (almost 47% of the EU average). As for *the Use of Information Technologies*, the second place, after Montenegro, is occupied by Serbia (nearly 80% of the EU average) and Bosnia and Herzegovina (63.5% of the EU average).

As for the third SII component area – "Innovation activities", it should be noted that in the case of three SII subindices, the highest values and the highest places in the ranking are again held by North Macedonia, recording values of

variables above the EU average in the *Innovators* group – it is over 155% of the EU average, and *Linkages* – as much as 244.74% of the EU average. In the group of variables representing *Intellectual Assets*, North Macedonia recorded a subindex value of 57.4%. With regard to the *Innovators*, subindices above the EU average were recorded by Montenegro (132.2%) and Bosnia and Herzegovina (110.5%). In the area of *Linkages,* Montenegro was ranked second, after North Macedonia (65.4% of the EU average), while in the area of *Intellectual Assets*, the subindex values for all countries, except for North Macedonia, were relatively low and below 1/3 of the EU average.

In the group of subindices representing the effects of enterprises' innovation activities (component – "Impacts"), the highest value of the *Employment Impacts* subindex was recorded by North Macedonia (133.5% of the EU average), followed by Montenegro (almost 100% of the EU average) and Bosnia and Herzegovina (78.6% of the EU average). As for the group of variables belonging to *Sales Impacts*, the values of the subindices for all the analyzed countries were lower than the EU average; the highest value was recorded by Montenegro (just over 72% of the EU average), followed by Serbia (almost 69% of the EU average) and Turkey (almost 66% of the EU average). Also in the group of variables representing *Environmental Sustainability*, all the surveyed countries reached the level of variables below the EU average. The highest value of the subindex in this group was recorded by Albania (almost 100% of the EU average), followed by Bosnia and Herzegovina (almost 90% of the EU average) and Serbia (slightly over 87%).

Conclusion

Summing up the considerations on the level of innovativeness of the economies of EU candidate countries in 2023, the following conclusions can be drawn.

Firstly, based on the value of the Summary Innovation Index in 2023, the leaders in terms of innovation activities include Serbia, which recorded the highest level of SII in the surveyed group of countries, as well as Turkey, Montenegro and North Macedonia. They took subsequent places in the SII ranking in 2023, however, their level of this index is similar.

Secondly, based on the subindices of the Summary Innovation Index in 2023, it should be concluded that North Macedonia and Montenegro are the leaders in individual areas of economic innovation. North Macedonia was at the top of the ranking of all subindices describing the area of "Framework conditions" and "Innovation activities", as well as in the field of *Finance and support* and *Employment Impacts*. North Macedonia is therefore a leader in eight out of twelve groups of subindices describing the SII, in the case of seven subindices it recorded

values above the EU average. Montenegro, on the other hand, is at the forefront of the ranking of three subindices – *Finance investments*, *Use of information technologies*, as well as *Sales Impacts*, in the case of four subindices it takes second place (*Digitalization, Innovators, Linkages and Employment Impacts*). Montenegro also recorded the values of three subindices above the EU average.

Thirdly, it should be added that the countries recognized as innovation leaders in the surveyed group of EU candidate countries are characterized by relatively the highest expenditure on R&D in the group of countries surveyed. Thus, for Turkey, this indicator is 0.96% of GDP (2022), for Serbia – 0.91% of GDP (2020), for North Macedonia – 0.38% of GDP (2020) and for Montenegro – 0.36% of GDP (2019) (https://data.worldbank.org/indicator/GB.XPD.RSDV.GD.ZS?locations, accessed: 27.07.2023).

Fourthly, countries with a low innovation potential include Albania, Bosnia and Herzegovina and Ukraine and they are also characterized by low expenditure on R&D. For Albania it was only 0.15% of GDP in 2008, for Bosnia and Herzegovina – 0.21% of GDP (2020), for Ukraine – 0.41% GDP in 2020 (https://data. worldbank. org/indicator/GB.XPD.RSDV.GD.ZS?locations, accessed: 27.07.2023). In case of these countries a necessary condition for successful accession negotiations and economic development is modernization based on innovative development which ensures the increase of the profitability of industrial enterprises, real wages and welfare (Zhylinska, Bazhenova, Dluhopolskyi, Zatonatska 2020, p. 10). It is obvious that in the case of Ukraine it will be difficult to meet these assumptions in the conditions of the ongoing war (Honcharov, Dykha, Voronina, Milka, Klymenchukova 2023, p. 180).

Based on the above conclusions, it should be stated that the research thesis adopted in the introduction of the article was only partially confirmed, i.e. all EU candidate countries show a lower level of innovativeness of the economy, measured by SII, than the EU average of this index. Nevertheless, when individual areas of the innovativeness are considered – SII subindices, it turns out that North Macedonia, Montenegro and Bosnia and Herzegovina show the level of some indices higher than the EU average – there are seven subindices for North Macedonia, three subindices for Montenegro and one subindex for Bosnia and Herzegovina.

The conclusions formulated on the basis of the conducted analysis are important both from the point of view of the European Union and the candidate countries (Aytekin, Ecer, Koruck, Karamasa 2022, p. 1). The European Union should take into account the state of the innovation potential of individual candidate countries in the ongoing accession negotiations. Therefore, a country with a high innovation potential should strengthen its bargaining power and be given priority in these negotiations. High innovation potential means that there is a high probability for the country to conduct successful innovation activity and to manufacture high technology in the future.

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