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МЕНАџМЕНТ
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МЕФ

MEFKON

International Scientific Conference

МЕЂУНАРОДНА НАУЧНО-СТРУЧНА КОНФЕРЕНЦИЈА

**INNOVATION AS AN INITIATOR
OF THE DEVELOPMENT**
ИНОВАЦИЈЕ КАО ПОКРЕТАЧ РАЗВОЈА

INNOVATIVE ACTIVITIES – CONTEMPORARY CHALLENGES AND SOLUTIONS
ИНОВАТИВНА ДЕЛАТНОСТ – САВРЕМЕНИ ИЗАЗОВИ И РЕШЕЊА

INTERNATIONAL CONFERENCE PROCEEDINGS

ЗБОРНИК РАДОВА СА МЕЂУНАРОДНОГ СКУПА

INNOVATIONS

5. децембар 2019. Београд

Универзитет Привредна академија у Новом Саду

University Business Academy in Novi Sad

Факултет за примењени менаџмент, економију и финансије Београд

Faculty of Applied Management, Economics and Finance Belgrade

Међународна научно-стручна конференција

International Scientific & Professional Conference

МЕФкон 2019 / MEFkon 2019

ИНОВАЦИЈЕ КАО ПОКРЕТАЧ РАЗВОЈА

„Иновативна делатност – савремени изазови и решења“

INNOVATION AS AN INITIATOR OF THE DEVELOPMENT

“Innovative Activities – Contemporary Challenges and
Solutions”

ЗБОРНИК РАДОВА СА МЕЂУНАРОДНОГ СКУПА

INTERNATIONAL CONFERENCE PROCEEDINGS

Београд, 5. децембар 2019. године
Међународна научно-стручна конференција
МЕФкон 2019:

„Иновације као покретач развоја“
Зборник радова са међународног скупа –
електронско издање
**радови су објављени у изворном облику*

Belgrade, December 5th 2019
International Scientific & Professional Conference
MEFkon 2019:

“Innovation as an Initiator of the Development”
International Conference Proceedings –
digital edition
**papers were published in the original form*

Издавач / Publisher

Факултет за примењени менаџмент, економију и финансије Београд
Faculty of Applied Management, Economics and Finance Belgrade

За издавача / For the Publisher:

Miodrag Brzaković, PhD, Council President
Tomislav Brzaković, PhD, Dean

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Darjan Karabašević, PhD
Svetlana Vukotić, PhD

Технички уредници / Technical editors

Sanja Anastasija Marković, MSc
Vuk Mirčetić, MSc

Дизајн / Design

Strahinja Vidojević, Bsc

Штампа / Print

Факултет за примењени менаџмент, економију и финансије Београд
Faculty of Applied Management, Economics and Finance Belgrade

Тираж / Number of copies

100

ISBN 978-86-84531-45-4

Организатор / Organizer:

Факултет за примењени менаџмент, економију и финансије, Београд
Faculty of Applied Management, Economics and Finance, Belgrade

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ПРЕДГОВОР

У савременом друштву, појам иновација и иновирања постао је веома значајан, у тој мери, да је у већини мисија и визија савремених компанија коришћење ове речи постало обавеза. Међутим, посматрано и шире, суштина свих развојних промена, углавном, огледа се у иновативности. Иновације су свуда око нас. То што су иновације толико присутне у целокупном подручју људске активности, намеће потребу да иновативност постане уводна тачка приликом анализе комплексности нове економије, друштва и културе у настајању, укључујући и индивидуу. Овај процес даље имплицира неминовно разматрање повратне спреге иновација и развоја. Управо отуда проистиче покретачки мотив да се Факултет за примењени менаџмент, економију и финансије из Београда заједно са суорганизаторима бави ове године на Четвртој међународној научно-стручној конференцији темом „Иновације као покретач развоја“.

Традиционално организовање овог међународног научног скупа има за циљ да покаже да иновација није само део пословне стратегије предузећа, већ да покреће економску добробит и утиче на прогрес целе једне земље.

Примерено теми и циљу научног скупа установљене су две сесије: I сесија: Иновације – темељ развоја (Тематски зборник) и II сесија: Иновативна делатност – напредак и будућност (Зборник радова са међународног скупа). Избор теме скупа и свеприсутност иновација, као и понуђени већи број тематских области утицао је да су у овој публикацији радови многих угледних универзитетских професора, истакнутих истраживача, експерата и научних радника, како из Србије, тако и из иностранства.

Зборник радова са међународног скупа, као резултат конференције, публикован је на CD-у и биће доступан широј научној јавности. Радови у овој публикацији значајно доприносе утврђивању нераскидиве везе између иновација и развоја. Истовремено смо показали да подручје иновација дефинитивно више није везано само за техничко – технолошки прогрес. У складу са тим, радови могу бити корисни како научној, тако и стручној јавности и свим заинтересованим за утицај иновација на развој.

Београд,

Децембар, 2019.

Уредници

Др Дарјан Карабашевић

Др Светлана Вукотић

FOREWORD

In contemporary society, the notions of “innovation” and “innovating” have become very significant, that being so to an extent that, in the majority of the missions and visions of contemporary companies, the use of this word has become mandatory. From a broader perspective, too, however, the essence of all developmental changes mainly reflects in innovativeness. Innovations are all around us. The fact that innovations are, to such an extent, present in the overall field of the human activity imposes the need for innovativeness to become the introductory point in carrying out the analysis of the complexity of the newly-emerging economy, society and culture, also including an individual. This process is further implicative of the unavoidable consideration of the innovation-development feedback. Thence exactly arises the driving motive for the Faculty of Applied Management, Economics and Finance in Belgrade to deal with the foregoing, together with the co-organizers, at the Fifth International Scientific-Professional Conference, entitled “Innovation as an initiator of the development”.

This international scientific conference is traditionally organized with the aim of demonstrating that innovation is not only a part of an enterprise’s business strategy, but also drives economic wellbeing and influences the progress of one whole country.

Suitably to the theme and the goal of the scientific conference, the two sessions are established: Session 1 – Innovations – development prospects (Thematic Proceedings), and Session 2 – Innovative activities – contemporary challenges and solutions (International Conference Proceedings). The choice of the conference theme and the omnipresence of innovations, as well as the offered larger number of the thematic fields, have influenced the inclusion of the papers by many distinguished university professors, eminent researchers, experts and scientific workers both from Serbia and from abroad in this publication.

As a result of the Conference, the *Conference Proceedings* are published on CD and the same will be available to a wider scientific audience. The papers in this publication significantly contribute to the establishment of an inextricable liaison between innovations and development. Simultaneously, we have demonstrated that the field of innovations is definitely no longer only related to technical-technological progress. In accordance with that, the papers may also be beneficial to both the scientific and the professional public and to all those interested in the impact of innovations on development.

Belgrade,

December, 2019

Editors

Darjan Karabašević, PhD

Svetlana Vukotić, PhD

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MCDM FRAMEWORK FOR EVALUATION OF THE TOURISM DESTINATION COMPETITIVENESS

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Abstract: In this paper, we performed an evaluation and ranking of the 13 European countries regarding the 9 evaluation criteria connected to their tourism performance. The assessment procedure is conducted by applying the Evaluation Based on Distance from Average Solution – EDAS method. The main goal of the paper is to determine the current position of the Republic of Serbia as a tourism destination and to emphasize the possibilities of the EDAS method as a convenient tool for the facilitation of the decision-making process. The obtained result shows that the Republic of Serbia has the worst tourism performance and therefore the serious effort should be made to improve its competitiveness as a tourism destination in the future.

Keywords: EDAS method, tourism, destination, competitiveness, ranking, Republic of Serbia

1. INTRODUCTION

Tourism represents an activity which global importance has significantly increased in recent years. This branch of tertiary sector has a positive impact on the gross domestic product (GDP) as well as on the other aspects of the economic activity of the particular country and, therefore, requires full attention of the government, public and private organizations and researchers (Cîrstea, 2014). The countries worldwide have recognized the potential and contribution that tourism could give to their economy and prosperity which leads to the aggravating of the market competition. Intending to increase the tourism competitiveness, countries are continually working on the improvement of the attractiveness and offer of their tourism destinations.

According to the World Tourism Organization – UNWTO (2018) the number of international tourist arrivals in the South/Mediterranean Europe continually grows and reached the number of 267.4 million in 2017. Relative to 1995 this represents a very significant increment of 165%. The Republic of Serbia that UNWTO in its report classified as a country of a mentioned part of Europe has a significant potential for tourism development and better positioning on the global tourism market. This potential is especially connected to the possibilities for further improvement of the rural, spa and mountain tourism. The data from the UNWTO (2018) shows that the Republic of Serbia still lags behind the neighboring countries such as Slovenia, Croatia, and Montenegro. Nevertheless, when we look at the data about tourist arrivals we can see that the given number increased in 2016 relative to 2015 for 13.2% and in 2017 relative to 2016 for 16.6%. This reflects the fact that the Republic of Serbia becomes an interesting destination for the tourists that are seeking new experiences. But, remains the question of what should be done regarding the improvement of the competitiveness and attractiveness of the Republic of Serbia as a tourism destination.

Until now, many authors gave attention to the question of the competitiveness of a tourism destination. The very interesting topic is the factors that determine the competitiveness of a destination as well as the possibilities for their measuring. As Santos et al. (2014) argued in their paper, these issues have been observed across different scientific disciplines such as management and economics. The critical point is defining of the elemental factors that impact on the ability of a destination to be concurrent on

the tourism market (Wilde & Cox, 2008). Cracolici et al. (2008) analyzed the destination efficiency to estimate its tourism competitiveness by using the statistical approach. The problem of the definition and evaluation of the competitiveness factors of tourism was observed in the paper by Navickas and Malakauskaite (2009). Gomezelj and Mihalič (2008) applied the De Keyser-Vanhove model as well as the Integrated model to define the destination competitiveness of Slovenia. Knežević et al. (2016) used the productivity-related measure in analyzing the same issue.

Besides, the authors proposed the application of different methodologies for evaluation and ranking of the countries i.e. destinations according to the competitiveness indexes. Bearing in mind the fact that the competitiveness could be measured by using different criteria, the application of the Multiple-Criteria Decision-Making (MCDM) methods is justified. These methods enable the assessment and ranking of alternatives by acknowledging all evaluation criteria without prioritization of anyone of them. In that way, the obtained results are not biased and the degree of the incorporation of the subjectivity in the decision process is minimized. The comprehensive overview of the proposed MCDM methods could be found in the papers of Kornyshova and Salinesi (2007), Zavadskas and Turskis (2011), and Zavadskas *et al.* (2014). Also, the authors introduced appropriate extensions of the proposed MCDM methods to involve the uncertainty of the environment in the decision process (Afful-Dadzie *et al.*, 2017; Liao *et al.*, 2018).

In the area of tourism competitiveness, the authors have proposed the application of different MCDM techniques for assessment and ranking of particular destinations. Zhang et al. (2011) applied the TOPSIS and information entropy on the case of the Yangtze River Delta of China while Peng and Tzeng (2012) proposed the application of the MCDM approach based on the DANP and VIKOR for ranking the strategies for enhancing the tourism competitiveness. Göksu and Kaya (2014) used the MCDM framework for ranking the tourism destinations in Bosnia and Herzegovina. For evaluation the performance of the Indian states as tourism destinations, Ranjan et al. (2017) used the combination of PROMETHEE-GAIA techniques. By using the Data Envelopment Analysis and MCDM approach Gómez-Vega and Picazo-Tadeo (2019) performed the ranking of world tourism destinations based on the competitiveness indicator.

In this paper 13 countries located in the Central and Southern/Mediterranean Europe are ranked relative to the 9 criteria. The Republic of Serbia is one of the counties submitted to the evaluation process, as well. The data connected to the considered criteria on which the procedure will be based is retrieved from The Travel & Tourism Competitiveness Report 2019. In our case, the weight of the criteria is determined by using the Entropy method (Shannon, 1948) while the assessment of the considered destinations and their final ranking are performed by applying the Evaluation Based on Distance from Average Solution (EDAS) method proposed by Keshavarz Ghorabae *et al.* (2015).

So far, the EDAS method has been applied to solve various problems in different areas, such as: ABC inventory classification (Keshavarz Ghorabae *et al.*, (2015), facility location selection (Keshavarz Ghorabae, et al. 2016a), supplier selection (Keshavarz Ghorabae *et al.* 2016b, 2017; Stević *et al.* 2017), third-party logistics provider selection (Ecer, 2018), and autonomous vehicles selection (Zavadskas *et al.*, 2019). Because the mentioned method proved its usefulness in the given business fields, we consider that it will facilitate the evaluation and ranking process in our case, as well. The main target of this paper is to determine the position of the Republic of Serbia as a tourist destination relative to the concurrent countries from this part of Europe as well as to present the applicability of the proposed EDAS method. With that aim, the remainder of the paper is organized as follows: in the second part the Entropy method is explained; the computational procedure of the EDAS method is presented in the third part; the fourth part contains a comprehensive numerical example; at the end, the conclusion is given.

2. DETERMINING THE SIGNIFICANCE OF THE CRITERIA BY USING SHANNON'S ENTROPY

The entropy method is used to determine the objective significance of criteria in many articles, such as: Gou and Liao (2017), Shemshadi *et al.* (2011), Wang and Lee (2009), Chan *et al.* (1999), and so on.

Based on the entropy method, the significance of the objective j is calculated as follows (Wang and Lee, 2009):

$$s_j = \frac{1 - e_j}{\sum_{j=1}^n (1 - e_j)}, \quad (1)$$

with:

$$e_j = \frac{1}{\ln(m)} H(x), \text{ and} \quad (2)$$

$$p_{ij} = \frac{x_{ij}}{\sum_{i=1}^m x_{ij}}, \quad (3)$$

where: s_j denotes the significance of the objective j , x_{ij} and p_{ij} denote the rating of the alternative i on the objective j , p_{ij} denotes the probability of x_{ij} , i denotes the alternatives; $i=1, \dots, m$, and j denotes the objectives; $j=1, \dots, n$.

3. THE EDAS METHOD

The procedure of solving a decision-making problem with m alternatives and n beneficial criteria using the EDAS method can be presented using the following steps:

Step 1. Determine the average solution according to all criteria, as follows:

$$x_j^* = (x_1, x_2, \dots, x_n), \quad (4)$$

with:

$$x_j^* = \frac{\sum_{i=1}^m x_{ij}}{m}. \quad (5)$$

where: x_{ij} denotes the rating of the alternative i in relation to the criterion j .

Step 2. Calculate the positive distance from average (PDA) d_{ij}^+ and the negative distance from average (NDA) d_{ij}^- , as follows:

$$d_{ij}^+ = \frac{\max(0, (x_{ij} - x_j^*))}{x_j^*}, \quad (6)$$

$$d_{ij}^- = \frac{\max(0, (x_j^* - x_{ij}))}{x_j^*}. \quad (7)$$

Step 3. Determine the weighted sum of PDA, Q_i^+ , and the weighted sum of NDS, Q_i^- , for all alternatives, as follows:

$$Q_i^+ = \sum_{j=1}^n w_j d_{ij}^+, \quad (8)$$

$$Q_i^- = \sum_{j=1}^n w_j d_{ij}^-, \quad (9)$$

where w_j denotes weight of the criterion j .

Step 4. Normalize the values of the weighted sum of the PDA and NDA, respectively, for all alternatives, as follows:

$$S_i^+ = \frac{Q_i^+}{\max_k Q_k^+}, \quad (10)$$

$$S_i^- = 1 - \frac{Q_i^-}{\max_k Q_k^-}, \quad (11)$$

where: S_i^+ and S_i^- denote the normalized weighted sum of the PDA and the NDA, respectively.

Step 5. Calculate the appraisal score S_i for all alternatives, as follows:

$$S_i = \frac{1}{2}(S_i^+ + S_i^-). \quad (12)$$

Step 6. Rank the alternatives according to the decreasing values of appraisal score. The alternative with the highest S_i is the best choice among the candidate alternatives.

4. NUMERICAL ILLUSTRATION

In order to perform comparative analysis of tourism potentials in Republic of Serbia and CEE and SEE countries, the indicators from The Travel & Tourism Competitiveness Report 2019 were used (Calderwood & Soshkin, 2019). This report is published by World Economic Forum (WEF) from 2007 to provide a tool for policymakers and other stakeholders to assess opportunities and anticipate disadvantages that can limit or the long-term prosperity and positive impact of the tourism sector in considered countries. It takes into consideration numerous indicators systematized in 14 pillars indicating the characteristics of environment for tourism development in any country. The current report considers 140 economies worldwide.

In this research, the data on following 9 indicators: Hotel rooms (C_1), Quality of tourism infrastructure (C_2), Number of World Heritage natural sites (C_3), Total protected areas (C_4), Natural tourism digital demand (C_5), Attractiveness of natural assets (C_6), Number of World Heritage cultural sites (C_7), Oral and intangible cultural heritage (C_8) and Cultural and entertainment tourism digital demand (C_9) are used as criteria for ranking. According to mentioned indicators, the ranking is performed for 13 alternatives representing the Republic of Serbia (A_1), Poland (A_2), Czech Republic (A_3), Slovak Republic (A_4), Romania (A_5), Bulgaria (A_6), Slovenia (A_7), Hungary (A_8), Albania (A_9), Bosnia and Herzegovina (A_{10}), North Macedonia (A_{11}), Croatia (A_{12}) and Montenegro (A_{13}). Initial dataset is presented in Table 1.

Table 5. Initial data

	C_1	C_2	C_3	C_4	C_5	C_6	C_7	C_8	C_9
A_1	0.40	4.30	0.00	6.60	1.00	4.50	5.00	3.00	1.00
A_2	0.40	4.60	1.00	38.10	13.00	4.40	14.00	1.00	18.00
A_3	1.30	5.00	0.00	22.20	12.00	4.30	12.00	6.00	5.00
A_4	0.70	4.40	2.00	37.60	4.00	5.10	5.00	6.00	2.00
A_5	0.80	3.70	2.00	24.30	8.00	5.10	6.00	7.00	7.00
A_6	1.70	4.60	3.00	28.30	19.00	5.00	7.00	7.00	5.00
A_7	1.10	4.70	2.00	55.10	19.00	5.90	2.00	4.00	5.00
A_8	0.80	4.80	1.00	22.60	4.00	4.50	7.00	6.00	7.00
A_9	0.60	4.50	1.00	13.50	15.00	5.60	2.00	1.00	2.00
A_{10}	0.50	3.70	0.00	1.40	2.00	4.60	3.00	3.00	8.00
A_{11}	0.40	3.20	1.00	9.70	1.00	4.20	1.00	5.00	1.00
A_{12}	1.90	4.90	2.00	23.60	85.00	6.00	8.00	17.00	21.00
A_{13}	2.70	5.10	1.00	4.20	15.00	5.90	3.00	0.00	2.00

Source: Travel & Tourism Competitiveness Report 2019

The criteria weights, obtained using the Entropy method and data shown in Table 1, are shown in Table 2.

Table 2. Weights of the evaluation criteria

	C_1	C_2	C_3	C_4	C_5	C_6	C_7	C_8	C_9
w_j	0.08	0.003	0.15	0.10	0.27	0.003	0.09	0.14	0.16

Source: Author's calculation

The average solution, calculated using Eq. (4) and Eq. (5), is shown in Table 3.

Table 3. The average solution

	C_1	C_2	C_3	C_4	C_5	C_6	C_7	C_8	C_9
x_j^*	1.02	4.42	1.23	22.09	15.23	5.01	5.77	5.08	6.46

Source: Author's calculation

In the following steps PDA and weighted sum of PDA are determined using Eq. (6) and Eq (8), as well as NDA and weighted sum of NDA, using Eq. (7) and Eq. (9). Values of PDA and weighted sum of PDA are shown in Table 4, while values for NDA and weighted sum of NDA are shown in Table 5.

Table 4. PDA and weighted sum of PDA

	C_1	C_2	C_3	C_4	C_5	C_6	C_7	C_8	C_9	Q_i^+
A_1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
A_2	0.00	0.00	0.00	0.08	0.00	0.00	0.13	0.00	0.29	0.49
A_3	0.02	0.00	0.00	0.00	0.00	0.00	0.10	0.02	0.00	0.14
A_4	0.00	0.00	0.09	0.07	0.00	0.00	0.00	0.02	0.00	0.19
A_5	0.00	0.00	0.09	0.01	0.00	0.00	0.00	0.05	0.01	0.17
A_6	0.06	0.00	0.21	0.03	0.07	0.00	0.02	0.05	0.00	0.44
A_7	0.01	0.00	0.09	0.16	0.07	0.00	0.00	0.00	0.00	0.32
A_8	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.02	0.01	0.06
A_9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
A_{10}	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.04
A_{11}	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
A_{12}	0.07	0.00	0.09	0.01	1.24	0.00	0.03	0.32	0.36	2.13
A_{13}	0.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.14

Source: Author's calculation

Table 5. *NDA and weighted sum of NDA*

	C_1	C_2	C_3	C_4	C_5	C_6	C_7	C_8	C_9	Q_i^+
A_1	0.05	0.00	0.15	0.07	0.25	0.00	0.01	0.06	0.14	0.73
A_2	0.05	0.00	0.03	0.00	0.04	0.00	0.00	0.11	0.00	0.23
A_3	0.00	0.00	0.15	0.00	0.06	0.00	0.00	0.00	0.04	0.24
A_4	0.03	0.00	0.00	0.00	0.20	0.00	0.01	0.00	0.11	0.35
A_5	0.02	0.00	0.00	0.00	0.13	0.00	0.00	0.00	0.00	0.15
A_6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.04
A_7	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.03	0.04	0.12
A_8	0.02	0.00	0.03	0.00	0.20	0.00	0.00	0.00	0.00	0.25
A_9	0.03	0.00	0.03	0.04	0.00	0.00	0.06	0.11	0.11	0.39
A_{10}	0.04	0.00	0.15	0.10	0.23	0.00	0.04	0.06	0.00	0.62
A_{11}	0.05	0.00	0.03	0.06	0.25	0.00	0.07	0.00	0.14	0.60
A_{12}	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
A_{13}	0.00	0.00	0.03	0.08	0.00	0.00	0.04	0.14	0.11	0.41

Source: Author's calculation

Finally, values of normalized weighted sum of the PDA and NDA, obtained using Eq. (10) and Eq. (11), as well as appraisal score, obtained using Eq. (12), are shown in Table 6.

Table 7. *Calculation details*

		S_i^+	S_i^-	S_i	Rank
A_1	Serbia	0.00	0.00	0.00	13
A_2	Poland	0.23	0.69	0.46	4
A_3	Czech Republic	0.07	0.67	0.37	6
A_4	Slovak Republic	0.09	0.52	0.31	8
A_5	Romania	0.08	0.80	0.44	5
A_6	Bulgaria	0.20	0.95	0.58	2
A_7	Slovenia	0.15	0.83	0.49	3
A_8	Hungary	0.03	0.66	0.35	7
A_9	Albania	0.00	0.47	0.24	10
A_{10}	Bosnia and Herzegovina	0.02	0.15	0.08	12
A_{11}	North Macedonia	0.00	0.17	0.09	11
A_{12}	Croatia	1.00	1.00	1.00	1
A_{13}	Montenegro	0.07	0.44	0.25	9

Source: Author's calculation

According to results presented in Table 6, it can be concluded that Republic of Serbia is ranked at the last – 13th position, indicating that this country has the most unfavorable conditions for tourism development. Such unfavorable position resulted from the fact that the Republic of Serbia has among the lowest values of all observed criteria. Especially negative aspects are Number of World Heritage natural sites, Natural tourism digital demand and Cultural and entertainment tourism digital demand where values of indicators are considerably lower than in most of observed countries. On the other hand, the best ranked country is Croatia that has advantage in most of criteria in relation to other observed economies. This country has done a lot for improvement conditions for tourism development during the last decade, especially after EU accession. Next economy according to observed criteria is Bulgaria, which occupies second position, and it is followed by Slovenia, Poland, Romania, Czech Republic, Hungary, Slovak Republic, Montenegro, Albania, North Macedonia and Bosnia and Herzegovina. It can be concluded that non-EU Member States are positioned at the last four positions in the final rankings, which indicate that they still have to reduce gap in comparison to EU countries.

CONCLUSION

Tourism is among the fastest growing industries worldwide, just after the manufacturing, and it is expected to grow in the future. Its contribution to growth and development is undoubtedly high, having in mind that somewhat more than 10% of global GDP is created in this activity and it has the same share in total employment in the world. However, the positive effects of this economic activity are mostly experienced by economies that created an enabling environment for its development. These shares are much lower in the Republic of Serbia, although the Republic of Serbia experienced the largest improvement in Europe in 2018 in The Travel & Tourism Competitiveness Report 2019. This indicates that there is significant room for progress in the future.

In the previous period, the Republic of Serbia has pursued strategies and policies aimed at boosting the growth of the tourism sector, related to substantial reduction in visa requirements, increased price competitiveness due to reduction of ticket prices, improvement of national air and ground transport infrastructure and airport taxes and increased overall tourism prioritization in strategic documents. Despite mentioned improvements, there are much more measures that need to be implemented to make Serbian tourism truly competitive. The government should continue addressing its weak natural and cultural resources, increase environmental sustainability to increase the attractiveness of its natural assets, make tourism service infrastructure more accommodating and reduce travel barriers by contracting more air service and trade agreements. The special attention should be paid to country online branding strategy, which is one of the key factors for improvement of its competitive position.

Having in mind that EU Member States are better positioned in the final rankings, the Republic of Serbia should use their experience in defining and implementation of tourism development strategy. The efficient benchmarking of practices used in mentioned countries, especially Croatia, Slovenia and Romania, can result in accelerated economic activity, employment and export in this sector. This will lead to long-term growth and development of Serbian economy as a whole.

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330.341.1(082)(0.034.2)

МЕЂУНАРОДНА научно-стручна конференција МЕФкон Иновације као покретач развоја (5 ; 2019 ; Београд)

Иновативна делатност - савремени изазови и решења [Електронски извор] : зборник радова са међународног скупа / [Пета] међународна научно-стручна конференција МЕФкон 2019 Иновације као покретач развоја, [Београд, 5. децембар 2019. године] ; [организатор] Факултет за примењени менаџмент, економију и финансије = Innovative Activities - Contemporary Challenges and Solutions : international conference proceedings / [Fifth] international scientific & professional conference MEFkon 2019, [Belgrade, December 5th 2019] ; [organizer] Faculty of Applied Management, Economics and Finance ; [уредници, editors Darjan Karabašević, Svetlana Vukotić]. - Београд : Факултет за примењени менаџмент, економију и финансије = Belgrade : Faculty of Applied Management, Economy and Finance, 2019 (Београд : Факултет за примењени менаџмент, економију и финансије). - 1 електронски оптички диск (CD-ROM) ; 12 cm : текст, слика

"Примерено теми и циљу научног скупа установљене су две сесије: I сесија: Иновације - темељ развоја (Тематски зборник) и II сесија: Иновативна делатност - напредак и будућност (Зборник радова са међународног скупа)." --> предговор. - Тираж 100. - Библиографија уз сваки рад.

ISBN 978-86-84531-45-4

а) Иновације -- Технолошки развој -- Зборници б) Знање -- Економија -- Зборници в) Предузећа -- Конкуренција -- Зборници г) Одрживи развој -- Зборници

COBISS.SR-ID 281352972