



ISSN 2217-9739  
eISSN 2560-3353  
No. 3-4/2023



# International Review Belgrade



Faculty of  
Business Economics  
and Entrepreneurship

filo DAL 2008  
diritto  
editore

[www.international-review.com](http://www.international-review.com)



International  
Review

**BELGRADE**

Editor

Academician Professor Mirjana Radovic Markovic, PhD



*FILODIRITTO*  
*INTERNATIONAL PROCEEDINGS*

filo DAL 2008  
diritto  
editore

Twice a Year Scientific Journal

ISSN 2217-9739  
COBISS.SR-ID 192516620  
ISBN 979-12-80225-77-1

**PUBLISHER**

Faculty of Business Economics and Entrepreneurship  
8 Mitropolita Petra Street  
11000 Belgrade, Serbia  
[www.vspep.edu.rs](http://www.vspep.edu.rs)

**CO PUBLISHER**

Filodiritto Editore (inFOROmatica S.r.l.)  
Via Castiglione 81  
40124, Bologna  
C.F./P.IVA 02575961202  
[www.filodirittoeditore.com](http://www.filodirittoeditore.com)

**EDITOR-IN-CHIEF**

*Academician Professor Mirjana Radovic Markovic, PhD*, Faculty of Business Economics and Entrepreneurship, Belgrade, Serbia

**ASSOCIATE-EDITORS**

*Associate Professor Sladjana Vujičić, PhD*, Faculty of Business Economics and Entrepreneurship, Belgrade, Serbia, [sladjana.vujcic@vspep.edu.rs](mailto:sladjana.vujcic@vspep.edu.rs)

*Associate Professor Zorana Nikitović, PhD*, Faculty of Business Economics and Entrepreneurship, Belgrade, Serbia

**EDITORIAL OFFICE**

Faculty of Business Economics and Entrepreneurship  
8, Mitropolita Petra str., Belgrade, Serbia  
Tel. +381 11 2762-194; fax: +381 11 2762-194  
[www.vspep.edu.rs](http://www.vspep.edu.rs), [international.review@vspep.edu.rs](mailto:international.review@vspep.edu.rs)

**BUSINESS SECRETARY**

*Milan Radičević*, Faculty of Business Economics and Entrepreneurship, Belgrade, Serbia

**PERSON RESPONSIBLE FOR PUBLISHING**

*Full Professor Gordana Djordjevic, PhD*, Director of Faculty of Business Economics and Entrepreneurship, Belgrade, Serbia

**EDITORIAL BOARD**

*Academician Professor Rajko Tomaš, PhD*, Faculty of Economics, Banja Luka, Bosnia and Herzegovina

*Academician Professor Slavko Karavidić, PhD*, Faculty of Business Economics and Entrepreneurship, Belgrade, Serbia

*Full Professor Carl Edwin Lindgren, PhD*, American School of Genealogy, Heraldry and Documentary Sciences, USA

*Full Professor Brenda Nelson-Porter, PhD*, Brigitte's Technology Consulting and Research Firm, USA

*Full Professor Ayinla Omolaja Muhammed, PhD*, International College of Management and Technology, Nigeria

*Full Professor Emine Demiray, PhD*, Anadolu University, Turkey

*Full Professor Nezameddin Faghieh, PhD*, Editor-In-Chief "Journal of Global Entrepreneurship Research" (JGER), Faculty of Entrepreneurship, University of Tehran, Iran

*Full Professor Radovan Pejanovic, PhD*, University of Novi Sad, Serbia

*Full Professor Adnan Rovčanin, PhD*, University of Sarajevo, Bosnia and Herzegovina

*Full Professor Radojko Lukić, PhD*, Faculty of Economics, University of Belgrade, Serbia

*Full Professor Snezhana Ilieva, PhD*, St. Kliment Ohridski University in Sofia, Bulgaria

*Full professor Rossitsa Chobanova, PhD*, Economic research institute, Bulgarian academy of sciences, Sofia, Bulgaria

*Full Professor Marianna Siničáková, PhD*, Technical University of Košice, Slovakia

*Full Professor Petar Veselinović, PhD*, Faculty of Economics, University of Kragujevac, Serbia

*Full Professor Boufeldja Ghat, PhD*, Faculty of Social Sciences Oran University, Oran, Algeria

*Full Professor José G. Vargas-Hernández PhD*, University Center for Economic and Managerial Sciences, University of Guadalajara, Guadalajara, Jalisco, México

*Full Professor Ballet Jérôme, PhD*, Center of Ethocs and Economics for Environment and Development in Madagascar, University of Antananarivo, Madagascar

*Full Professor Sreten Miladinovski, PhD*, MIT University, Skopje, Former Yugoslav Republic Macedonia

*Full Professor Cane Capragoski, PhD*, MIT University, Skopje, The Former Yugoslav Republic Macedonia

*Full Professor N Sandhya, PhD*, Nagarjuna College of Engineering & Technology, India

*Full Professor Marijan Stevanovski, PhD*, MIT University, Skopje, Former Yugoslav Republic Macedonia

*Full Professor Dragisa Stanujkic, PhD*, Technical Faculty Bor, University in Belgrade, Serbia

*Full Professor Edita Kastratović, PhD*, Faculty of Business Economics and Entrepreneurship, Belgrade, Serbia

*Full Professor Marija Čukanović Karavidić, PhD*, Ministry of Education, Science and Technological Development, Serbia

*Full Professor Ranko Bojanić, PhD*, Faculty of Technical Sciences, University of Novi Sad, Serbia

*Full Professor Maja Cogoljević, PhD*, Faculty of Business Economics and Entrepreneurship, Belgrade, Serbia

*Full Professor Milan Krstić, PhD*, Faculty of Business Economics and Entrepreneurship, Belgrade, Serbia

*Full Professor Petar Spalević, PhD* Faculty of Technical Science Kosovska Mitrovica, University of Pristina in Kosovska Mitrovica, Kosovska Mitrovica, Serbia

*Full Professor Dragana Vojteški - Kljenak, PhD*, Faculty of Business Economics and Entrepreneurship, Belgrade, Serbia

*Full professor Slavoljub Šljivić, PhD*, Faculty of Business Economics and Entrepreneurship, Belgrade, Serbia

*Full Professor Vlado Radić, PhD*, Faculty of Business Economics and Entrepreneurship, Belgrade, Serbia

*Associate Professor Isiaka Esema, PhD*, Pebble Hills University and Coordinator of International

Community Education Association, Nigeria Chapter, Nigeria  
*Associate Professor Bojana Novičević Čečević, PhD*, Faculty of Economics, University of Niš, Niš, Serbia  
*Associate Professor Chee Seng, Leow, PhD*, IIC University of Technology, Cambodia  
*Associate Professor Darko Vuković, PhD*, Tomsk Polytechnic University, Tomsk, Russia  
*Associate Professor Ljiljana Tomic, PhD*, Faculty of Pharmacy, University of Bijeljina, Bosnia and Herzegovina  
*Associate Professor Natalija Vuković, PhD*, Ural State Forest Engineering University, Yekaterinburg, Russia  
*Associate Professor Boro Krstić, PhD*, Faculty of Agriculture, University of Bijeljina, Bosnia and Herzegovina  
*Associate Professor Slađana Vujičić*, Faculty of Business Economics and Entrepreneurship, Belgrade, Serbia  
*Associate Professor Darjan Karabašević, PhD*, Faculty of Applied Management, Economics and Finance in Belgrade, University Business Academy in Novi Sad, Serbia  
*Associate Professor Jagadees S. Pandi, PhD*, Govt Arts College, Tamilnadu, India  
*Associate Professor Ljiljana Dimitrijević, PhD*, Faculty of Business Economics and Entrepreneurship, Belgrade, Serbia  
*Associate Professor Gabrijela Popović, PhD*, Faculty of Applied Management, Economics and Finance, University Business Academy in Novi Sad, Serbia  
*Associate Professor Zorana Nikitović*, Faculty of Business Economics and Entrepreneurship, Belgrade, Serbia  
*Associate Professor Brahmi Mohsen, PhD*, Department of Business Administration IAE G. Pau Institute Campus Scientific Gf.  
*Associate Professor Vladimir Ristanović, PhD*, Institute of European Studies, Belgrade, Serbia  
*Associate Professor Oliver Momčilović, PhD*, Faculty of Applied Management, Economics and Finance in Belgrade, University Business Academy in Novi Sad, Serbia  
*Associate Professor Vasileios Kallinterakis, PhD*, University of Liverpool, United Kingdom  
*Associate Professor Almir Peštek, PhD*, School of Economics and Business, Sarajevo, Bosnia and Herzegovina  
*Associate professor Aleksandra Tošović Stevanović PhD*, Institute of International Politics and Economics, Belgrade, Serbia  
*Associate Professor Dražen Jovanović, PhD*, Alfa BK University, Belgrade, Serbia  
*Associate Professor Milan Gavrilović, PhD*, Faculty of Business Economics and Entrepreneurship, Belgrade, Serbia  
*Associate Professor Gordana Gavrić, PhD*, Faculty of Business Economics and Entrepreneurship, Belgrade, Serbia  
*Assistant Professor Vladan Cogoljević*, Faculty of Business Economics and Entrepreneurship, Belgrade, Serbia  
*Assistant Professor Raghu Bir Bista, PhD*, Professor, Tribhuvan University, Nepal  
*Assistant Professor Sandra Mrvica Madjarac, PhD*, College of Applied Sciences "Lavoslav Ružička", Vukovar, Croatia  
*Assistant Professor Sandro Nuno Ferreira de Serpa, PhD*, University of the Azores, Portugal  
*Assistant Professor Muhammad Shoaib Farooq, PhD*, Universiti Malaysia Sarawak (UNIMAS), Malaysia  
*Assistant Professor Goran Perić, PhD*, Toplica Academy of Applied Studies, Department of Business Studies Blace, Blace, Serbia  
*Assistant Professor Helena Šlogar, PhD* Libertas International University, Zagreb, Croatia  
*Assistant Professor Agrawal Reena, PhD*, Jaipuria Institute of Management, Luckow, Uttar Pradesh, India  
*Assistant Professor Dušan Marković, PhD*, Belgrade Business and Arts Academy of Applied Studies (BBAA), Belgrade, Serbia  
*Assistant Professor Marko Gašić, PhD*, Toplica Academy of Applied Studies, Department of Business Studies Blace, Blace, Serbia  
*Assistant Professor Zélia Breda, PhD*, Department of Economics, Management and Industrial Engineering of the University of Aveiro, Aveiro, Portugal

*Assistant Professor Carmine D'Arconte, PhD*, Faculty of Economics, University of Rome Three, Italy

*Assistant Professor Neven Vidaković, PhD*, Zagreb School of Economics and Management, Croatia

*Assistant Professor Aidin Salamzadeh, PhD*, Faculty of Entrepreneurship, University of Tehran, Tehran, Iran

*Assistant professor Miroslav Nedeljkovic, PhD*, Institute of Agricultural Economics, Belgrade, Serbia

*Assistant professor Ahmed Rhif, PhD*, High Institute of Applied Sciences and Technologies (ISSAT Kairouan), Tunis

*Assistant Professor John Stocker, PhD*, University of Delaware Newark, USA

*Assistant Professor Tatjana Papić-Brankov, PhD*, Institute of Agricultural Economics, Belgrade, Serbia

*Assistant professor Mirjana Nikolic, PhD*, Faculty of Psychology, University of Bijeljina, Bosnia and Herzegovina

*Assistant Professor Vladan Pantović, PhD*, Faculty of Information Technology and Engineering Union University - Nikola Tesla, Belgrade, Serbia

*Assistant Professor Biljana Dimitric, PhD*, Faculty of Psychology, University of Bijeljina, Bosnia and Herzegovina

*Assistant Professor Jelena Raičević, PhD*, Toplica Academy of Applied Studies, Department of Business Studies Blace, Serbia

*Hiroko Kawamorita Kesim*, Ondokuz Mayıs University, Turkey

*Assistant Professor, Mihajlo Ranisavljević, PhD*, Military Technical Institute, Belgrade, Serbia

**PUBLISHING BOARD**

**Full Professor Gordana Djordjević, PhD**, Director of Faculty of Business Economics and Entrepreneurship, Belgrade, Serbia

**Academician Professor Mirjana Radović-Marković, PhD**, Faculty of Business Economics and Entrepreneurship, Belgrade, Serbia

**Assistant Professor Dušan Cogoljević, PhD**, president of Faculty of Business Economy and Entrepreneurship, Belgrade, Serbia

**Academician Professor Slavko Karavidić, PhD**, Faculty of Business Economics and Entrepreneurship, Belgrade, Serbia

**Full Professor Sofronija Miladinovski, PhD**, Faculty of Tourism and Hospitality, Ohrid, Former Yugoslav Republic Macedonia

Printing 300 copies

CIP - Каталогизација у публикацији Народна библиотека Србије, Београд

37+33+327

INTERNATIONAL review / editor-in-chief Mirjana Radović-Marković. - 2012, no. 1/2- . - Belgrade: Faculty of Business Economics and Entrepreneurship; Pianoro: Medimond, 2012- (Valjevo: Valjevo print). - 24 cm

Dva puta godišnje

ISSN 2217-9739 = International review (Faculty of Business and Entrepreneurship) COBISS.SR-ID 192516620

Copyright© 2023

by Faculty of Business Economics and Entrepreneurship, Belgrade.

All rights reserved

## Notes from the Editor-in-Chief



Editor-in-Chief

Scientific journal *International Review* has been published since 2012 as a modernly designed and technically arranged according to the Act of editing of the Ministry of education, science, and technological development of the Republic of Serbia. From this year, we are particularly pleased to announce that the Journal has received an impact factor of **0.6** and got a category of **M 23**. I expect that this categorization will influence the sending of higher quality papers, and the authors should also expect selection based on a relevance and scientific rigor. In addition, I want to emphasize that due to the large number of papers received, the publication of accepted ones takes at least six months.

The invitation for new reviewers, other associates and guest editors is constantly open. According to this policy of the journal we are looking forward to your applications and welcome your useful suggestions.

We kindly ask you to quote papers from our journal properly, as well as to send us the papers that have not been published.

I thank you in advance and invite you to become a part of our great team of associates, if you have not done that by now.

Belgrade, December 2023.

Yours,  
Editor-in-Chief  
*Acad. Prof. Dr. Mirjana Radović-Marković*



## CONTENT

### **PART I.**

#### **ORGANIZATIONAL RESILIENCE AND SMALL BUSINESS DEVELOPMENT..... 13**

#### **STRATEGIC ORGANIZATIONAL RESILIENCE DURING AND AFTER THE COVID-19: CASE STUDY OF WESTERN BALKANS .....15**

RADOVIĆ-MARKOVIĆ Mirjana, MARKOVIĆ Dušan, VUČEKOVIĆ Miloš, CHOU Zanadu Linjie

#### **DEVELOPING AN ANALYSIS MODEL FOR COMMUNICATING ETHICAL RESPONSIBILITY .....25**

TRIŠIĆ Marko, DORDEVIĆ Bojan, SKORUP Ana, SKORUP Srđan

### **PART II**

#### **CAREER DEVELOPMENT, EDUCATION AND EMPLOYMENT..... 35**

#### **ANALYSIS OF INNOVATION AND CREATIVITY IMPACT ON THE ENTREPRENEUR CAREER DEVELOPMENT.....37**

JANOŠIK Marija, MOMČILOVIĆ Oliver, VUJIČIĆ Slađana

#### **CRITICAL ANALYSIS OF THE MANNERS OF ESTABLISHMENT AND EXTENSION OF EMPLOYMENT RELATIONSHIPS OF EMPLOYEES IN HIGHER EDUCATION OF THE REPUBLIC OF SERBIA .....49**

DABIĆ Sandra, URDAREVIĆ Bojan, RADULOVIĆ Zoran

#### **INTERPLAY BETWEEN TECHNOLOGY AND SOCIETY: EFFECTS OF REMOTE EMERGENCY TEACHING ON UNDERGRADUATE STUDENTS' PERFORMANCE.....54**

ŠTILIĆ Anđelka, Krstić Boro, PUŠKA Adis, NICIĆ Miloš

#### **FINANCIAL BEHAVIOR AND LITERACY OF STUDENTS IN RUSSIAN HIGHER EDUCATION INSTITUTIONS .....65**

ILYASHENKO LUBOV Kiryalovna, LYUSHNENKO MARIA Eldarovna

#### **RESEARCH ON THE LEVEL OF FINANCIAL LITERACY OF STUDENTS: THE CASE OF MOSCOW POLYTECHNIC UNIVERSITY .....71**

PANOVA Elena, VASLAVSKAYA Irina, BASHKIROVA Kristina, FROLOVA Natalia, SEMIKIN Dmitriy, SEMIKINA Yulia

#### **GUIDING PRINCIPLES FOR FOSTERING ECONOMIC GROWTH IN PRIVATE SECONDARY SCHOOLS ILLUSTRATION THROUGH THE BUSINESS MODEL GENERATION.....81**

PENJIŠEVIĆ Aleksandra, NIKITOVIĆ Zorana, SOMBORAC Borko, D'Arconte Carmine

#### **THE EFFECT OF INTERNAL MARKETING ON EMPLOYEES' ORGANIZATIONAL COMMITMENT THROUGH THEIR JOB SATISFACTION: THE CASE OF HEALTHCARE SECTOR IN SERBIA.....92**

JOVANOVIĆ Vesna, NJEGIĆ Katarina, MILANOVIĆ Vesna

<b><i>PSYCHOSOCIAL FACTORS OF SUCCESSFUL ADAPTATION TO REMOTE WORK IN THE WESTERN BALKANS.....</i></b>	<b><i>101</i></b>
RADULOVIĆ Sofija, DIMITRIJEVIĆ Ljiljana, NIKOLIĆ-ILIC Žaklina, SILVER KYARUZI Imani	
<b><i>THE ROLE OF THE LEADER IN TEAMWORK.....</i></b>	<b><i>111</i></b>
ARSENIJEVIĆ Olja, KASTRATOVIĆ Edita, PODBREGAR Iztok	
<b><i>PART III</i></b>	
<b><i>INVESTMENT AND THE DIGITAL ECONOMY.....</i></b>	<b><i>123</i></b>
<b><i>UNDERSTANDING THE DYNAMICS OF INVESTMENT FACTORS AND EXCHANGE-TRADED FUNDS PERFORMANCE IN THE U.S. MARKET 2018-2022 .....</i></b>	<b><i>125</i></b>
KORENAK Boris, STAKIC Nikola, VESIC Tamara	
<b><i>CONTROVERSIES OF FOREIGN DIRECT INVESTMENTS - THE CASE OF SERBIA.....</i></b>	<b><i>136</i></b>
BESLAC Milan, COGOLJEVIC Vladan , JANJUSIC Dragan	
<b><i>ECONOMETRIC ANALYSIS OF THE COVID-19 PANDEMIC IMPACT OF THE ON FOREIGN INVESTORS PARTICIPATION IN STOCK TRADING IN THE REPUBLIC OF SERBIA .....</i></b>	<b><i>146</i></b>
BARJAKTAROVIĆ Miljana, STANKOVIĆ Sunčica, MILOJEVIĆ Nataša	
<b><i>DIGITAL TRANSFORMATION OF BUSINESS THROUGH E-COMMERCE IN SMALL AND MEDIUM-SIZED ENTERPRISES (SME'S) .....</i></b>	<b><i>154</i></b>
JAKŠIĆ Krsto, TRAJKOVIĆ Slaviša, DELETIĆ Milan DELETIĆ Velimir	
<b><i>HUMAN RESOURCE MANAGEMENT DIGITALIZATION.....</i></b>	<b><i>163</i></b>
KALAVAKOLANU Sripathi, PRASAD kv	
<b><i>DIGITAL CURRENCY AS A TOOL FOR REDUCING INFORMATION ASYMMETRY (START-UPS' FINANCING EXAMPLE) .....</i></b>	<b><i>172</i></b>
KORABLEVA Olga, KALIMULLINA Olga	
<b><i>ANALYSIS OF THE EFFICIENCY OF BANKS IN SERBIA AND MONTENEGRO USING THE DEA METHOD .....</i></b>	<b><i>184</i></b>
SIMONOVIĆ Dragoljub, MILOJEVIĆ Stefan, MILAŠINOVIĆ Marko, DIMITRIJEVIĆ Mladan	
<b><i>A BOOTSTRAP EFFICIENCY ANALYSIS BASED ON ECONOMIC SENSITIVITY FOR THE FIRST TERM OF COVID-19.....</i></b>	<b><i>195</i></b>
TOPČUOĞLU Özlem, BOZKURT Eda, ALTINER Ali	
<b><i>PART IV</i></b>	
<b><i>TOURISM, TRADE AND PRODUCTION.....</i></b>	<b><i>203</i></b>
<b><i>IMPACT OF THE EVENT ON THE SUSTAINABILITY OF THE TOURIST DESTINATION - PERCEPTION AND ATTITUDES OF THE LOCAL POPULATION.....</i></b>	<b><i>205</i></b>
RUDANČIĆ Andreja, GUZOVSKI Marina, SMOLJIĆ Mirko	
<b><i>ANALYSIS AND PREDICTION OF TOURIST TRAFFIC IN THE REPUBLIC OF SERBIA AFTER THE PANDEMIC .....</i></b>	<b><i>213</i></b>
GAJIĆ Tamara, ZRNIĆ Miloš, VUKOLIĆ Dragan	

---

<b><i>THE ROLE OF TRADE POLICY IN ENABLING ACCESS TO COVID-19 VACCINES.....</i></b>	<b><i>223</i></b>
POPOVIĆ PETROVIĆ Ivana	
<b><i>CONVENTIONAL OR ORGANIC PRODUCTION IN KOSOVO AND METOHIJA - PROSPECTS AND CHALLENGES.....</i></b>	<b><i>231</i></b>
BOJIĆ Radica, TRIPKOVIĆ Anđelka, MLADENOVIĆ Maja	
<b><i>PROCEDURAL LEGITIMATION OF PRIVATE PARTIES BEFORE THE COURT OF JUSTICE OF THE EU IN THE LIGHT OF CARVALHO CASE.....</i></b>	<b><i>239</i></b>
VLAJNIĆ Jelena, SPASOJEVIĆ Dorde	
<b><i>INSTRUCTION TO AUTHORS.....</i></b>	<b><i>249</i></b>
<b><i>LIST OF THE REVIEWERS .....</i></b>	<b><i>250</i></b>



## **PART I.**

# **ORGANIZATIONAL RESILIENCE AND SMALL BUSINESS DEVELOPMENT**



# STRATEGIC ORGANIZATIONAL RESILIENCE DURING AND AFTER THE COVID-19: CASE STUDY OF WESTERN BALKANS

RADOVIĆ-MARKOVIĆ Mirjana<sup>1</sup>, MARKOVIĆ Dušan<sup>2</sup>, VUČEKOVIĆ Miloš<sup>3</sup>,  
CHOU ZANADU Linjie<sup>4</sup>

<sup>1</sup>University Business Academy, Novi Sad (SERBIA)

<sup>2</sup>Belgrade Business and Arts Academy of Applied Studies (SERBIA)

<sup>3</sup>University Singidunum, Belgrade (SERBIA)

<sup>4</sup>Jagiellonian University, Krakow, (POLAND)

E-mails: [mradovic@gmail.com](mailto:mradovic@gmail.com), [dusanbps@gmail.com](mailto:dusanbps@gmail.com), [milosvu@gmail.com](mailto:milosvu@gmail.com)

## ABSTRACT

*The COVID-19 pandemic has affected businesses globally. It swept the world like a wave, changing and adapting economies around the world. However, many businesses have shown remarkable resilience in the face of this crisis, adapting to changing circumstances and finding new ways to serve their customers. To build resilience, people need to understand organizational change. In this study, the authors only explained the organizational aspects of resilience in the Western Balkans. They emphasized that there is a lack of research investigating resilience in the context of venture failure due to the inability to respond to the demands of crisis conditions. Therefore, they study the association between corporate responses that we consider particularly important during this crisis, in relation to labor practices, to determine whether companies experienced less-negative responses to the crisis during the market collapse. The aim of these studies is to highlight the importance of the need to improve resilience after the COVID-19 crisis and to determine strategies for achieving it. For this purpose, extensive literature was used, which represents the theoretical framework of the research. Based on their research, the winners in the changing business environment will be unbridled firms that respond to challenges and create new opportunities.*

**Keywords:** organization, resilience, business continuity, Western Balkans

**JEL:** L32, F6, F64

**DOI:** 10.5937/intrev2304015R

**UDC:** 616.98:578.834]:338

005.332.8:334.7(497-15)

**COBISS.SR-ID** 133863433

## INTRODUCTION

Organizational resilience refers to the organization's ability to quickly adapt to changes in the environment in order to continue operating. Resilience can be viewed not only from the aspect of the individual, organization, and society. In this study, only the organizational aspects of resilience are considered [1]. Building a resilient company should be a strategic initiative that affects the company's functioning and increases its competitiveness [2]. These authors suggest that firm resilience can be achieved by reducing sensitivity to change and increasing flexibility, which indicates the firm's ability to get back on track in the event of disruption.

Speaking about the organizational resilience of small and medium-sized enterprises, some authors make a distinction between large and small enterprises [3]. They believe that small and medium-sized enterprises are more vulnerable than large enterprises, given that risk management is not included in their business strategy. Namely, larger organizations are better organized than small and medium-sized ones, because they have more resources and greater technical knowledge. Moreover, there are no strategic programs for the operationalization of action plans for small and medium enterprises. Statistics also show that SMEs are less resilient than large enterprises. However, SMEs tend to be quicker to respond, even if their responses are not coordinated. The reason for this is a very simplified decision-making structure. In addition to responding quickly to shocks, entrepreneurs should take into account the high failure rate of small businesses in view of this and pay more attention to liquidity, cash flows and seasonal fluctuations [4].

One of the key factors driving venture resilience during the COVID-19 pandemic has been the ability to leverage technology [29]. Companies that were already using digital tools to streamline their operations and connect with customers were better positioned to weather the storm than those that relied heavily on traditional, in-person interactions. This has been particularly true in sectors like e-commerce, where online shopping has surged during the pandemic, and remote work, where companies with strong digital infrastructure were able to quickly shift to a fully remote workforce.

Another key factor has been agility and adaptability. Ventures that were able to pivot quickly in response to changing circumstances were more likely to survive and thrive during the pandemic. This has involved everything from developing new products and services to adjusting pricing and distribution strategies to accommodate changing consumer preferences.

Finally, many ventures have benefited from government stimulus measures and other forms of financial support. This has helped to cushion the impact of the pandemic and allowed businesses to keep their doors open even during times of significant economic uncertainty.

The goal of this research is to point out the impossibility of responding to the demands of crisis conditions and the importance of the need to improve resilience after the COVID 19 crisis, determining strategies for its achievement and defining winners in a changing business environment.

## HYPOTHESES

Long before the onset of the pandemic, researchers began to explore the importance of education for risk management. Based on the results, disaster education is a functional, operational and cost-effective risk management tool [24]. In accordance with this research, we tried to test this hypothesis on the example of the countries of the Western Balkans and to determine how education determines the awareness of the importance of resilience for organizational functioning and business stability (H0).

Hypothesis H0: The level of education affects good preparedness in the event of disasters occurring outside of working hours.

Hypothesis H0: The level of education affects the opinion of good measures to prepare for a disaster outside of working hours.

IT resilience is defined in the literature as an important component of business stability and disaster recovery [25], [28]. However, despite the fact that scholars understand the importance of IT resilience, there is no evidence whether employees and employers are aware of it and whether IT resilience is incorporated into the plans and business strategies of organizations. With this in mind, we wanted to explore how the importance of IT resilience for sustainability and business continuity is understood (H1).

Hypothesis H1: Respondents understand the importance of IT resilience in business continuity planning.

## LITERATURE OVERVIEW

This article presents various viewpoints related to organizational resilience. The literature on organizations uses the term “resilience” as a versatile and multidimensional concept [5]. In the context of strategic management and changes, resilience is the ability of self-renewal over time through innovations [6]. Furthermore, the building of organizational resilience is connected to employees and management [7], [8], [9], who work in the learning organization. In addition, resilience implies the adaptation of organization strategy [10],[11], as well as a solution for organizations having a high level of threat in all aspects of their work environment [1].

One of the most significant challenges facing businesses in the EU is the COVID-19 pandemic, which has had a major impact on the economy and disrupted global supply chains. To adapt to this changing environment, many companies are focusing on building resilience by implementing new business models, enhancing supply chain resilience, and adopting new technologies. A recent report from the European Parliament highlights the importance of digital transformation for business resilience, with a focus on cybersecurity, data protection, and the use of artificial intelligence [13]. The report also emphasizes the need for businesses to adopt a circular economy model, which involves reducing waste and promoting the reuse of resources. Besides this report, there have been numerous studies on the business resilience after Covid-19. Here are some key reputable sources:

A research published by the Kauffman Foundation in 2022 highlighted the importance of financial resilience for entrepreneurs [14]. The brief emphasized the need for entrepreneurs to build up financial reserves and maintain strong relationships with lenders and investors in order to weather economic downturns and other unexpected events. A survey conducted by McKinsey & Company [15] in August 2021 found that 90% of executives believed that their companies had become more resilient due to the pandemic. Also, the survey showed that the future will belong to companies that put technology at the center of their outlook, capabilities, and leadership [15].

According to a report by the World Economic Forum 55% of businesses surveyed had increased their investment in digital transformation in response to the pandemic [16]. Namely, waves of COVID-19 pandemic response have accelerated digital transformation and technology adoption, and transformed many sectors through new workplace planning and talent management. Further, studies by the Harvard Business Review and McKinsey Global Surveys found that companies with higher levels of digital maturity were better equipped to adapt to the pandemic and were more likely to have experienced growth [17], [18].

A report by the US Chamber of Commerce published in March 2021 found that 90% of small businesses reported having made changes to their operations due to the pandemic, with 58% reporting that they had made significant changes [19].

A survey by KPMG published in November 2020 found that 94% of companies had made changes to their business model in response to the pandemic, with 61% reporting that they had accelerated their digital transformation plans [20]. The study defined a growth mindset as the belief that abilities and traits can be developed through hard work and dedication.

One number of authors considered “capabilities” and their importance for a resilient response [11], [23]. They noted that capabilities include skills, knowledge, and access to resources. Overall, these studies suggest that organizations' resilience is influenced by a variety of factors, including mindset, emotional intelligence, skills, social support, access to resources and financial stability [30].

## METHOD OF THE STUDY

The study was conducted in four Western Balkan countries (Figure 1).



*Figure 1. Location of the study area*

The present research was conducted in the Serbia, Bosnia and Herzegovina, Montenegro and Northern Macedonia. At the end of the year 2019, the research was started and has completed in October 2021.

The methodology of our paper is based on qualitative and quantitative research. Namely, we used the methods of analysis and synthesis as well as the method of deduction for the interpretation of the obtained data. The Kolmogorov Smirnov and Pearson's Chi-square test were applied.

### *Data Collecting Procedure and Statistical Technique*

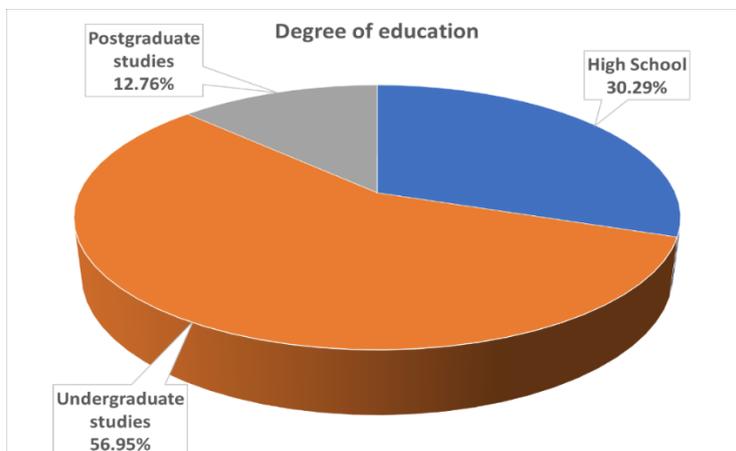
In this study, data were collected using multiple methods, including a literature review. The interviewer selected the respondents based on their availability. Before the interview, the researchers described the meaning of the study and its context to the participant. We used open-ended and closed-ended questions. Further, the research is also based on our previous research. A web survey was used, which contains a structured questionnaire of 22 questions. Before sending the survey, the respondents were explained the importance of the research and its context. In addition, a comparative method was used, which served to compare the results of the research obtained in this way and put them in relation to the collected data for four countries. Another method of analysis and synthesis has found its application in this study. Namely, the quantitative methods, the Kolmogorov-Smirnov test was also used. Descriptive analyses, such as range, number, percentage, mean, standard deviation, and ranking order, were used whenever possible.

Upon completion of the survey, the collected data were coded, tabulated and analysed in accordance with the conceptual framework and objectives of the study. Descriptive techniques were used to analyse the collected data using appropriate software, such as SPSS and Microsoft Excel.

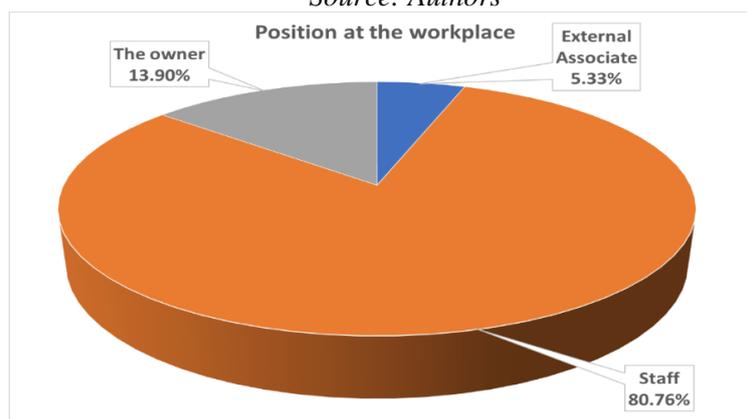
## KEY FINDINGS AND DISCUSSION

The study was conducted during the COVID-19 pandemic. Bearing in mind the obvious indicators of a decrease in economic activity of organizations by declaring a state of emergency and restrictive working time and social distance after its cessation of operation, one of the important questions was "Which of the next good measures for preparing for a disaster outside of working hours?" and "Where does IT resilience fit most into business continuity planning?". The respondents were of different levels of education (Figure 2), in different business positions (Figure 3) as well as different lengths of engagement at work (Figure 4).

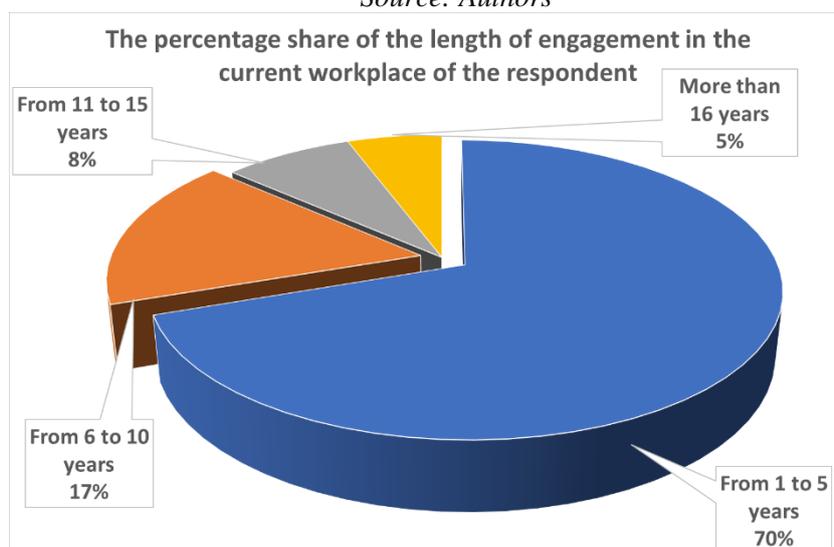
Distribution of frequency answers to the question "Which of the following good measures for preparing for a disaster outside working hours", is shown in Figure 4. It can be noted that the largest number of answers is "Ensuring that all team members have permanent access to the company through networks electronically", which in percentage amounts to 43.05%, while only 19.43% of respondents believe that such situations will not occur, obviously not recognizing the moment they are in, nor the advantages of forming such steps that would enable better resilience of the enterprise.



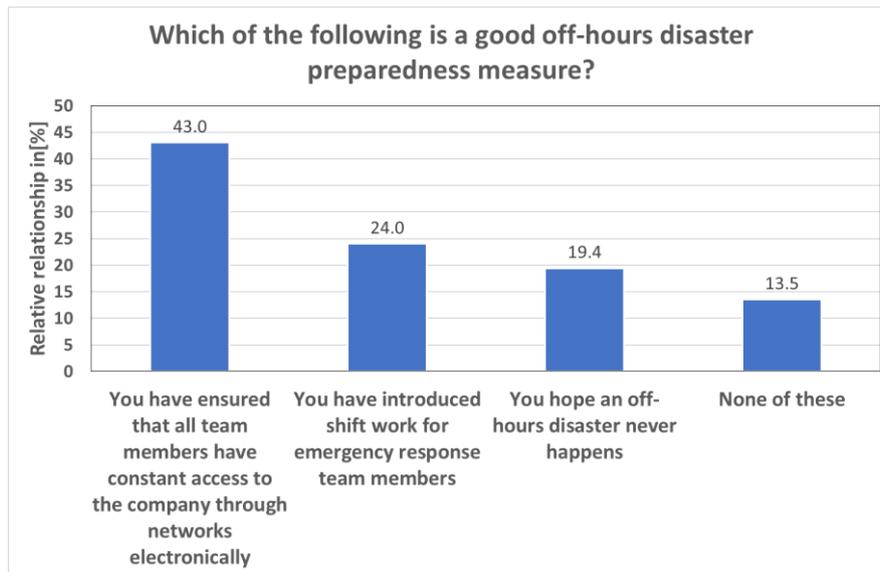
**Figure 2.** Distribution of the sample according to the level of education  
Source: Authors



**Figure 3.** Distribution of the sample in relation to the work position at the workplace  
Source: Authors



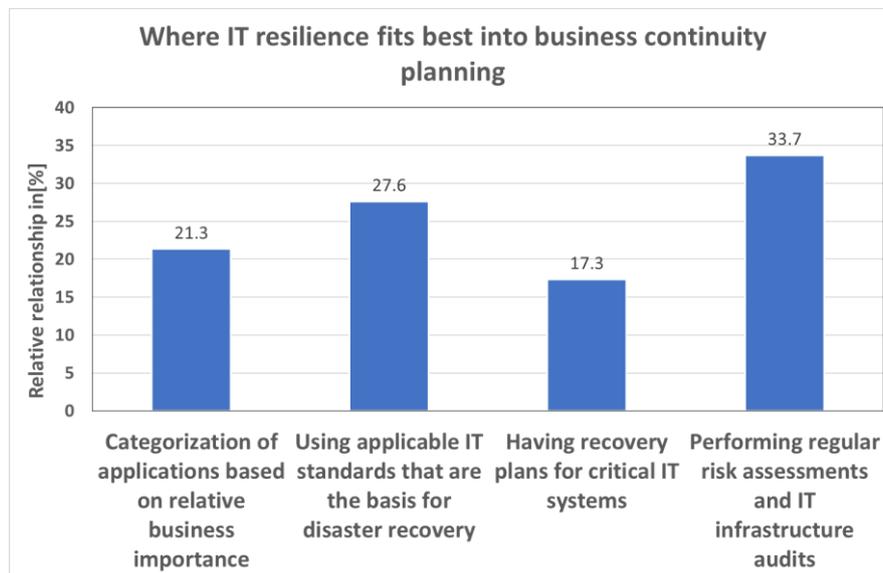
**Figure 4.** Sample distribution in relation to length engagement in the respondent's current workplace  
Source: Authors



**Figure 5.** Distribution of responses to the question "Which of the following is a good off-hours disaster preparedness measure?"

Source: Authors

When asked about the integration of IT resilience into business continuity planning, the majority of respondents answered "Performing regular risk assessments and IT infrastructure audits" (33.71%) (Figure 6), while 27.62% of respondents answered "Using applicable IT standards which are the basis for disaster recovery".



**Figure 6.** Distribution of responses to the question "Where does IT resilience best fit into business continuity planning?"

Source: Authors

Using the Kolmogorov-Smirnov test for all variables, the results were tested for normal distribution (Table 1).

**Table 1. Kolmogorov-Smirnov test results**

Variables	Level of significance	The result
Degree of education	0,000	Hypothesis H is rejected
Way of engaging in the workplace	0,000	Hypothesis H is rejected
Length of engagement in the current workplace	0,000	Hypothesis H is rejected
Which of the following is a good off-hours disaster preparedness measure?	0,000	Hypothesis H is rejected
Where does IT resilience best fit into business continuity planning?	0,000	Hypothesis H is rejected

Source: Authors

The obtained results show that the null hypothesis about the normality of the size distribution is rejected for all variables, so further testing of the initial hypothesis can be carried out using non-parametric testing.

To test the initial hypothesis H about the type of influence of variables on responses in relation to individual dimensions, Pearson's Chi-square test was used (Table 2).

**Table 2. Testing Pearson's Chi-square test**

Hypothesis	Dimension	Variables	Level of significance	The result
H <sub>0</sub> : The level of education affects the opinion of good measures to prepare for a disaster outside of working hours.	Which of the following is a good off-hours disaster preparedness measure?	Degree of education	0,025	Hypothesis H is rejected
		Way of engaging in the workplace	0,317	Hypothesis H is accepted
		Length of engagement in the current workplace	0,341	Hypothesis H is accepted
H <sub>1</sub> : Respondents understand the importance of IT resilience in business continuity planning.	Where does IT resilience best fit into business continuity planning?	Degree of education	0,511	Hypothesis H is accepted
		Way of engaging in the workplace	0,594	Hypothesis H is accepted
		Length of engagement in the current workplace	0,087	Hypothesis H is accepted

Source: Authors

From the table shown above, it is noticed that only the first variable related to the level of education of respondents and the first dimension "Which of the following good measures for preparing for a disaster outside working hours?" have a mutual dependence at a significance level of 0.025. Since their contingent coefficient is 0.323, which is low to mean, the hypothesis H<sub>0</sub> "The level of education influences the opinion of good measures for preparing for disaster outside working hours" is confirmed. The other two variables that are associated with business processes "Method of engagement in the workplace" and "Length of engagement in the workplace" are not related to responses. The second hypothesis H<sub>1</sub> "Respondents understand the importance of IT resilience in business continuity planning" has not been confirmed since all three variables do not affect the values of dimension results. In addition, our research has shown that the poor IT resilience is not an outcome of the COVID-19 pandemic, though the crisis certainly made an impact on it.

## CONCLUSION

In recent years, research is looking in new directions. In that manner, it is important to detect whether an organization has resilience potential. According to our research the hypothesis  $H_0$  "The level of education influences the opinion of good measures for preparing for disaster outside working hours" is confirmed, while other hypothesis  $H_1$  "Respondents understand the importance of IT resilience in business continuity planning" is rejected. Without IT resilience, businesses cannot respond to internal and external stressors. This leads to the collapse of business. Therefore, it is necessary that the strategy of resilience emphasizes on the awareness of organizations about the range and impacts of dangerous events affects their recovery priorities and business continuity. Namely, while the COVID-19 pandemic has certainly presented significant challenges for ventures around the world, many have shown remarkable resilience and adaptability in the face of these challenges. The COVID-19 pandemic has had a profound impact on organizations, highlighting the need for resilience and adaptability. According to our research we can recommend some key steps that organizations can take to develop resilience strategy in the face of future crises:

*Develop a crisis management plan:* A crisis management plan should be in place to help organizations respond quickly and effectively to any unexpected events. This plan should outline the roles and responsibilities of each team member and provide clear guidelines for communication, decision-making, and resource allocation.

*Foster a culture of resilience:* Organizations should cultivate a culture that encourages resilience, adaptability, and innovation. This includes encouraging employees to speak up, take risks, and share ideas.

*Invest in technology:* Organizations should invest in technology that enables remote work, collaboration, and communication. This includes cloud-based software, video conferencing tools, and project management software.

*Diversify supply chains:* The pandemic highlighted the importance of diversifying supply chains to reduce risk. Organizations should consider sourcing materials and products from multiple locations and suppliers to ensure continuity of operations.

*Focus on employee well-being:* The pandemic has taken a toll on employee well-being, which can impact productivity and performance. Organizations should prioritize employee well-being by providing resources and support for mental health, stress management, and work-life balance.

*Maintain financial stability:* Organizations should maintain financial stability by building up cash reserves, managing debt, and diversifying revenue streams.

*Learn from past experiences:* Finally, organizations should learn from past experiences and use them to inform future decision-making. This includes conducting post-crisis reviews and incorporating feedback into future plans and strategies.

By leveraging technology, staying agile, and taking advantage of government support measures, many businesses have been able to weather the storm and emerge stronger on the other side.

## REFERENCES

- [1] Radović Marković, M., Shoaib Farooq, M., Marković, D., (2017). Strengthening the resilience of small and medium-sized enterprises. Y: TAKÁCS, István (ur.). Management, enterprise and benchmarking in the 21st century IV: "Global challenges, local answers". Budapest: Óbuda University, 2017, str. 345-356, graf. prikazi, tabele. <http://ebooks.iien.bg.ac.rs/1119/1/meb.pdf>.
- [2] Sheffi, Y. and Rice Jr, J. B. (2005). A supply chain view of the resilient enterprise. *MIT Sloan Management Review*, 47 (1), 41–48.
- [3] Sullivan-Taylor, B., & Wilson, D. C. (2009). Managing the threat of terrorism in British travel and leisure organizations. *Organization Studies*, 30(2–3), 251–276.
- [4] Smith, E. (2016). Risk & Resilience Manager: Building Resilience in SME's, Oakpark Security, United Kingdom. <http://www.oaksec.co.uk/building-resilience-in-smes>
- [5] Ponomarov, S.Y. and Holcomb, M.C., (2009). Understanding the concept of supply chain resilience. *International Journal of Logistics Management*, 20 (1), 124–143.
- [6] Reinmoeller, P., & Van Baardwijk, N. (2005). The link between diversity and resilience. *MIT Sloan Management Review*, 46(4), 61–65.
- [7] Mallak, L., (1999). Toward a theory of organizational resilience. In: Portland International Conference on Technology and Innovation Management. PICMET. Portland, OR: IEEE.
- [8] Patterson, E.S., et al., (2007). Collaborative cross-checking to enhance resilience. *Cognition, Technology & Work*, 9, 155–162.
- [9] Vogus, T.J. and Sutcliffe, K.M. (2007). Organizational resilience: towards a theory and research agenda. IEEE Conference on Systems, Man and Cyber. Available at: Organizational resilience: Towards a theory and research agenda | IEEE Conference Publication | IEEE Xplore [accessed Jan 25, 2023].
- [10] Beermann, M. (2011). Linking corporate climate adaptation strategies with resilience thinking, *Journal of Cleaner Production*, Volume 19, Issue 8, May 2011, pp. 836–842.
- [11] Radović Marković, M., Tomas, R., (2019). GLOBALISATION IMPACT ON ENTREPRENEURSHIP IN SMALL COUNTRIES, Abingdon, Oxon; New York, NY: Routledge, 2019., 189 p.
- [12] Radović Marković, M., (2023). Principles of Management and Leadership in a Global World, Silver & Smith, Birmingham.
- [13] European Parliament, (2022). Digital transformation: importance, benefits and EU policy. Available at: <https://www.eumonitor.eu/9353000/1/9vvik7m1c3gyxp/vli6iyjgcqzh?ctx=vg9pj7ufwbwe>
- [14] Kauffman Foundation (2022). COVID-19 and Entrepreneurial Firms: Seeding an Inclusive and Equitable Recovery. Available at: <https://www.kauffman.org/entrepreneurship/reports/inclusive-equitable-recovery-covid-19-policy/>
- [15] McKinsey Global Surveys, (2021), Building workforce skills at scale to thrive during—and after—the COVID-19 crisis. Available at : <https://www.mckinsey.com/~media/mckinsey/featured%20insights/mckinsey%20global%20surveys/mckinsey-global-surveys-2021-a-year-in-review.pdf>
- [16] WEF Annual Report 2021-2022. (2022). Available at: [https://www3.weforum.org/docs/WEF\\_Annual\\_Report\\_2021\\_22.pdf](https://www3.weforum.org/docs/WEF_Annual_Report_2021_22.pdf)
- [17] Narayandas, D., Vinay, H. and Liangliang, L. (2020). Lessons from Chinese Companies' Response to Covid-19, *Harvard Business Review*. Available at: <https://hbr.org/2020/06/lessons-from-chinese-companies-response-to-covid-19?ab=hero-subleft-1>
- [18] McKinsey Global Surveys (2021). The new digital edge: Rethinking strategy for the postpandemic era. Available at: <https://www.mckinsey.com/capabilities/mckinsey-digital/our-insights/the-new-digital-edge-rethinking-strategy-for-the-postpandemic-era>
- [19] Choi, J. (2021). Chamber of Commerce: Worker shortage crisis deepening. Available at: <https://thehill.com/policy/finance/economy/556235-chamber-of-commerce-worker-shortage-crisis-deepening/>
- [20] KPMG (2020). Emerging from COVID-19 into the new world of work.
- [21] Radović Marković, M., Tomaš, R. (2018). Resilience of Small and Medium-Sized Enterprises in Terms of Globalization: An Evidence of Serbia. *International Journal of Entrepreneurship*, Volume 22, Issue 3.
- [22] Radović Marković, M. (2018). Organisational Resilience and Business Intinuity: Theoretical and Conceptual Framework, *Journal of Entrepreneurship and Business Resilience*, FIMEK, Novi Sad, pp. 5-11.
- [23] Williams, T. A., Gruber, D. A., Sutcliffe, K. M., Shepherd, D. A., & Zhao, E. Y. (2017). Organizational response to adversity: Fusing crisis management and resilience research. *Academy of Management Annals*, 11(2), 733–769.

- [24] Torani, S., Moradi Majd, P., Sedigh Maroufi, S., Dowlati, M., Sheikhi RA. (2019). The importance of education on disasters and emergencies: A review article. *J Educ Health Promot.* 2019 Apr 24; 8: 85. doi: 10.4103/jehp.jehp\_262\_18.
- [25] CHLOE (2023). The Power of IT Infrastructure Resilience: Ensuring Business Continuity. Available at: The Power of IT Infrastructure Resilience: Ensuring Business Continuity - Moments Log
- [26] Masten AS (2019). Resilience from a developmental systems perspective. *World Psychiatry.* 18(1): 101–102. doi: 10.1002/wps.20591
- [27] Radović Marković, M., Shoaib Farooq, M., Marković, D., (2017). Strengthening the resilience of small and medium-sized enterprises. *Y: TAKÁCS, István (ur.). Management, enterprise and benchmarking in the 21st century IV: "Global challenges, local answers"*. Budapest: Óbuda University, 2017, str. 345-356, graf. prikazi, tabele. <http://ebooks.iien.bg.ac.rs/1119/1/meb.pdf>.
- [28] Vogus, T. J., & Sutcliffe, K. M. (2007). Organizational resilience: Towards a theory and research agenda. In 2007 IEEE International Conference on Systems, Man and Cybernetics (pp. 3418–3422). IEEE.
- [29] Md. Shajahan, Kabir, Sahati, Wahid Zini, Radović-Marković, M., (2022). Women empowerment through agricultural technology : case study of Mymensingh-Bangladesh. *International review.*, no. 3/4, str. 57-66, tabele. ISSN 2217-9739. DOI: 10.5937/intrev2204059M. [COBISS.SR-ID 83800585].
- [30] Radulović D., Đukanović B., Vučeković M. (2022). Psychosocial adaptation to working from home, *International Review*, iss. 3-4, pp. 38-46.

**Article history:**

Received 3 October 2023

Accepted 14 December 2023

# DEVELOPING AN ANALYSIS MODEL FOR COMMUNICATING ETHICAL RESPONSIBILITY

TRIŠIĆ Marko<sup>1</sup>, DORDEVIĆ Bojan<sup>2</sup>, SKORUP Ana<sup>3</sup>, SKORUP Srđan<sup>4</sup>

<sup>1</sup>Business College of Applied Studies “Prof. Radomir Bojković, PhD”, Kruševac (SERBIA)

<sup>2</sup>Faculty of Management Zaječar, Megatrend University Belgrade (SERBIA)

<sup>3,4</sup>Business College of Applied Studies “Prof. Radomir Bojković, PhD”, Kruševac (SERBIA)

E-mail: trisic.marko@gmail.com; bojan.djordjevic@fmz.edu.rs; anaskorup@gmail.com; srdjan.skorup.ss@gmail.com

## ABSTRACT

*The two terms, analysis and self-analysis, are often treated as synonyms when used as research tools in corporate communications. That is particularly the case when it comes to business organizations without much prior knowledge and experience dealing with complex tasks that address contemporary issues. One of these tasks, which is becoming more popular, comes from the area of social responsibility. Many business organizations, especially the ones operating internationally, are working on improving their public standing precisely by using one or several of the four responsibility dimensions – economic, legal, ethical, and philanthropic. Ethical responsibility is one of the more popular dimensions, especially in Southeast Europe today. This responsibility dimension concentrates on implementing and improving inner standards, defined by the business organizations, that are determined to better the treatment of all stakeholders. But mere implementation and active usage aren't enough to convert the audience's opinion or significantly shift one's reputation. What is also needed is dynamic and cyclical communication that covers all the essential issues from the topic while including as many participants from the internal and external public as possible. That is the reason for a model that can analyze the communication of ethical responsibility, both inner and outer, but can also serve as a guiding tool for business organizations with low experience with social responsibility. What makes it especially essential is its implementation in countries in the process of legal EU integration and the lack of application of ethical principles in the workplace. Since the EU has the highest standards regarding ethical responsibility, this issue can be especially crucial for the country's economic and political future.*

**Keywords:** social responsibility, business ethics, corporate communication, analysis model

**JEL:** M14, M31, D83

**DOI:** 10.5937/intrev2304025T

**UDC:** 659.23

005.35:174

**COBISS.SR-ID** 133864969

## INTRODUCTION

The concept of socially responsible business is considered an umbrella term for mutually competitive, complementary, and overlapping meanings of concepts such as social performance and compassion of a business organization, ethical business practice, stakeholder management, sustainable business practice, and others (almost) synonymous concepts with socially responsible business [1]. One of the most popular approaches and definitions relies on the pyramidal model of social responsibility defined by the author Archie B. Carrol. According to the previously mentioned, social responsibility implies economic, legal, ethical, and philanthropic activities - the public's expectations of business organizations [2]. By this model, the economic approach represents the basis of the pyramid, following legal and ethical responsibility, with philanthropic responsibility at the top, which displays it as least relevant while simultaneously being the most visible, especially to the public. Although the pyramid concept can be considered universal, the ranking of the four factors that make up Carroll's pyramid has not proven to be exclusively universal. Although not drastically different, the scale and order are mainly related to the business culture, the strength and representation of bureaucracy, and the legal regulations of a particular system [3]. Out of the four responsibility types mentioned, this scientific paper focuses on ethical responsibility.

The third out of four places that ethical responsibility occupies somewhat describes its level of importance within business organizations and society. The position also indicates a set of duties that are not strictly prescribed through laws and regulations issued by the state but cannot be classified in the field of philanthropic (charitable) action either. Ethical responsibility is primarily related to internal rules prescribed by the business organization, but it may impact both the internal and external public and the environment. These internal rules are mainly defined by [3]: doing business in accordance with social customs and ethical norms, recognizing and respecting new moral standards, avoiding violations of ethical means to achieve business goals, behaving like responsible members of society that respect morals and ethics, and discerning that business integrity and ethics are broader concepts than compliance with laws and regulations.

Even though ethical responsibility is significantly related to the quality of work conditions and the general experience of employees, the desire to improve often comes from the external public instead of the internal one. That doesn't necessarily show a lack of interest amongst employees, especially management, to upgrade the ethical approach to doing business. That implies a significant communication disconnect between the quality and results of business self-evaluation compared to external (public) evaluators. Since communication determines the quality and quantity of available knowledge, it's also connected with almost every stakeholder impression and, therefore, the reputation a business organization acquires. In this case, an excellent public relations mechanism can play a vital role in employing every possible communication channel to send and possibly receive messages that can aid the business organization in its quest for self-preservation. The main benefits of using an excellent public relations (or P.R.) professional are [4]: improved business identity and purchase intent, more favorable business climate, enhanced reputation, less likely conflicts with stakeholders, reduced regulation and number of court cases, and increased employee satisfaction and productivity (with less turnover).

In the context of ethical responsibility, businesses use communication to voluntarily communicate with stakeholders about the business organization's contribution to solving ethical issues related to society and the natural environment [5]. Still, it can also provide information designed to contribute to realizing the goals of the ethically responsible business strategy, which always includes one-way or two-way communication with the public. However, certain elements, such as the state of ecological responsibility, cannot be determined without using official factors such as science and political activity that lean on various social factors and education [6]. Ecological responsibility must be studied carefully since it's one of the most significant parts of ethical responsibility. Still, it is also at constant odds with economic indicators since its goal is the highest possible income achieved and volume produced [7].

Regarding the Republic of Serbia, ethical or social responsibility, in general, was in recent history mainly based upon the Strategy for developing and promoting corporate social responsibility in the Republic of Serbia from 2010 to 2015. That was a document made in 2008 with the goals of promoting the concept of social responsibility, its development in practice, and applying incentives and legal principles to make the economic environment more favorable to the development of social responsibility [8]. The project created by the Ministry of Labor and Social Policy was short-lived, with negligible results. The first in a series of problems was the delay in the implementation of the strategy, which began

in 2011, while the lack of a final analysis after the (official) end of the project in 2015 remained the longest-lasting problem for the continuation of the development of social responsibility. Such results influenced the lack of interest in ethical responsibility and the general level of development of social responsibility in business organizations of the Republic of Serbia. On the other hand, positive examples can be taken from countries near Serbia, both geographically and economically, like the Republic of Croatia – which has achieved a higher status of achieving and measuring social responsibility using the Socially Responsible Behavior (SRB) index [9].

## METHODOLOGY

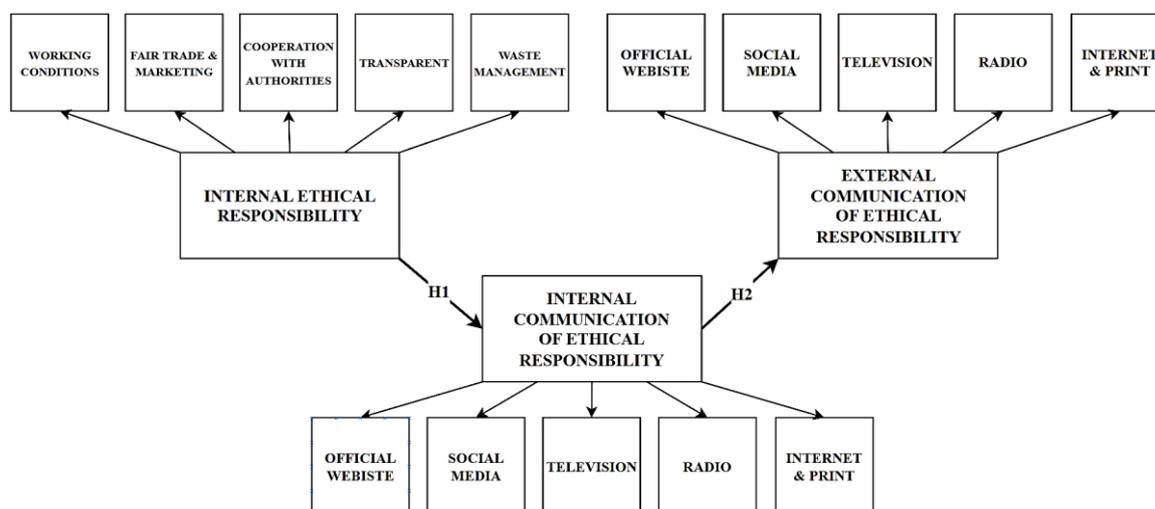
With a mission to develop a proper analysis model for communicating ethical responsibility, there must be a well-defined set of critical elements from which the model is constructed. These elements must also be interconnected not only for this research but also in everyday business operations. Knowing the previously mentioned and having the basic theoretical approach in mind, three key elements can be used to create and use such a model for analysis. These elements must be measurable for the internal process of practicing ethical responsibility, the internal approach to communicating ethical responsibility, and the external approach to communicating ethical responsibility.

Internal ethical responsibility must be measured by providing an opportunity for managers to assess the level of commitment achieved in the business organization they represent. Commitment to ethical responsibility is measured most efficiently while focusing on the quality of working conditions and environment for employees, fair trade and marketing policies implemented, cooperation with local authorities, progress in business transparency, and adequate waste management.

Internal communication of ethical responsibility also must be measured by assessing managers' opinions to evaluate the extent to which ethical responsibility actions are being communicated to the public by the business organization they represent. Internal communication assessment is measured best while focusing on various communication channels such as official business websites, social media, television, radio, and other internet and print media.

External communication of ethical responsibility is measured in the same fashion as internal communication, with the main difference being that the individuals providing their opinions and a general assessment are the members of the public. For this measurement to be most effective, it must focus on the same communication channels that the internal communication measurement focuses on.

With all three elements in mind, and the mission to develop an analysis model for communicating ethical responsibility, the main question that must be answered is: *Is the level of commitment in the implementation and communication of ethical responsibility, from the organizational point of view, directly related to the level of achieved visibility in the public?* Two hypotheses were defined to answer this question and determine the possible correlation and causation between the abovementioned elements. Both connections are presented in the measurement model (Fig. 1).



**Figure 1:** Measurement model for ethical responsibility communication

Source: Author

The first hypothesis (H1) is focused on the internal measurement of business organizations: With a higher internal review level of ethical responsibility, there is a higher internal review level of ethical responsibility communication.

The second hypothesis (H2) is on the nature of the relationship between the internal and external measurement of communication: With a higher internal review level of ethical responsibility communication, there is a higher external review level of ethical responsibility communication.

In order to test the hypothesis, answer the question, and possibly develop a satisfactory analysis model for communicating ethical responsibility, the research was conducted on 60 business organizations and 600 members of the public from the Republic of Serbia. Data gathering for the first and second element, and the whole first (and partially second) hypothesis, was conducted using an online questionnaire sent via email to business organization managers. For every business organization included in the research, there was a group of 10 members of the public per business organization that also received questionnaires via email. Their role was to give data covering the definition of the third main element and partially provide enough information to test the second hypothesis. The answers offered to business organizations participants regarding internal ethical responsibility were meant to measure their opinion using the Likert scale (from 1. "never" to 5. "very often"). The answers offered to both groups to measure internal and external communication of ethical responsibility were also meant to estimate the explicit opinions of the respondents. Still, in this case, that was done using binary answers (0 for "no" and 1 for "yes"). The data for both groups was collected successfully in the 2022-2023 period.

The Cronbach Alpha (CA) and the Kuder-Richardson (KR-20) tests were used to measure the internal consistency of the gathered data. Both tests were performed to determine whether all variables change "in the same direction" with a statistically significant level of correlation [10]. The rule accepted for this research was that values between 0.6 and 0.8 indicate a medium range of consistency, and above a value of 0.8 (up to 1.0) as a high range of consistency [11]. In addition to the two mentioned coefficients, the value of the mean correlation between items (Inter-Item Correlations) was also considered – between 0.15 to 0.49 for an average and between 0.5 and 0.85 for a high correlation [12].

Logistic regression was used to examine predicting categorical outcomes with two categories, thus assessing the accuracy of a set of predictor variables in predicting or explaining the dependent variable [13]. In this case, internal ethical responsibility is independent, and the internal communication of ethical responsibility is dependent as a variable. The method was used provided that the significance (*Sig.*) is less than 0.05.

The method that was used to investigate the relationship between two categorical variables by comparing the proportion or frequency of cases observed in each category was the Chi-Square (CS) distribution [10][13]. In this case, the variables of the internal communication of ethical responsibility were crossed with those of the external communication of ethical responsibility.

## RESULTS

The 60 business organizations included in the research consisted of 13 (21.7%) small, 23 medium (38.3%), and 24 (40.0%) large organizations. Most of them (34 or 56.7%) are from the manufacturing sector, a smaller amount (24 or 40.0%) from the service sector, and a minimal amount (2 or 3.3%) from the financial sector. A large majority of included business organizations are privately owned (47 or 78.3%), with only 7 (11.7%) mixed and 6 (10.0%) state-owned. Their primary target markets are domestic (for 39 or 65%), regional (for 11 or 18.3%), EU (for 5 or 8.3%), and global (for 5 or 8.3%). Most business organizations are market veterans, with 4 (6.9%) businesses active for 5 to 10 years and 54 (93.1%) active for over 10 years.

The questionnaires sent to business organizations had a 45% survey success rate. Of 60 participants, 38 (63.3%) identified as female and 22 (36.7%) as male. The age structure was quite diverse, with 15 (25.0%) from 18 to 25, 8 (13.3%) from 26 to 35, 8 (13.3%) from 36 to 45, 15 (25.0%) from 46 to 55, and 14 (23.3%) from 56 to 65. The highest achieved education level was also varied - 10 (16.7%) with high school education, 17 (28.3%) with 3-year higher education, 29 (48.3) with 4-year higher education, and 4 (6.7%) with a 5-year higher education degree. The questionnaires sent to public participants had a 32% survey success rate. Of 600 participants, 341 (56.8%) identified as female and 259 (43.2%) as male. The age structure was quite diverse, with 219 (36.5%) from 18 to 25, 109 (18.2%) from 26 to 35, 117 (19.5%) from 36 to 45, 74 (12.3%) from 46 to 55, 52 (8.7%) from 56 to 65, and 29 (4.8%)

participants being over 66. The highest achieved education level was also varied - 14 (2.3%) with primary education, 296 (49.3%) with high school education, 165 (27.5) with 3-year higher education, 92 (15.3%) with a 4-year higher education, 21 (3.5%) with a 5-year higher education, and 12 (2.0%) with an acquired PhD degree.

Regarding the responses about internal ethical responsibility from business representatives, Table 1 shows the percentages of individual responses to claims and the (total) mean value of the answers based on the Likert scale (from 1 to 5).

**Table 1.** Response representation for internal ethical responsibility

Claims	never	rarely	periodically	often	very often	Means
Achieves quality working conditions.	0.00%	0.00%	33.33%	31.67%	35.00%	4.02
Implements fair trade and marketing.	0.00%	0.00%	18.33%	51.67%	30.00%	4.12
Cooperates with local authorities.	1.67%	3.33%	18.33%	31.67%	45.00%	4.15
Makes progress in transparency.	0.00%	0.00%	38.33%	15.00%	46.67%	4.08
Executes adequate waste management.	1.67%	0.00%	18.33%	33.33%	46.67%	4.23
<b>Total:</b>	<b>0.67%</b>	<b>0.67%</b>	<b>25.33%</b>	<b>32.67%</b>	<b>40.67%</b>	<b>4.12</b>

Source: Author's analysis (SPSS)

Previous Table 1 presents that the most common responses to the claims were "often" and "very often", totaling 73.34%. Also, the proportion of mean values between the five claims is almost equally proportional. Regarding the responses from business representatives about internal communication of ethical responsibility, Table 2 shows the percentages of individual responses to claims and the number of respondents' answers by selecting "yes" or "no" (1 or 0).

**Table 2.** Response representation for internal communication of ethical responsibility

Claims	Participant response percentage		Participant response number	
	yes	no	yes	no
It uses its official website to emphasize ethical responsibility.	76.67%	23.33%	46	14
It uses social networks to emphasize ethical responsibility.	70.00%	30.00%	42	18
It uses a television program to emphasize ethical responsibility.	71.67%	28.33%	43	17
It uses a radio program to emphasize ethical responsibility.	71.67%	28.33%	43	17
It uses the Internet and print media to emphasize ethical responsibility.	68.33%	31.67%	41	19
<b>Total:</b>	<b>71.67%</b>	<b>28.33%</b>	<b>215</b>	<b>85</b>

Source: Author's analysis (SPSS)

Previous Table 2 presents the answer "yes" as the most common one, with a 71.67% share of 300 responses in total. Regarding the reaction from the public participants about the external communication of ethical responsibility, Table 3 shows the percentages of individual responses to claims and the number of respondents' answers by selecting "yes" or "no" (1 or 0). The claims used were the same as the ones used when measuring the results for internal communication of ethical responsibility.

**Table 3.** Response representation for external communication of ethical responsibility

Claims	Participant response percentage		Participant response number	
	yes	no	yes	no
It uses its official website to emphasize ethical responsibility.	90.50%	9.50%	543	57
It uses social networks to emphasize ethical responsibility.	88.33%	11.67%	530	70
It uses a television program to emphasize ethical responsibility.	89.50%	10.50%	537	63
It uses a radio program to emphasize ethical responsibility.	90.17%	9.83%	541	59
It uses the Internet and print media to emphasize ethical responsibility.	91.50%	8.50%	549	51
<b>Total:</b>	<b>90.00%</b>	<b>10.00%</b>	<b>2700</b>	<b>300</b>

Source: Author's analysis (SPSS)

Previous Table 3 presents the answer "yes" as the most common one, with a 90.00% share of 3000 responses in total. Regarding the internal consistency of the gathered data presented in Table 1, the Cronbach Alpha test was used to determine it, and the results show 0.84, which is satisfactory, especially considering that one group of claims (or scale) is composed of only 5 items. The inter-item correlation variance is 0.52, which constitutes a high correlation. When analyzing the results from Table 2 and Table 3, KR-20 was used to determine the internal consistency of the gathered data. The test has shown that the common internal consistency of 0.68 for internal communication and 0.70 for external communication results. The inter-item correlation variance is 0.30 for internal communication and 0.36 for external communication, constituting a medium correlation.

The ethical responsibility logistic regression results were calculated using the combined results for five claims presented in Table 1 and separate umbrella category from Table 2, and delivered through Cox & Snell R Square & Nagelkerke R Square pseudo-indicators, Hosmer & Lemeshow test significance, and the critical variables of the logistic regression test for ethical responsibility. The results previously mentioned are all presented in Table 4.

**Table 4.** Logistic regression

	<i>B</i>	<i>Exp (B)</i>	<i>Sig.</i>	<i>Cox &amp; Snell R<sup>2</sup></i>	<i>Nagelkerke R<sup>2</sup></i>	<i>Hosmer &amp; Lemeshow (Sig.)</i>
Internal ethical responsibility	2.169	8.753	.012	.133	.278	.052

Source: Authors analysis (SPSS)

The positive value of the regression coefficient *B* shows that an increase in the value of the independent variable causes an increase in the probability that the same respondent will answer positively in the dependent variable. The probability quotient for each independent variable *Exp(B)* represents the value of change in the probability between a positive and negative view and attitude towards the claims. In this case, the value is 2.169. With the predicted likelihood of membership being "yes", there is an increased probability of getting an affirmative answer about 9 times. It can also be observed that the *Sig.* value is lower than 0.05, which makes the result statistically significant. While interpreting the paired results for *Cox & Snell R<sup>2</sup>* & *Nagelkerke R<sup>2</sup>*, the results point out that the model explains between 13.3% and 27.8%. In the end, the significance factor of the *Hosmer & Lemeshow* test is higher than 0.05, making it statistically insignificant.

The Chi-Square test results were calculated using two umbrella categories, created from data presented in Table 2 and Table 3, and displayed in two separate tables. Table 5 represents the crosstabulation between two groups from business organizations and the public while showing counts, expected counts, and the percent of counts. Both groups provided "yes" and "no" answers.

**Table 5. Crosstabulation**

			External communication		Total
			no	yes	
Internal communication	no	Count	5	12	17
		Expected Count	1.7	15.3	17.0
		% of Total	8.3%	20.0%	28.3%
	yes	Count	1	42	43
		Expected Count	1	42	43
		% of Total	4.3	38.7	43.0
Total	Count	6	54	60	
	Expected Count	6.0	54.0	60.0	
	% of Total	10.0%	90.0%	100.0%	

Source: Authors analysis (SPSS)

Table 5 shows that the group with a negative opinion about ethical responsibility communication from the position of a business organization has a more positive attitude towards ethical responsibility communication from the role of the public - in a ratio of 12 to 5. On the other hand, the group with a positive opinion about ethical responsibility communication from the position of a business organization has a more positive than negative attitude towards ethical responsibility communication from the role of the public - in a ratio of 42 to 1.

Table 6 represents the gathered results for the chi-square value, degrees of freedom, significance, and the effect size measurement (Cramer's *V*). Since each variable has two categories ("yes" or "no"), Yates' Correction for Continuity is used in the interpretation of the results.

**Table 6. Chi-Square tests and Symmetric measures**

	$X^2$	<i>df</i>	<i>p</i>	Cramer's <i>V</i>
Ethical responsibility communication	7.150	1	.007	0.24

Source: Authors analysis (SPSS)

With the  $X^2$  value of 7.15 and 1 degree of freedom (*df*), there is a low value of significance (*p*), which is 0.007 and is lower than 0.05 (and 0.01). The strength of the connection between the variables can also be determined using Cramer's *V* coefficient. The coefficient is between 0.1 and 0.3, so the 0.24 value represents a small impact

## DISCUSSION AND CONCLUSION

The complete logistic regression results proved that the whole model between internal ethical responsibility and its communication is valid. The conclusion that the internal perception of ethical responsibility serves as a good predictor of communication of ethical responsibility from the position of a business organization is evident based on three key factors:

- The positive value of the regression coefficient (*B*) means that the business representatives with a higher opinion of internal ethical responsibility react more affirmatively to claims about communication of ethical responsibility.
- The high values of the odds ratios ( $Exp(B)$ ), wherewith more positive levels of internal ethical responsibility perception, comes to an increased probability of a positive response to claims about communication of ethical responsibility.
- The fact that the results are all statistically significant.

The previous results confirm the first hypothesis (*H1*), which claims that with a higher internal review level of ethical responsibility, there is a higher internal review level of ethical responsibility communication.

A strong relationship between the variables from the internal and external communication of ethical responsibility is evident based on the chi-square results for the communication of ethical responsibility. The variables all have a medium-strength connection based on *Cramer's V* results. Conclusions are also statistically significant with above 95% certainty. Considering the previously mentioned results, they confirm the second hypothesis (*H2*), which claims that with a higher internal review level of ethical responsibility communication, there is a higher external review level of ethical responsibility communication.

With two hypotheses confirmed, the proposed ethical responsibility communication analysis model seems plausible – both in theory and for practical use. Confirming hypotheses also brings back the issue of returning to the main question, which now carries an entirely positive answer. In conclusion, the level of commitment to implementing and communicating ethical responsibility from the organizational point of view is directly related to the level of achieved visibility in the public.

The model was constructed to provide "a look in the mirror" for business organizations instead of exclusively relying on their experience and intuitive thinking. Even though the model is a one-way one, the author's intention for a finalized model is everything but. Establishing a two-way communication system is crucial where both sides, the business organization, and the public, can mutually benefit one another. The goal is to establish a cyclical system that would aid business organizations in their quest for self-analysis. That is important for every business organization since their need to strengthen the public image and reputation is common. That is why the science paper highlighted the importance of strategically communicating by choosing suitable media for the right message and crowd.

The paper was done while exclusively focusing on participants from the Republic of Serbia. On the one hand, that is commendable since very little research is devoted to similar subjects in the mentioned geographical area. On the other hand, it would've been even better if the focus was broader. Doing similar research on a larger scale for a group of countries from Southeast Europe would've been a more significant challenge with a greater reward – a model that could possibly apply to several countries. That would be useful because it would show how the methodology and hypotheses hold in different environments and cultures. It would also be a decent idea for future research to focus more on the consequences caused by more specific events like COVID-19 or the war in Ukraine instead of only concentrating on common well-rounded issues.

## REFERENCES

- [1] Mahmood, M., Humphrey, J. (2012). Stakeholder Expectation of Corporate Social Responsibility Practices: A Study on Local and Multinational Corporations in Kazakhstan. *Corporate Social Responsibility and Environmental Management*, 20(3), pp. 168-181.
- [2] Carroll, A.B. (2016). Carroll's pyramid of CSR: taking another look. *International Journal of Corporate Social Responsibility*, 3(1), pp. 1-8.
- [3] Noamene, T., Elouadi, S. (2015). The Pyramid of Corporate Social Responsibility (CSR): An Empirical Examination in the Tunisian Context. *International Business Research*, 8(10), pp. 117-125.
- [4] Benn, S., Lindi R.T., Pendleton, J. (2010). Public Relations Leadership in Corporate Social Responsibility. *Journal of Business Ethics*, 96, pp. 403-423
- [5] Fryzel, B. (2015). *The True Value of CSR - Corporate Identity and Stakeholder Perceptions*. Palgrave Macmillan, London.
- [6] Vujičić, S., Cogoljević, M., Nikitović, Z. (2022) The Development of Ecological Awareness in the Republic of Serbia. *International Review Belgrade*, 1(2), pp. 51-59.
- [7] Đukić, G., Ilić, B. (2020) Sustainability in Higher Education – Comparison of the Asia-Pacific Region and Serbia. *Trendovi u Poslovanju*, 8(1), pp. 9-21.
- [8] Ministry of Labor and Social Policy (2008). *Strategy for developing and promoting corporate social responsibility in the Republic of Serbia from 2010 to 2015*. Belgrade, Serbia.
- [9] Mrvica Mađarac, S., Nedović, M., Galić, M. (2021) Socially Responsible Business in Relation to Suppliers, *International Review Belgrade*, 3(4), pp. 56-61.
- [10] Lavrakas, P.J. (2008). *Encyclopedia of survey research methods*. SAGE Publications Incorporated, California, USA.
- [11] Ursachi, G., Horodnic A. I., Zait, A. (2015). How reliable are measurement scales? External factors with indirect influence of reliability estimators. *Procedia Economics and Finance*, 20(3), pp. 679-686.
- [12] Paulsen, J., BrckaLorenz, A. (2017) *Internal Consistency Reliability, Faculty Survey of Student Management*, Indiana University, Bloomington, USA.
- [13] Pallant, J. (2017). *SPSS: priručnik za preživljavanje*. Mikro knjiga, Beograd, Srbija.

### Article history:

Received 28 August 2023

Accepted 27 November 2023



\

**PART II**  
**CAREER DEVELOPMENT, EDUCATION AND**  
**EMPLOYMENT**



# ANALYSIS OF INNOVATION AND CREATIVITY IMPACT ON THE ENTREPRENEUR CAREER DEVELOPMENT

JANOŠIK Marija<sup>1</sup>, MOMČILOVIĆ Oliver<sup>2</sup>, VUJIČIĆ Slađana<sup>3</sup>

<sup>1</sup>University Business Academy in Novi Sad, Faculty of Applied Management, Economics and Finance, Belgrade (SERBIA)

<sup>2</sup>University Business Academy in Novi Sad, Faculty of Applied Management, Economics and Finance, Belgrade (SERBIA)

<sup>3</sup>Faculty of Business, Economics and Entrepreneurship, Belgrade (SERBIA)

E-mails: marija.janosik@mef.edu.rs; oliver.momcilovic@mef.edu.rs; sladjana.vujicic@vspep.edu.rs;

## ABSTRACT

*In contemporary literature, entrepreneurship is increasingly attracting attention by emphasizing new observation angles of innovation and creativity. Creativity is exactly the initial impulse that can encourage entrepreneurs to realize an entrepreneurial venture. Finding niches in the market, noticing needs that others have not, as well as different activities, circumstances or events characterize the uniqueness that represents creativity. Entrepreneurial activity generates sustainable economic growth and a better standard of living through innovation and comparative advantage. The innovativeness of an entrepreneur is reflected through a new focus of seeing things, that is, the courage to try something new and different from the existing one. It is precisely in this segment that we can talk about the career of an entrepreneur, which includes a tendency to take risks, enthusiasm for adopting new ideas, accepting new business methods, and, finally, implementing innovative strategies in the business he is engaged in. In the empirical research that was conducted for this work on 168 entrepreneurs, all from the territory of the Republic of Serbia, the connection between innovation, creativity, and career was analyzed.*

**Keywords:** entrepreneurship, innovation, creativity, career development.

**JEL:** L26, M10

**DOI:** 10.5937/intrev2304037J

**UDC:** 005.966

005.591.6

005.336:005-051

**COBISS.SR-ID** 133866505

## INTRODUCTION

It is believed that the concept of entrepreneurship, as well as management, is as old as human civilization. The etymological root of the term entrepreneurship comes from the French word *entrepreneur*, which means to pass between.

It can be said that entrepreneurship represents: an adequate choice of the company's production function, innovative activity, traditional management, and the quality of a person who invests [1].

Various authors have given definitions of the role of an entrepreneur:

- a person who carries uncertainty [2];
- innovator [3];
- decision maker [4];
- industry leader [3];
- organizer and coordinator of economic resources [5];
- the arbiter, the one who warns of possibilities [6];
- resource allocator among possible alternatives [7].

A person who organizes a business to appropriate profit, but also bears the risk of that business, who constantly innovates, creates opportunities, avoids risks, perceives threats, and looks for new opportunities is called an entrepreneur, and the process that takes place on that occasion is called entrepreneurship.

Nowadays, both male and female entrepreneurs represent a very important figure in our society, and the primary goal of the world economy is becoming entrepreneurship due to its extremely favorable impact on well-being and employment [8].

As we can conclude from contemporary literature entrepreneurship can generate economic growth and improvement of living standards, especially when it comes to innovation and competitiveness. Furthermore, these activities help overcome economic inequality and promote social equality and justice [9].

On the other hand, an increasing number of female entrepreneurs are significantly showing interest in entrepreneurship, which results in starting new business ventures. Women are trying to become the originators of new trends, by distancing themselves from the traditional role of women and investing in new business ventures [10]. Although there is a large increase in the percentage of women who establish businesses that will bring a contribution to the economy of the country in which they operate, the support of society and the state in most cases is absent.

The main characteristics of developing the career of an entrepreneur, of any gender, are exactly two key characteristics of entrepreneurship, namely: innovation and creativity.

## INNOVATIVENESS IN ENTREPRENEURSHIP AND THE KEY CHARACTERISTIC OF AN ENTREPRENEUR

The creation of more effective and efficient processes, products, and ideas is primarily influenced by innovations. A significant competitive advantage can be achieved through the application of innovation and thus represents a key factor in entrepreneurship. First, it is necessary to make a distinction between the concepts of entrepreneurship and innovation. Innovation introduces a new idea, product, or service, unlike entrepreneurship, which represents a great idea for a business venture. These two terms are inextricably linked because entrepreneurship begins with innovation [11].

An idea does not automatically mean that the innovation is accepted by the market and commercialized. For the commercialization of an innovation, it is necessary to fulfill many prerequisites, such as initial financial resources, a gathered team of people, and a well-created business model [12]. Due to the great technological development of the market, innovative ideas are very rare and most often represent significant strategic opportunities that can lead to the creation of a large income if they prove successful.

There are two types of innovation [12]:

- Technological innovations that are oriented towards research and development of new products and processes as well as process reengineering.
- Product-market innovations have a focus on product design, market research, advertising, and promotion.

Four prominent and different dimensions of innovation types are [13]:

- product innovation versus process innovation;
- radical versus incremental innovation;
- architecture innovation versus component innovation;
- competence-enhancing innovations versus competence-destroying innovations.

Innovation must be part of the business strategy of every entrepreneur because, in today's changing environment, innovation is crucial for the survival of companies. "The innovativeness of an entrepreneur depends on his or her willingness to do things differently, ie. to try new ways that are different from the current ones, from his or her enthusiasm to adopt new ideas and new methods in their business, as well as from the desire to implement innovative strategies in their business." [12]

All innovation begins with creative ideas. Creativity is the starting point for innovation. Creativity is however necessary but not a sufficient condition for innovation. Innovation is the implantation of creative inspiration [14].

## **CREATIVITY IN ENTREPRENEURSHIP: PROCESSES AND PEOPLE**

With the development of entrepreneurship, a large number of researchers associate creativity with entrepreneurship, because creativity is a key factor in the development of the entrepreneurial activity, and entrepreneurship itself is considered a creative activity [15].

Many researchers have explored creativity in the field of entrepreneurship, but there is as yet no standardized definition for creativity [16]. Thus, creativity is the ability to develop new ideas and discover new ways of looking at problems and opportunities. Innovation is the ability to apply creative solutions to those problems and opportunities to improve or enrich people's quality of life" [17].

In entrepreneurship, at the individual level, creativity refers to the process in which entrepreneurs combine resources that already exist and generate new ideas to start an innovative business [18]. Creativity is one of the main characteristics of an entrepreneur, which implies the tendency to find and develop new ideas as well as new approaches to analyzing and solving opportunities and problems.

Creative ideas can be of varying degree of use and economic value, while others can be very simple, but give the impression that he still hasn't remembered to implement them [14]. Creativity most often occurs when an individual wants to stand out from the crowd by doing something unique.

The categorization of the hierarchy of creativity was defined by Taylor [19]:

- Expressive Creativity – free, unlimited, often primitive ideas, without any sort of restrictions.
- Technical Creativity - ideas limited by laws or physics with no or very few spontaneous thoughts.
- Inventive Creativity - ideas made as a combination of existing.
- Innovative Creativity - ideas evolve from existing ideas improved, by thinking "out of the box".
- Emergency Creativity - free unarresting level of thinking, where ideas are not abiding by the laws of the physical world.

Two factors of creativity are important, namely, processes and people, whereby the process is more goal-oriented, that is, it is designed to operationally solve the problem, while people are a resource that determines the solution itself. While the process remains the same, people change the problem with their approach [20]. People with a high level of creativity have greater self-confidence and a positive attitude in the entrepreneurial process. Creativity is extremely important for those people who decide to become entrepreneurs. Entrepreneurial intention is conditioned by creativity, which represents one of the fundamental entrepreneurial characteristics.

## **ENTREPRENEURIAL CAREER DEVELOPMENT: INNOVATIVE AND CREATIVE LEVEL**

The term career can be defined as a life path. A more complex definition of a career implies the development of an individual in learning and working throughout life. The main goal of career development is to meet the current and future needs of both the organization and the individual at work, which leads to greater opportunities for employment, or more precisely, developing the ability to be employed. A career is represented by a series of activities and positions that an individual adopts during



## METHODOLOGICAL SETTINGS OF THE RESEARCH

Based on the set theoretical research model, the following tasks were defined, namely, to determine whether the Creativity level (further in the text CRL), does not affect or affect the Career level (further in the text CAL) and whether the Level of innovation (further in the text LIN), does not affect or affect the Career level. The final task of the research is to determine whether Creativity level & Level of innovation, do not influence or influence Career level.

Based on the set theoretical research model and defined research tasks, the research hypotheses of the research were formed- Table 1., which read:

*Table 1. Research hypotheses*

H <sub>01</sub> : Creativity level, does not affect Career Level	H <sub>alt1</sub> : Creativity Level, affects Career Level
H <sub>02</sub> : Level of innovation, does not affect Career Level	H <sub>alt2</sub> : Level of innovation, affects Career Level
H <sub>0</sub> : Creativity level & Level of innovation, do not affect Career Level	H <sub>alt</sub> : Creativity level & Level of innovation, influence Career Level

*Source: Author's research*

The projected sample of entrepreneurs was 250, however, the actual sample that was processed was 168 entrepreneurs, all from the territory of the Republic of Serbia. Based on the theoretical research model, defined tasks, and set research hypotheses, a Questionnaire for Entrepreneurship was created (Appendix 1). The questionnaire consisted of two parts. In the first part of the Questionnaire, they provided information about the profile of their companies. In the second part of the Questionnaire, they expressed their personal opinions on the defined positions and claims, which were related to Creativity level, Level of innovation, and Career level. Attitudes are defined by a 5-point Likert scale.

## THE EMPIRICAL PART OF THE RESEARCH

Based on Appendix 1. and table a. in Table 1., the frequencies and percentage representation of profiles of companies and entrepreneurs are given.

*Table 1. Frequencies percentage representation for the respondent's profile*

Company activity	N	Total	% of Total
Services	89	168	52.98
Production & Services	49		29.17
Production	30		17.86
Position in the company	N		% of Total
owner - entrepreneur	84		50.00
manager	84		50.00
Realized income of the company in 2021	N		% of Total
less than €50,000	40		23.81
from 50,001 to 100,000€	52		30.95
from 100,001 to 500,000€	36		21.43
over €500,001	40		23.81
Market	N		% of Total
domestic market	133		79.17
foreign market	35		20.83

*Source: Author's calculations based on the questionnaire survey*

The most were for Company activity Services 89 or 52.98%, and the least for Production 30 or 17.86% of a total of 168 companies. For Positions in the company, the number of owners - entrepreneurs, and managers is equal, 84 each or 50% of the total of 168 respondents. By Realized income of the company in 2021 the most were from €50,001 to €100,000 52 or 30.95%, and the least was from

€100,001 to €500,000 36 or 21.43% of the total of 168 companies. For Market, the domestic market was more than 133 or 79.17%, and the foreign market was than less 35 or 20.83% of a total of 168 companies.

Correlation and regression analysis for the variable (CRL-CAL) - on Fig. 3. the basic standard evaluation of the derived theoretical system model was performed. The coefficient of determination is 0.621393, which means that with 62.13% of the dependent variable (CAL) can be explained by the independent variable (CRL). Based on this, we can conclude that the correlation coefficient between the independent variable (CRL) and the dependent variable (CAL) is 0.788285 and that there is a strong correlation – the connection between them. The statistical significance of the ANOVA test is [F(1,166)=272.4493, p<0.0001]

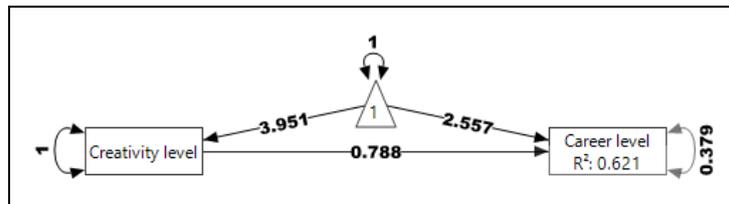


Fig. 2. Standard contribution sizes of the derived theoretical system model (CRL-CAL)  
Source: Author's research

Based on these data, the null hypothesis  $H_{01}$  cannot be accepted, but the alternative hypothesis  $H_{alt1}$  is accepted: Creativity level affects career level. It can be concluded that the greater the influence of the Level of innovation, the greater the Career level is.

In Fig. 3. non-standard contribution sizes are given for the set Derived theoretical system model. The mean score for the independent variable (CRL) is 3.8869048. The magnitude of the variance for the independent variable (CRL) is 0.968, and the variance for the dependent variable (CAL) is 0.183.

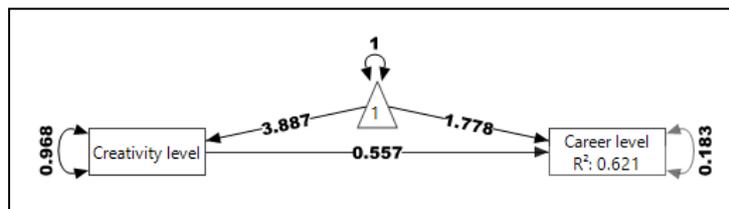


Fig. 3. Non-standard contribution sizes of the derived theoretical system model (CRL-CAL)  
Source: Author's research

Based on the data shown, a regression equation (formula 1) can be formed, which reads:

$$\text{Career level} = 1.7784286 + 0.5572598 \cdot \text{Creativity level} \quad (1)$$

On Fig. 4. is given the diagram of the regression equation for the variables (CRL-CAL).

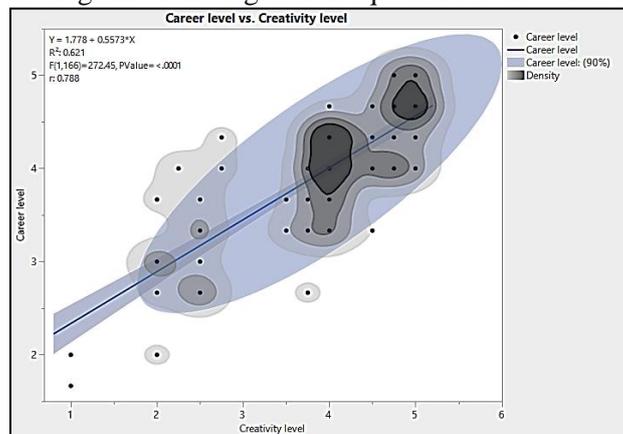
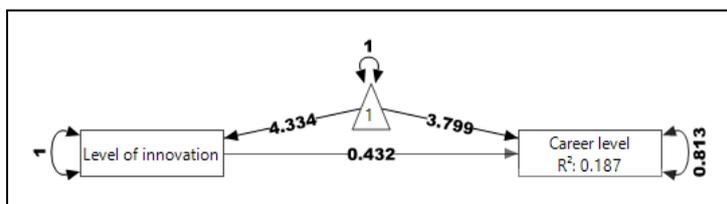


Fig. 4. Diagram of the regression equation for variables (CRL-CAL)  
Source: Author's research

Correlation and regression analysis for the variable (LIN-CAL) - on Fig. 5. the basic standard evaluation of the Derived theoretical system model was performed. The coefficient of determination is 0.186653, which means that with 18.66% the dependent variable (CAL) can be explained by the independent variable (LIN). Based on this, we can conclude that the correlation coefficient between the independent variable (LIN) and the dependent variable (CAL) is 0.432033 and that there is a relatively weak correlation – the connection between them. The statistical significance of the ANOVA test is [F(1,166)=38.0948, p<0.0001]

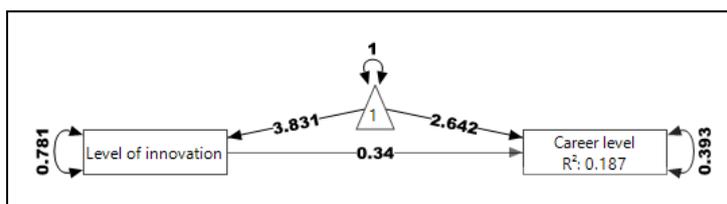


**Fig. 5. Standard contribution sizes of the derived theoretical system model (LIN-CAL)**  
 Source: Author’s research

Based on these data, the null hypothesis H<sub>02</sub> cannot be accepted, but the alternative hypothesis H<sub>alt2</sub> is accepted: *Level of innovation*, affects *career level*. It can be concluded that the greater the influence of the *Creativity level*, the greater the *Career level* is.

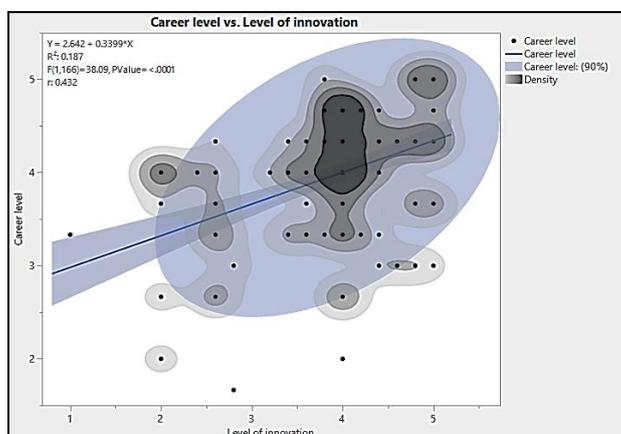
In Fig. 6. non-standard contribution sizes are given for the set Derived theoretical system model. The mean score for the independent variable (LIN) is 3.83309524. The magnitude of the variance for the independent variable (LIN) is 0.781, and the variance for the dependent variable (CAL) is 0.393. Based on the data presented, a regression equation (formula 2) can be formed, which reads:

$$Career\ level = 2.6422899 + 0.3399036 \cdot Level\ of\ innovation \quad (2)$$



**Fig. 6. Non-standard contribution sizes of the derived theoretical system model (LIN-CAL)**  
 Source: Author’s research

On Fig. 7. is given the diagram of the regression equation for the variables (LIN-CAL).



**Fig. 7. Diagram of the regression equation for the variable (LIN-CAL)**  
 Source: Author’s research

Multiple correlations and regression analysis for variables (CRL&LIN-CAL) - is based on the Theoretical System Model (Fig. 1.). The system model consists of the following independent variables: (CRL) and (LIN) and the dependent variable (CAL). In Fig. 8. the basic standard evaluation of the system model was performed. The coefficient of multiple determination is 0.80717, which means that with 80.71% of the variability, the dependent variable (CAL) can be explained by the other independent variables. The multiple correlation coefficient is 0.898426. The correlation between the variables is positive and strong. We can see from the magnitude of the correlation coefficients that the largest correlation is between the independent variable (CRL) and the dependent variable (CAL) and is 0.7883, and the smallest correlation is between the independent variables (CRL) and (LIN) and it is insignificant and is 0.4320. The independent variable (CRL) has a greater influence on the dependent variable (CAL) and is 0.78773, and the independent variable (LIN) has a smaller influence on it is 0.431019. The ANOVA test results in statistical significance [F(2,165)= 345.3381, p<0.0001].

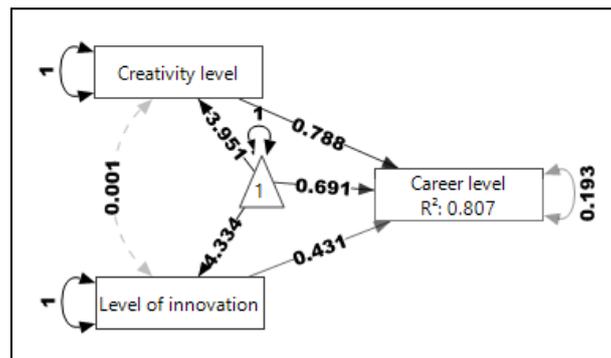


Fig. 8. Standard contribution sizes of the system model for (CRL&LIN-CAL)

Source: Author's research

Based on these data, the null hypothesis  $H_0$  cannot be accepted, but  $H_{alt}$  is accepted: *Creativity level & Level of innovation, influence the Career level.* It can be concluded that the greater the influence of *Creativity level & Level of innovation*, the greater the *Career level* is.

Non-standard contribution sizes for the set system model are given in Fig. 8. The highest mean score is for the independent variable (CRL) and is 3.8869047, and the lowest for the independent variable (LIN) is 3.8309524. The largest size for the variance is the size of the independent variable (CRL) 0.968, and the smallest variance is for the dependent variable (CAL) which is 0.093. The covariance between the independent variables (CRL) and (LIN) is 0.001. Based on the data from (Fig. 9.), a multiple regression equation (formula 3) can be formed, which reads:

$$\text{Career level} = 0.4808554 + 0.5568676 \cdot \text{Creativity level} + 0.3391057 \cdot \text{Level of innovation} \quad (3)$$

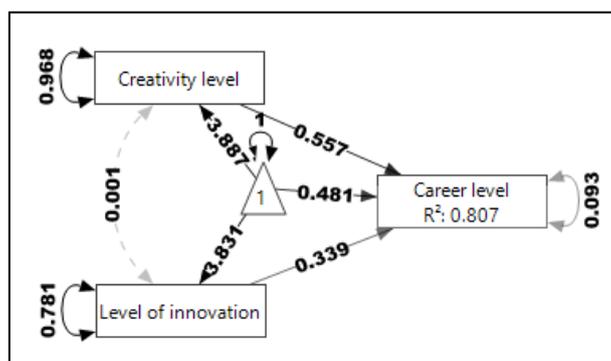
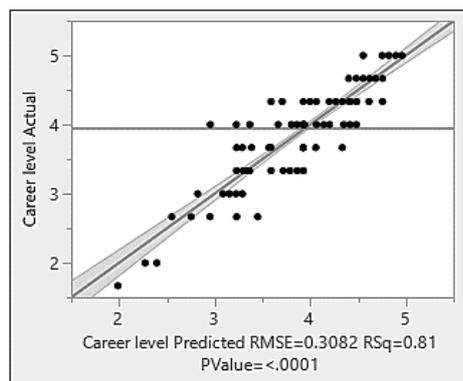


Fig. 9. Non-standard contribution sizes of the system model for (CRL&LIN-CAL)

Source: Author's research

In Fig. 10. is shown the diagram of the multiple regression equation for the variables (CRL&LIN-CAL).



*Fig. 10. Diagram of multiple regression equation for variables (CRL&LIN-CAL)*

*Source: Author's research*

## CONCLUSION

In a turbulent environment, where there is an increasing number of competitors, the entrepreneur is expected to provide the market with new and superior products, then innovation and creativity represent a strategic advantage.

Entrepreneurship encourages creativity and innovation. Innovation and creativity are the core of entrepreneurship, which means they play a key role in creating a successful and sustainable business. Creativity has always been closely related to innovation, while innovation is known as finding a creative solution to a problem.

Entrepreneurs must ensure that the organization continues to impress the customer and produce a product in line with the requirements that are the goal of any business. Innovative elements must be constantly developed to cover the company's own needs for survival. Entrepreneurs who incorporate creativity and innovation into their business models will thrive and be more successful than entrepreneurs who stick to the traditional sales-only business model. The value of creativity and innovation that creates new business ideas attracts more benefits and added value for businesses. Creativity and innovation are no longer a concern for maintaining the company and maintaining competitiveness.

Through innovation and creativity, an entrepreneur provides the opportunity to create a completely new idea or to do existing things innovatively. Applying creativity to find a solution to a problem is known as innovation.

From the attached research, and based on the set Theoretical System Model and applied methodology, it can be concluded that the greater the influence of Level of the innovation, the greater Career level is, which coincides with previous research by the authors Gupta et al., [25], that the efforts of entrepreneurs and managers should be directed to develop innovations and an organizational culture that encourages the company's performance, and the authors Naranjo-Valencia et al., agree with this. [26]. The following conclusion indicates that the greater the influence of Creativity level, the greater Career level is, and it coincides with the research of authors Weixiao et al., [27] that the variability of business tasks and employees are important contextual factors that moderate the effect of the diversity of the educational level of employees, which affects their creativity and career. The key conclusion of the research is that the greater the influence of Creativity level & Level of innovation, the greater Career level is, which also confirms the opinion of the author Keqiucheng [28] that goal orientation significantly moderates the relationship between creative personality traits and employee's innovative performance.

**REFERENCES**

- [1] Vukotić, S. & Brzaković, P. (2020). *Preduzetnički menadžment - kroz pitanja i odgovore*, Fakultet za primenjeni menadžment, ekonomiju i finansije, Beograd.
- [2] Knight, F. (1921). *Risk, Uncertainty, and Profit*. Boston: Houghton Mifflin Co.
- [3] Schumpeter, J. (1934). *The Theory of Economic Development*, Cambridge Mass: Harvard. University Press
- [4] Casson, M. (2003). *The Entrepreneur. An Economic Theory*. 2nd edition. Cheltenham: Edward Elgar.
- [5] Marshall, A. (1890). *Principles of Economics*. London: The Mac Millan Press
- [6] Kirzner, I.M. (1997). Entrepreneurial Discovery and the Competitive Market Process: An Austrian Approach. *Journal of Economic Literature*, 35(1), 60 – 85.
- [7] Schultz, T. (1975). The value of the ability to deal with disequilibria. *Journal of Economic Literature*, 13(3), 827-846.
- [8] Martínez-Rodríguez, I., Quintana-Rojo, C., Gento, P. & Callejas-Albinana, F.E. (2022). Public policy recommendations for promoting female entrepreneurship in Europe. *International Entrepreneurship and Management Journal*, 18(3), pp.1235-1262.
- [9] Stoica, O., Roman, A. & Rusu, V.D. (2020). The nexus between entrepreneurship and economic growth: A comparative analysis on groups of countries. *Sustainability*, 12(3), 1186.
- [10] Lai, K.P., Nathan, R. J., Tan, K.S. & Chan, B.B. (2010). Effect of innovation to the success of female entrepreneurs. *Journal of Innovation Management in Small and Medium Enterprise*, 2010, pp. 1-14.
- [11] Čičovački, T., Kulić, M. & Škorić, S. (2022). Inovacije i preduzetništvo. 28. Skup Trendovi razvoja: Univerzitetsko obrazovanje za privredu, Kopaonik, pp. 398 - 400.
- [12] Petković, S. (2021). *Preduzetništvo i inovacije u digitalnoj eri* Preduzetništvo, digitalizacija i inovacije, 347, Univerzitet u Banja Luci, Ekonomski fakultet
- [13] Datta, A., Reed, R. & Jessup. L. (2013). Commercialization of innovations: an overarching framework and research agenda. *American Journal of Business*, 28(2), 147 – 191. (str.162)
- [14] Okpara, F.O. (2007). The value of creativity and innovation in entrepreneurship. *Journal of Asia entrepreneurship and sustainability*, 3(2), p.1.
- [15] Shi, Y., Yuan, T., Bell, R. & Wang, J. (2020). Investigating the Relationship Between Creativity and Entrepreneurial Intention: The Moderating Role of Creativity in the Theory of Planned Behavior. *Front. Psychol.* 11:1209. doi: 10.3389/fpsyg.2020.01209
- [16] Kusmintarti, A., Asdani, A. & Riawanti, N.I. (2017). The relationship between creativity, entrepreneurial attitude and entrepreneurial intention (case study on the students of State Polytechnic Malang). *International Journal of Trade and Global Markets*, 10(1), pp.28-36.
- [17] Scarborough, N.M. & Cornwall, J.R. (2016). *Essentials of Entrepreneurship and Small Business Management*, 8th Edition. Essex, England: Pearson. pp. 97
- [18] Chua, H.S. & Bedford, O. (2016). A qualitative exploration of fear of failure and entrepreneurial intent in Singapore. *J. Career Dev.* 43, 319–334. doi: 10.1177/ 0894845315599255
- [19] Taylor, I.A. (1975). An emerging view of creative actions, in I. A. Taylor, and J. W. Getzels (eds.) *Perspectives in Creativity*, Aldine, Chicago.
- [20] Škrtić, M. & Mikić, M. (2011). *Poduzetništvo*. Zagreb: Sinergija str. 113-114.
- [21] Mirčetić, V., Vukotić, S. & Karabašević, D. (2022). Savremeni pristup portfoliju karijere u upravljanju projektima: Elektronski portfolio karijere, XXIV međunarodni kongres iz upravljanja projektima zbornik radova “Hibridni projektni menadžment – imperativ budućnosti” udruženje za upravljanje projektima Srbije, 07.-09. maja 2022. godine pp. 224-229.
- [22] Greenhause, J.H. & Callanan, G.A. (1994). *Career Management*, London: Dryden Press.
- [23] Korotov, K., Khapova, S. & Arthur, M. (2010). Career entrepreneurship. Published in *Organizational Dynamics*, 40(2), pp.127-135.
- [24] Mazla, M.I.S.B., Jabor, M.K.B., Tufail, K., Yakim, A.F.N. & Zainal, H. (2020). The Roles of Creativity and Innovation in Entrepreneurship. In *International Conference on Student and Disable Student Development 2019 (ICoSD 2019)* (pp. 213-217). Atlantis Press.
- [25] Gupta, A.K., Tesluk, P.E. & Taylor, M.S. (2007). Innovation at and across Multiple Levels of Analysis. *Organization Science*, 18(6), 885–897. <http://www.jstor.org/stable/25146148>
- [26] Naranjo-Valencia, C. J., Jiménez-Jiménez, D. & Sanz-Valle, R. (2016). Studying the links between organizational culture, innovation, and performance in Spanish companies. *Rev Lat Psic.* 48:30-41
- [27] Weixiao, G., Chenjing, G. & Duanxu, W. (2021). When Does Educational Level Diversity Foster Team Creativity? Exploring the Moderating Roles of Task and Personnel Variability, *Frontiers in Psychology*, <https://doi.org/10.3389/fpsyg.2021.585849>
- [28] Keqiucheng, Z. (2021). The Influence of Creative Personality and Goal Orientation on Innovation Performance. *Frontiers in Psychology*, <https://doi.org/10.3389/fpsyg.2021.634951>

**APPENDIX**

*Table a. Profile of respondents from the Questionnaire*

Company activity	Services	
	Production & Services	
	Production	
Position in the company	owner - entrepreneur	
	manager	
Realized income of the company in 2021	less than €50,000	
	from 50,001 to 100,000€	
	from 100,001 to 500,000€	
	over €500,001	
Market	domestic market	
	foreign market	

Source: Author's research

*Table b. Claims and attitudes of respondents from the Questionnaire*

Claims		Attitudes				
		I totally disagree	Partially disagree	I neither agree nor disagree	Partially agree	I totally agree
		1	2	3	4	5
CRL Creativity level	CRL <sub>1</sub> – I consider myself creative					
	CRL <sub>2</sub> – They encourage the creativity of employees in the company					
	CRL <sub>3</sub> – I believe that the creative product/service affects the consumer/service user					
LIN Level of innovation	LIN <sub>1</sub> – I consider myself innovative					
	LIN <sub>2</sub> – In the company, they encourage the innovation of employees					
	LIN <sub>3</sub> – I believe that an innovative product/service affects the consumer/service user					
CAL Career level	CAL <sub>1</sub> – In the company, they encourage the career development of employed employees					
	CAL <sub>2</sub> – The most important factor of entrepreneurial success is the entrepreneurial career					
	CAL <sub>3</sub> – Expressed creativity and innovation are very important for the development of my career					

Source: Author's research

**Article history:**

Received 1 November 2022

Accepted 10 December 2022



# CRITICAL ANALYSIS OF THE MANNERS OF ESTABLISHMENT AND EXTENSION OF EMPLOYMENT RELATIONSHIPS OF EMPLOYEES IN HIGHER EDUCATION OF THE REPUBLIC OF SERBIA

DABIĆ Sandra<sup>1</sup>, URDAREVIĆ Bojan<sup>2</sup>, RADULOVIĆ Zoran<sup>3</sup>

<sup>1</sup>Singidunum University Belgrade (SERBIA)

<sup>2</sup>Faculty of Law, University of Kragujevac, Kragujevac (SERBIA)

<sup>3</sup>Belgrade Academy of Applied Studies – The College of Tourism, Belgrade (SERBIA)

E-mails: sandradabic2@gmail.com; bojan.urdarevic@gmail.com; zradulovic10@gmail.com

## ABSTRACT

*This paper aims to inspect various problems that appear in regard to different ways of establishing employment relationships and executing employee selection in the Republic of Serbia's higher education system. It is especially important to stress the fact that in establishing an employment relationship in higher education there are prominent elements of public law that differentiate between this type of employment relationship and a standard employment relationship. When we also add that in the higher education system of Serbia, there are two organisational types of higher education institutions - academic and applied studies, it becomes evident that the subject of this article is important to the wider scientific community. Furthermore, in this article, the authors will analyse and point to certain legal and procedural shortcomings regarding the extension of an employment relationship of teachers who have met the conditions for an old-age pension.*

**Keywords:** *establishment of an employment relationship, selection of teachers, academic studies, extension of an employment relationship.*

**JEL:** E24

**DOI:** 10.5937/intrev2304048D

**UDC:** 378:331.5(497.11)

331.5.021:005.334.3

**COBISS.SR-ID** 133868809

## INTRODUCTION

The employment relationship is regulated by Labor Law as the central concept and foundation around which Labor Law builds all its institutions and institutes. The most general way of inspecting an employment relationship is to consider its definition which defines it as a relationship between legal subjects since it is always regulated by stipulations to which their subjects are bound.

Therefore, the establishment of an employment relationship is a process that first and foremost entails meeting general and specific conditions that need to be met in a legal relationship between an employer and an employee in a legally relevant way, and subsequently to set legal actions pursuant to the official regulations. Depending on the complexity and potential specificity of the employment relationship being established, certain regulations are applied.

Regarding the employment relationship of teachers in the higher education of the Republic of Serbia, it can be said that the relationship is very particular, both in comparison to other higher education employees, as well as to the general practice of employment as regulated by the Law on Labor. The establishment of an employment relationship and the procedure of election to the position of a faculty professor are regulated by numerous positive legal regulations, primarily by the Law on Higher Education, statutes of universities and faculties, faculty rulebooks, etc. The very fact that the higher education institutions and faculties within them are entrusted to regulate the procedures of employment and election of candidates to a title with their autonomous acts, leads to the unequal procedure and different regulation of this matter between faculties in Serbia [1]. However, despite the great autonomy of universities and the ability of the faculties to determine the election process for teachers and associates more precisely, the applicants should keep in mind that all acts of a higher education institution must accord with the Law on Higher Education and minimum conditions for teacher election at universities.

## SPECIAL CHARACTERISTICS OF TEACHER EMPLOYMENT RELATIONSHIP IN HIGHER EDUCATION INSTITUTIONS IN THE REPUBLIC OF SERBIA

According to the Law on Higher Education, only full professors and professors of applied studies establish an employment relationship for an indefinite time period. Re-election to the title of associate professors and assistant professors is envisaged for a specific time period, most commonly 5 years. Teaching associates (that teach at the academic or specialist studies of the first degree) enter an employment contract for a one-year period, with the possibility to extend the contract for an additional year, while a person elected to the title of a teaching assistant (PhD students) may enter the employment contract for a period of three years, with the possibility to extend employment for additional three years. The person eligible to be elected as a teaching associate or assistant needs to have finished previous degrees of studies with an overall average grade of 8 (eight), while also meeting other conditions as determined by the general act of the higher education institution if said conditions have been determined [2].

The explanation for such a solution is that it is necessary to create a space for continuous development of the above-mentioned categories of faculty teachers and associates, which would *argumentum a contrario* imply that full professors and professors of applied studies do not have the need for continuous development.

Since the transformation of an employment relationship is disallowed in higher education, as well as education in general, meaning that a fixed-term relationship cannot transform to an indefinite time period, the Framework agreement on fixed-term work, as well as the Directive 1999/70/EC on the position of fixed-term workers cannot be applied. This Directive is of utmost importance since it implements the Framework agreement on fixed-term work and simultaneously sets the minimum conditions for fixed-term work. The Directive dealing with fixed-term work has two goals, the first being to establish the principle of non-discrimination of fixed-term workers, and the other relates to member states being obligated to introduce provisions that will prevent fixed-term worker abuse.

An opinion exists in Labour Law theory which states that typical employment is typified by indefinite employment in an employment relationship with full-time work hours as determined by Law. With this in mind, a question arises: Is the typical (standard) form of the employment relationship a legal form through which the employment of teachers in higher education is manifested? If we begin with the fact that it is determined by positive legal regulations that people elected to the title of a professor of applied studies and full time professors obtain the title and establish an employment relationship for an indefinite period of time, it can be concluded

that every other type of teacher may strictly be employed for a definite time period. In other words, the predominant type of employment for teachers in Serbia's higher education is the fixed-term employment relationship, which differs from the typical status for standard employment relationship.

In the case of a standard employment relationship, a fixed-term employment relationship is the exception to the rule and an employment relationship for an indefinite period of time is the rule. This influences the reasoning behind the legislation in Article 37 of Law on Labor, which specifies the exact conditions under which a person can enter a fixed-term employment relationship. Thus, it is possible to establish an employment relationship for a definite period of time if the timeframe is set in advance and determined, due to objective reasons which can include a deadline for completing certain work or the occurrence of a certain event, as needed. Furthermore, employers may conclude one or more fixed-term contracts with the same person for a definite period of time which is no longer than 24 months, with or without interruptions.

Such departures from ordinary fixed-term employment contracts in higher education are necessitated by the specific nature of the work that teachers do, especially in terms of the need for their development being an elementary condition for them to do their jobs and the need for evaluation of their knowledge and educational capabilities in general. Additionally, higher education must be regulated by positive law in such a way that it can ensure the successful development of this important activity of the country [3].

## **RELATION BETWEEN THE TITLE AND THE EMPLOYMENT RELATIONSHIP OF A TEACHER**

The conditions for election to a title and establishment of employment relationships of teachers are specified by the Law, statute and general acts of the faculties. In principle, election to a title and establishment of an employment relationship is viewed as one. However, if a teacher or an associate is not elected to a position, their employment relationship ends after the period for which the employment relationship was established expires. Ergo, by not being elected, a teacher or an associate loses the title they had had up to the moment of termination of an employment relationship. So, a question is then posed why would a person that met all the general and specific conditions when being elected to a certain title, lose said title that they already obtained by not being elected? We would argue that this solution is unjust and that is not in line with the solutions of some of the countries from our region.

Despite the evident fact that election to a title and establishment of an employment relationship are two essential, deeply related things, we can ask whether it is appropriate to equivocate these two phenomena, from both the perspective of substantive law and that of technical legality. To establish an employment relationship is to establish a legal relationship between an employee and an employer and this matter is clearly and precisely regulated by Labour Law. In essence, the establishment of an employment relationship between an employee and an employer is no different to the establishment of an employment relationship between a teacher and an institution of higher education. Specifically, the provision of Article 75, paragraph 6 of the Law on Higher Education clearly specifies that "an employment contract with a person elected to the position of teacher shall be entered into by the executive body of the higher education institution."

By nature, the dean or the director of a higher education institution is not able to write reports or proposals for title election with sufficient competence due to the simple fact that one person is never competent enough to appropriately make that choice. Perhaps one of the biggest shortcomings of the Law on Higher Education is exactly this: that it has not explicitly determined if a professional body does everything that pertains to naming the members of committee which writes the report for the title election and deliberating its proposal. In practice, to make up for this deficiency, higher education institutions autonomously rectified the matter in question with their general acts.

University teachers must have qualifications that guarantee a certain level of competence in working in the field of science, which is further proven by the publication of relevant materials in classified scientific journals, publication of textbooks, and monographs, participation in science projects, etc. Compared to a university, the Academy of Applied Sciences is "an independent higher education institution that in its work brings together educational, applied research, scientific and artistic work, as components of a unique process of higher education." From this legal definition, it is clear that the requirements will be significantly lower compared to the competencies of teachers at institutions for so-called applied studies due to the absence of the function of doing scientific research which requires the teachers to be involved in scientific research and write papers whereby their activity will be validated.

As a result of the things mentioned above, teachers with a title obtained at universities can be employed to teach at so-called applied studies, i.e. schools of applied studies and academies of applied studies, and teachers with a title they obtained at schools of applied studies cannot be employed to teach at institutions for academic studies. Regarding this, it should be noted that there many teachers who obtain their titles at academic studies institutions work at higher education institutions for applied studies.

## **EXTENSION OF AN EMPLOYMENT RELATIONSHIP**

According to the Article 93 of the Law on Higher Education, a teacher's employment relationship is terminated at the end of the school year in which he/she turned 65 years of age and had the length of insurance coverage of at least 15 years. It is important to notice that, compared to the general employment practice, whereby men and women will become equal in terms of conditions for old-age pension only in 2032, the limit is set on an equal level from the start in the case of higher education. Ergo, all teachers, regardless of sex, meet the equal condition for an old-age pension.

At the same time, Law on Higher Education specifies that the higher education institution can extend the employment relationship with the teacher that meets the conditions for old-age pension for a definite period of time no longer than two years and at the most until the end of the school year in which the teacher turns 70 years of age. More specific criteria for entering into an employment contract after 65 years of age are set by the National Council of Higher Education.

This provision does not explicitly specify what is to be considered a "need for the teacher's work" which makes it too vague. The particularity of a teacher's position in Labour Law lies in the fact that their employment relationship is tied to the end of a school year and not to just any moment in time as is the case in the general employment practice regulated by Labour Law. The faculty's professional body, as is the faculty (in the meaning of "a body consisting of teachers at the faculty"), should grade how justified the need for the teacher to work is, after which the Teaching and Scholarly Council will deliberate on the teacher's application for employment relationship extension.

Employment relationship extensions are regulated by faculties in their statutes and other general acts, but they are obligated to specifically determine the cases where the number of teachers as required for unhindered teaching is insufficient, as well as whether or not the teacher who applied for an extension of employment relationship has achieved exceptional results in the fields of science and art. Some faculties also require a teacher who applies for an extension of their employment relationship to meet the condition of having extraordinary contribution to teaching and youth research at the institution.

When it comes to employment relationship extension, what is somewhat curious is the fact that even if the Teaching and Scholarly Council reaches a positive decision on the request for an extension of an employment relationship with a certain teacher, the extension does not necessarily have to materialise. Namely, a positive decision on those matters is then brought to the Senate of the higher education institution, the only body which is authorized to make the final decision. From the perspective of Labour Law, such a procedure is unusual, since the teacher is not in any legal relationship with the higher education institution, but with the faculty as its part. In that sense, the employer of a faculty teacher is not the university, but rather the Dean who in the name of a given faculty enters into an employment contract for a definite or an indefinite period of time with the teacher.

A very contentious question is what occurs in a case in which the Senate does not reach a decision about the extension of an employment relationship as proposed by the Teaching and Scholarly Council. Regarding the maintenance and protection of rights which stem from the employment relationship, a teacher should file a lawsuit to the basic court, but in that case, the party being sued would have to be the faculty that reached a positive decision on the teacher's proposal, in which case the lawsuit would be pointless because there is no reason to sue someone who decided in your favour. From the viewpoint of administrative law, actions of the Senate can be viewed as administrative silence in its own right, against which it is possible to start an administrative dispute but such a dispute will not be decided in a dispute of full jurisdiction, that is, the administrative court is not authorised to return the teacher to work and provide him/her with the extension of an employment relationship. The extension of an employment relationship is an autonomous right of the employer, but only in this case, the body that "does not allow" the extension of an employment relationship is not the employer, given the already stated fact that no legal relationship exists between the teacher and the body of a higher education institution (university).

Therefore, it is often stated in the literature that in terms of extending the employment relationship of a teacher, the situation is clearer and better at an integrated university or a private one [4]. It is obvious that the extension of an employment relationship must be viewed as an exception, but it has to be connected to the continuation of a teacher's employment relationship, and also alongside clear and precise conditions, specified by the Law [5]. It is only in the said manner that the right to work guaranteed by the Constitution can be ensured, the quality of the teaching process maintained and at the same time, discrimination on the basis of age avoided.

## CONCLUSION

This article aimed to point out certain specific characteristics of establishing and extending the employment relationships for university teachers.

The establishment of an employment relationship for teachers in higher education of the Republic of Serbia is significantly different compared to the establishment of a standard employment relationship. Those differences are for the most part manifested in the obligatory existence of a specific condition – election to a title of teacher that is defined by law and in practice autonomously regulated, which far more strictly and in more detail conditions the selection of candidates.

In terms of establishing an employment relationship, it appears necessary to differentiate the procedure of election to a title from the process of establishing an employment relationship. The title which has been obtained should not be abrogated due to the fact of not being elected, but rather only as a result of situations specified by law.

Also, a question can be posed about the lack of precise jurisdiction of the professional body in the procedure of establishing employment relationships teaching staff at institutions of higher education. In regard to this, the Law has enabled the possibility for a higher education institution to form a committee of teachers from other institutions in order to make the reports for electing teachers to a title. This begs the question of why this occurs when, for example, an institution has teachers precisely in the field for which an election to a title is being carried out. In our opinion, it would be justified if one member of the committee always came from a different institution in order to respect the principles of objectivity and public disclosure.

Finally, the stability of employment that is strived for should be understood as an important element of the status of faculty teachers and associates in respect of Labour Law. Therefore, it is important to protect them from competent authorities that have an impact on the status of these persons from the perspective of Labour Law.

## REFERENCES

- [1] Dorđević, S. (2019). Advantages and Disadvantages of an Integrated University [original title: Prednosti i nedostaci intergisanog univerziteta]. In: M. Mićović (Ed.) *Freedom to Provide Services and Legal Security* [original title: Sloboda pružanja usluga i pravna sigurnost], Institute for Legal and Social Sciences, Faculty of Law, Kragujevac, p. 749-755.
- [2] Ivošević, Z. (2021) Labour Law - Updated and Expanded Explanations and Interpretations [original title: Zakon o radu - dopunjena i unapređenja objašnjenja i tumačenja], Official Gazette, Belgrade.
- [3] Matić, D. (2017). A Draft of the Law on Higher Education and New Services in Higher Education [original title: Nacrt Zakona o visokom obrazovanju i nove usluge u visokom obrazovanju]. In: Mićović, M (Ed.) *Services and Responsibilities* [original title: Usluge i odgovornost], Faculty of Law, Kragujevac, p. 805-813.
- [4] Misailović, J. (2021). Guide for the Persons whose Rights Have Been Infringed in the Procedure of Election to Academic Titles [original title: Vodič za lica čija su prava povređena u postupku izbora u akademska zvanja], Open Society Foundation, Belgrade, p. 9.
- [5] Radulović, Z. (2008). Position of Teachers in Higher Education in Labour Law [original title: Radnopravni položaj nastavnika u visokom obrazovanju], *Journal for Theory and Practice of Labour and Social Law*, Belgrade, p. 382.

### Article history:

Received 5 November 2022

First revision 15 December 2022

Accepted 13 January 2023

# INTERPLAY BETWEEN TECHNOLOGY AND SOCIETY: EFFECTS OF REMOTE EMERGENCY TEACHING ON UNDERGRADUATE STUDENTS' PERFORMANCE

ŠTILIĆ Andelka<sup>1</sup>, Krstić Boro<sup>2</sup>, PUŠKA Adis<sup>3</sup>, NICIĆ Miloš<sup>4</sup>

<sup>1,4</sup>Academy of Applied Studies Belgrade, The College of Tourism, Belgrade (SERBIA)

<sup>2,3</sup>Faculty of Agriculture, Bijeljina University, Bijeljina, (BOSNIA AND HERZEGOVINA)

E-mails: andelka.stilic@assb.edu.rs; direktor@ubn.rs.ba; adispuska@yahoo.com; milos.nicic@assb.edu.rs

## ABSTRACT

*The primary objective of this research paper is to investigate the potential impact of emergency remote teaching on the academic performance of undergraduate students, while also assessing the consistency of academic outcomes across various courses during the emergency transition to distance learning. The research methodology involves the collection of students' accomplishments and course passing rates spanning four consecutive academic years, from 2018/2019 to 2021/2022. The study identifies three distinct teaching environments: traditional, distance learning, and hybrid. The academic year 2018/2019 is designated as a pre-pandemic reference point. The subsequent years mark a transition from distance learning to a hybrid teaching model and a return to the traditional in-class environment. The analytical framework includes descriptive and correlation analyses, supplemented by an analysis of variance to derive meaningful insights. It is essential to highlight that the results obtained are further validated by the passing rates for the academic year 2022/2023, reinforcing the contemporary relevance and credibility of the research findings.*

**Keywords:** Academic Performance, Emergency Remote Teaching, Undergraduate Achievements, Distance Learning Impact, Hybrid Teaching Models

**JEL:** O33, I23

**DOI:** 10.5937/intrev2304053S

**UDC:** 316.644-057.875: [37.018.43:077(497.11)]"2020/2021"

**COBISS.SR-ID** 133878281

## INTRODUCTION

Modern students belong to a mobile "homuter" society [1] as they consider their mobile phones, tablets, computers, and other information communication technology (ICT) not only as inseparable parts of themselves but also as the primary means of communication and mediums for acquiring knowledge. The rapid spread of technology has resulted in virtualization [1], i.e., when an individual's basic social needs are satisfied by computers and/or mobile devices. This has given rise to an entirely new phenomenon called "cyber-socialization"[2]. In this light, traditional didactic lectures become outdated teaching methods quite fast. To satisfy the needs of modern students, a teacher's toolkit should include a variety of recent, cutting-edge pedagogical approaches, educational technologies, and teaching strategies [3]. In modern times, these should be added to existing lectures or used instead of the conventional lecture format.

Three distinct teaching and learning environments are identified when discussing them: traditional face-to-face (F2F) classroom education, distance learning, also known as e-learning, and a hybrid format that may offer the "best of both worlds" [4][5]. Technologies-in-practice are thought to be responsive to students' knowledge, practices, and contextual factors [6]. However, technology itself might change as a result of its use [7]. On the other hand, earlier studies [7] suggest that students may tend to favor their own mobile technologies while using a variety of distance learning platforms [8]. The state of "emergency remote teaching," or ERT [4], arose as a stopgap measure to an immediate crisis caused by the Covid-19 pandemic. Findings [4] demonstrate that video conferencing platforms and learning management systems (LMS) are the two categories of online tools and resources that most institutions use. Online tools like Canvas, Blackboard, Google Classroom, and Microsoft Teams are among the most widely used ones, along with Moodle, Zoom, WhatsApp, and Viber.

Given that many higher education institutions decided to offer distance learning and/or hybrid teaching and learning environments, synchronously or asynchronously, to comply with Covid-19 safety regulations [5] or were required to, the Covid-19 pandemic gave researchers the chance to investigate potential connections between the methods used and measurable outcomes. The following research questions are aimed to be answered in this paper:

### ***Research question 1***

Has students' academic performance in undergraduate studies been impacted by emergency remote teaching?

### ***Research question 2***

Is students' academic performance in the emergency transition to e-learning the same on the institutional level throughout all courses?

This paper undertakes an examination of the potential impacts of emergency remote teaching within the context of the Covid-19 pandemic on the academic achievements of undergraduate students. This analysis is based on the passing rates in exams conducted during the observed period, aiming to provide insights into the research questions posed earlier. To reinforce the conclusions drawn, the obtained results will be compared with those derived from conventionally held face-to-face (F2F) classes. Understanding the variations in academic performance is deemed crucial for institutional-level planning and decision-making. The outcomes of this study have implications not only for other courses and educators but also for the formulation of policies addressing emergency situations, extending beyond pandemics.

The paper follows a structured format, with Section 2 offering a review of teaching methods employed in distance learning, alongside emergency teaching methods implemented during the Covid-19 era. The initial part of this section delineates these methods, followed by a comprehensive overview of the materials and methods deployed to assess student performance across different teaching environments. Moving forward, Section 3 presents the study's results, while Section 4 engages in a discussion of the findings. Finally, Section 5 encapsulates the most significant conclusions, outlines limitations, and provides recommendations for future research.

## MATERIALS AND METHODS

### *Research background*

Traditional teaching methodologies, such as didactic, practical, and expository learning, are typically used in the classroom environment and are brought by the lecturers [9]. Teaching methodologies in traditional classrooms are primarily focused on the lecturer. In this setting, the lecturer presents the problem-solving component through lectures and discussions, and the lecturer conveys to the class the curriculum and instructional materials [10]. Some benefits of traditional teaching methodologies might be seen in the fact that the lecturer's presence alone [11] can motivate, encourage, and remind students to finish their work during traditional lectures or in experimental exercises [12]. Traditional learning environments and interactivity in classrooms also support the growth of socialization abilities and emotional engagement [13]. Last but not least, traditional classroom settings allow for standardized and controlled knowledge testing. However, it is argued that traditional teaching results in inert knowledge in students, that is, knowledge that can be applied in educational contexts but cannot be applied in real-world settings [9]. Traditional teaching is frequently regarded as archaic [14] and has a number of drawbacks, including the lack of feedback on students' learning and the presumption that all students progress at the same rate [15]. Traditional learning settings emphasize listening, which disadvantages students with alternative learning styles; when listening passively to lectures, students' interest quickly wanes and information is quickly forgotten [16].

The Covid-19 pandemic prompted a change in the teaching environment [17] for the 2019/2020 academic year. The need for an emergency remote teaching environment arose in a very short period, as the institutions were physically closed as a result of the Serbian government's movement restrictions and the Ministry of Education's mandatory recommendations. We were able to observe three different teaching methodologies in this setting. First, self-learning could be defined as distance learning without the presence of a lecturer or a student and without the use of electronic communication [18]. Second, asynchronous teaching methodology could be defined as distance learning without the presence of a lecturer or student but with the use of electronic communication between them [19]. Lastly, synchronous teaching methodology could be defined by the virtual presence of a lecturer or student while communicating electronically [20][21]. As one of the tenets of the Law on Higher Education in Serbia states that teaching methodologies are at full liberty, and as there are no clear guidelines or standardized e-learning procedures for teachers to follow on how to conduct lectures in the case of emergency remote teaching, the three most popular methodologies were identified in this research. The self-learning teaching environment in this remote teaching emergency scenario implied students' own engagement with pre-existing resources. Asynchronous teaching methods entailed creating web-based presentations and book clippings, while online tools such as Google Classroom, Microsoft Teams, as well as Skype, Zoom, WhatsApp, and Viber [22], were used in a synchronous teaching environment. The ability of both lecturers and students to adapt to this new reality was tested [23]. In adherence to the principles of the Law on Higher Education in Serbia, teaching methodologies were at the discretion of educators, lacking clear guidelines for emergency remote teaching. Three prevalent methodologies emerged in this research: self-learning, where students engaged with pre-existing resources; asynchronous teaching, incorporating web-based presentations and book clippings; and synchronous teaching, utilizing online tools like Google Classroom, Microsoft Teams, Skype, Zoom, WhatsApp, and Viber [22]. The adaptability of both lecturers and students to this new reality was put to the test [23].

Under "normal" circumstances, the teacher serves as both the focal point and the primary point of reference for the teaching and learning process. One of the primary responsibilities of the lecturer is to instruct the students in the classroom by lecturing, explaining, and describing the subject in the traditional rhetorical manner [18] (Musa & Momani, 2022). The effectiveness of traditional teaching methodologies depends on the efforts made by the lecturer in the classroom. The lecturer in distance learning, on the other hand, must be capable of structured planning of the entire teaching and learning environment in advance in terms of designing the course and employing special instructional techniques while communicating on-line [24]. A hybrid-teaching model combines traditional and distance teaching and learning methodologies for the same subjects at the same time [25]. In this scenario, lecturers have a unique opportunity to provide students with access to information even outside of the classroom through hybrid learning. This contributes to increasing each student's productivity during F2F lessons [26].

In response to the challenges posed by the Covid-19 pandemic and the changing educational landscape, institutions like the College of Tourism recognized the imperative to adapt. Established in 1967, the College acknowledged the necessity of staying current amidst unprecedented global changes. To address the dynamic educational environment shaped by the pandemic, the College strategically initiated the integration of technology-enhanced learning [27]. This study spans four consecutive academic years, from 2018/2019 to 2021/2022, focusing on students' achievements and course passing rates across three distinct teaching environments: traditional, distance learning, and hybrid. The academic year 2018/2019 served as a pre-pandemic baseline, with the subsequent two years characterized by a transition from emergency remote teaching, initially necessitated by the Covid-19 crisis, to a hybrid teaching environment—representing a return to the traditional, in-class teaching setting.

## ***Methodology***

Teaching modalities refer to the ways in which education is delivered to students. Traditional teaching involves F2F interaction between students and teachers in a physical classroom setting. Hybrid teaching combines traditional F2F instruction with online learning, while online learning takes place entirely through digital means. In recent years, the shift towards online and hybrid learning has been accelerated by the Covid-19 pandemic, which has caused many schools and universities to move towards remote learning.

Several studies have been conducted to assess students' perspectives on these different teaching modalities. A survey of university students at Kansas City University found that students preferred a blend of online and in-person instruction, with almost 90% of students reporting that they prefer a hybrid approach [28]. The study found that students valued the flexibility and convenience of online learning while also recognizing the importance of in-person interaction and support from teachers. Another study [29] found that students reported feeling isolated and disconnected from their peers and instructors in fully online classes. Additionally, students reported feeling overwhelmed by the amount of material covered in online classes and struggling to stay engaged in the course. Despite these challenges, many students have reported positive experiences with online learning, particularly in terms of flexibility and the ability to learn at their own pace. With 97% of the survey participant stating that online learning format of learning is easy to use [30], and further answers discovered that they enjoyed the flexibility of online learning and appreciated the ability to work at their own pace. Also, it is important to note that results [31] showed that a majority of students, 73%, have a preference for online/hybrid mode when it comes to theory-based courses. In contrast, only 27% of students preferred the F2F mode of learning. Conversely, the majority of students, 77%, favored F2F learning for courses that were practice-based, with 19% preferring hybrid, and just 4% opting for a fully online mode.

For the purpose of investigating whether teaching modality has an impact on students' academic performance, four consecutive academic years, from 2018/2019 to 2021/2022, were observed through students' achievements and course passing rates. During this period, three different teaching environments were implemented: traditional, distance learning, and hybrid. The 2018/2019 academic year is regarded as a pre-pandemic reference point, with the following two transitioning from distance learning as an emergency remote teaching necessity to a hybrid-teaching environment. The latter, on the other hand, represents a return to the traditional, in-class teaching environment.

A data set, namely the passing rates of students on 60 courses from the applied studies program at The College of Tourism, Belgrade (Serbia), was gathered in order to achieve the research's goal. In this study, the exam passing rates of students for the academic years 2018/2019, 2019/2020, 2020/2021, and 2021/2022 are examined. The courses were held over the observed period, and they are labeled with generic 1 to 60 numeration. This is because data sets used in this research are not available to the public. The passing rate for each academic year represents the mean of six regular examination periods. Data was obtained from the schools' database, and in Figure 1, the passing results are displayed.

Course	18/19	19/20	20/21	21/22	Sparkline	Course	18/19	19/20	20/21	21/22	Sparkline
COURSE ID 1	52,30%	50,69%	63,33%	59,02%		COURSE ID 31	100,00%	100,00%	100,00%	100,00%	
COURSE ID 2	71,43%	73,81%	70,59%	55,56%		COURSE ID 32	57,92%	83,82%	86,92%	71,43%	
COURSE ID 3	53,33%	100,00%	100,00%	100,00%		COURSE ID 33	75,89%	96,52%	94,50%	93,51%	
COURSE ID 4	62,46%	66,08%	89,30%	68,45%		COURSE ID 34	83,67%	88,36%	91,60%	87,63%	
COURSE ID 5	63,16%	100,00%	90,00%	100,00%		COURSE ID 35	77,50%	89,47%	77,27%	76,86%	
COURSE ID 6	55,03%	65,45%	26,54%	68,31%		COURSE ID 36	92,62%	84,00%	95,45%	94,74%	
COURSE ID 7	53,52%	76,16%	58,80%	58,52%		COURSE ID 37	100,00%	99,57%	100,00%	100,00%	
COURSE ID 8	67,92%	67,74%	87,71%	57,35%		COURSE ID 38	85,11%	100,00%	75,76%	100,00%	
COURSE ID 9	100,00%	100,00%	50,00%	100,00%		COURSE ID 39	51,47%	56,32%	39,71%	32,65%	
COURSE ID 10	80,77%	95,45%	91,67%	100,00%		COURSE ID 40	52,05%	84,56%	91,67%	94,69%	
COURSE ID 11	67,65%	71,43%	100,00%	78,57%		COURSE ID 41	78,95%	78,57%	80,95%	100,00%	
COURSE ID 12	57,14%	84,62%	100,00%	100,00%		COURSE ID 42	88,93%	97,65%	97,33%	83,89%	
COURSE ID 13	100,00%	100,00%	100,00%	100,00%		COURSE ID 43	90,87%	78,79%	79,37%	82,02%	
COURSE ID 14	88,89%	100,00%	100,00%	100,00%		COURSE ID 44	97,33%	97,56%	96,23%	96,40%	
COURSE ID 15	100,00%	100,00%	100,00%	100,00%		COURSE ID 45	75,00%	42,86%	50,00%	100,00%	
COURSE ID 16	87,27%	84,62%	92,86%	100,00%		COURSE ID 46	90,91%	50,00%	35,71%	42,86%	
COURSE ID 17	64,94%	66,18%	73,81%	96,77%		COURSE ID 47	100,00%	81,82%	66,67%	80,00%	
COURSE ID 18	62,12%	76,14%	77,36%	89,66%		COURSE ID 48	74,29%	61,19%	43,55%	88,46%	
COURSE ID 19	76,03%	88,89%	78,21%	85,71%		COURSE ID 49	88,64%	60,00%	52,38%	68,75%	
COURSE ID 20	32,53%	33,51%	34,42%	33,06%		COURSE ID 50	90,74%	61,90%	44,44%	52,63%	
COURSE ID 21	100,00%	93,55%	100,00%	85,71%		COURSE ID 51	99,23%	100,00%	80,00%	90,12%	
COURSE ID 22	70,07%	74,39%	65,43%	90,91%		COURSE ID 52	100,00%	100,00%	100,00%	98,48%	
COURSE ID 23	64,13%	70,41%	77,61%	84,78%		COURSE ID 53	86,52%	98,28%	96,98%	97,27%	
COURSE ID 24	90,67%	82,35%	62,04%	84,91%		COURSE ID 54	77,86%	58,44%	61,62%	57,62%	
COURSE ID 25	97,33%	94,87%	88,89%	100,00%		COURSE ID 55	34,35%	76,74%	65,30%	66,30%	
COURSE ID 26	97,40%	100,00%	97,92%	99,30%		COURSE ID 56	93,10%	83,67%	100,00%	83,33%	
COURSE ID 27	91,91%	90,55%	48,51%	71,97%		COURSE ID 57	71,43%	100,00%	100,00%	75,00%	
COURSE ID 28	77,48%	95,65%	88,24%	92,00%		COURSE ID 58	100,00%	99,26%	90,91%	92,86%	
COURSE ID 29	87,50%	100,00%	100,00%	100,00%		COURSE ID 59	70,00%	86,25%	67,15%	65,25%	
COURSE ID 30	100,00%	77,78%	80,00%	100,00%		COURSE ID 60	88,33%	95,45%	84,44%	60,00%	

**Figure 1.** Detailed passing rate over 2018/2019, 2019/2020, 2020/2021 and 2021/2022 academic years.

Throughout these academic years, various teaching methods were employed. A typical academic year without a Covid-19 pandemic and with traditional teaching environments was the academic year of 2018/2019. Due to the emergence of the Covid-19 virus in Serbia in late 2019, emergency remote teaching in the form of a distance-learning environment was employed during most of the 2019/2020 academic year. Throughout the academic year 2020/2021, the teaching environment needed to be hybrid, combining F2F and distance learning, in accordance with the government's restrictions and recommendations that were adjusted to the current Covid-19 numbers. The academic year 2021/22 represents the post-Covid era in which the traditional teaching environment predominates. As a necessary consequence, it is important to investigate how different teaching and learning environments affect exam passing rates. In this light, four hypotheses are set based on the research background regarding various teaching techniques and shifting teaching environments from the 2018/2019 to 2021/2022 academic years.

**H1.** Student academic achievement is not influenced by the teaching environment.

**H2.** Passing rate is lower in traditional (classroom) environments compared to distance learning.

**H3.** Passing rate is higher in traditional (classroom) environments compared to hybrid learning.

**H4.** Passing rates are higher in the post-Covid period compared to traditional (classroom) environments.

In the pursuit of addressing the research inquiries and scrutinizing the validity of the hypotheses, a methodologically diverse approach will be undertaken. The Analysis of Variance (ANOVA), a statistical tool recommended by scholars such as Calamlam et al.[32], Göksu et al. [33], and Hamaidi et al.[34], will be employed to probe the initial hypothesis (H1). This analysis aims to discern potential disparities in the average passing rates across all academic years, providing nuanced insights into overarching trends in academic performance.

Following this, the study will deploy the t-test, a statistical technique endorsed by researchers like Kamal et al. [35], Permana et al. [36] and Rozal et al.[37]. This test will be instrumental in evaluating hypotheses H2, H3, and H4, engaging in a comparison of the arithmetic means of distinct groups to uncover statistically significant differences in passing rates. This approach allows for a focused

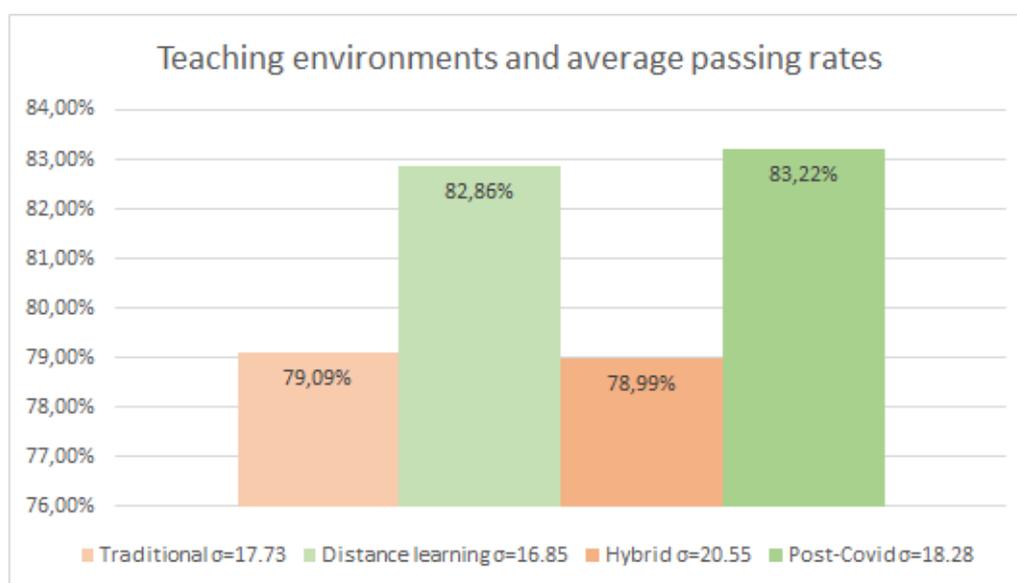
exploration of specific academic scenarios. Concurrently, a descriptive analysis will be conducted, drawing on methodologies advocated by Dewi & Muslikah [38], Rizvi & Nabi [39] and Safa & Wicaksono [40]. This method will provide a succinct summary of students' passing rates, employing measures such as mean, median, and standard deviation to highlight key features of the dataset, thereby enriching the contextual understanding. Furthermore, the study will delve into the relationship between passing rates of individual courses by academic year. Through the calculation of correlations and examination of associations, this facet of the methodology aims to contribute to a more nuanced comprehension of performance trends within specific courses.

The research findings will be fortified through validation by considering the passing rates for the academic year 2022/2023. This additional step serves to enhance the contemporaneous relevance and credibility of the results, ensuring consistency across multiple academic years and reinforcing the robustness of the research outcomes.

By integrating these methodologies, the study endeavors to present a comprehensive and rigorously executed analysis, shedding light on the intricate dynamics of different teaching environments on students' academic performance and making meaningful contributions to the academic discourse.

## RESULTS

To establish a benchmark for emergency remote teaching, hybrid environments, and the post-pandemic "back-to-school" reality, the pre-pandemic passing rate for the 2018/2019 academic year was utilized. During the pre-pandemic teaching environment, a passing rate of 79.09% was achieved, and subsequent three academic years exhibited fluctuations (Figure 2). Descriptive analysis findings indicate that the passing rate for the academic year 2021/22 was the highest (mean: 83.22%), while the academic year 2020/21 had the lowest passing rate (mean: 78.99%). Assessing the deviation from the average passing rate values using standard deviation, the academic year 2020/21 exhibited the greatest dispersion ( $SD = 20.55$ ), whereas the academic year 2019/20 had the smallest dispersion ( $SD = 16.85$ ). This dispersion signifies deviations from the average, with greater deviation indicating a more significant deviation from the average value, and vice versa.



**Figure 2.** Teaching environments and average passing rates from 2018/2019 to 2021/2022

Following the descriptive analysis, an exploration of the relationship between the passing rate by individual academic years for individual courses was conducted (Table 1). Correlation analysis results revealed the highest correlation ( $r = 0.723$ ) between the academic years 2019/20 and 2020/21, while the lowest correlation ( $r = 0.320$ ) existed between the academic years 2018/19 and 2020/21. Significantly, the correlation between academic years was established at the 5% level ( $p < 0.05$ ), whereas the

connection of academic years was established at the 1% level ( $p < 0.01$ ). This allowed the conclusion that there was a significant relationship of passing rates with academic years.

**Table 1. Correlation of passing rates by academic year**

	2018/19	2019/20	2020/21	2021/22
2018/19	1.000	0.513**	0.320*	0.452**
2019/20	0.513**	1.000	0.723**	0.660**
2020/21	0.320*	0.723**	1.000	0.626**
2021/22	0.452**	0.660**	0.626**	1.000

\*\* Correlation is significant at the 0.01 level (2-tailed).

\* Correlation is significant at the 0.05 level (2-tailed).

Testing the first hypothesis (H1) involved using ANOVA analysis to determine whether passing rates differed across academic years. The results indicated no statistically significant connection in the observed academic years (Table 2), demonstrating no significant difference in the observed periods (F-test = .948,  $p = .418$ ). Consequently, the first research hypothesis (H1), asserting that student academic achievement was not influenced by the teaching environment, was confirmed.

**Table 2. ANOVA analysis results**

Source	Type III Sum of Squares	df	Mean Square	F-test	Sig.
Academic year	963.728	3	321.243	.948	.418
Error	79930.527	236	338.689		
Total	1657076.873	240			

The t-test was employed to investigate the remaining hypotheses (Table 3). The second hypothesis, examining the academic years 2018/2019 and 2019/2020, revealed no statistically significant difference between the observed groups (t-test = -1.191,  $p = .236$ ). However, a comparison of teaching/learning environments indicated that the second group had a higher passing rate, suggesting that distance learning produced better results than the traditional teaching environment, thereby accepting the second research hypothesis.

**Table 3. T-testing**

Hypothesis	t-test	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference
H2	-1.191	118	.236	-3.76133	3.15812
H3	.031	118	.975	.10900	3.50360
H4	-1.255	118	.212	-4.12700	3.28757

The third hypothesis of this research (H3) was examined in such a way that the academic year 2018/2019 (traditional teaching environment) was observed as the first group, while the academic year 2020/2021 (hybrid teaching environment) was observed as the second group. The results of H3 hypothesis' research revealed that there was no statistically significant difference between the observed groups (t-test = .031,  $p = .975$ ). However, by comparing the means, it was fairly obvious that the academic year 2018/2019 had a higher average passing rate than the academic year 2020/2021, confirming the third hypothesis of this research.

The academic years 2018/2019 and 2021/2022 were taken into consideration when analysing the fourth research hypothesis (H4). There was no statistically significant difference between the observed academic years, according to the t-test results (t-test = -1.255,  $p = .212$ ). By observing the difference in the teaching and learning environment, it was noticeable that the passing rate was higher in the academic year 2021/2022 compared to the academic year 2018/2019, supporting the fourth hypothesis of this research.

While this research found no statistically significant difference between the observed academic years in terms of exam passing rates, small variations were noted. The result of the third research hypothesis was the least significant, with a difference of less than 1% (.10900).

To enhance the contemporary relevance and credibility of our findings, we meticulously integrated passing rates for the most recent academic year (2022/2023), concluding in October 2023. The recorded passing rate of 83.67% for this year not only harmonizes seamlessly with the established trends observed

over the years but also furnishes real-time evidence that substantiates the hypothesis positing higher passing rates in the post-Covid period compared to traditional (classroom) environments. This recent addition significantly strengthens the validity and applicability of our research findings, offering a dynamic and up-to-date perspective on the continuously evolving educational landscape. The incorporation of this latest data underscores the persistence of the observed patterns and further supports our contention regarding the enduring influence of the post-Covid period on academic outcomes.

## DISCUSSION

Following the comprehensive descriptive analysis conducted, the results of the correlation analysis shed light on a significant relationship between students' passing rates and academic years. However, the subsequent ANOVA analysis revealed that the observed variations in passing rates on individual courses across academic years lack a statistically significant connection. This affirmation supports the initial hypothesis (H1) that the academic achievement of students remains unaffected by the teaching environment. Despite the lower passing rates in traditional learning environments compared to distance learning (H2), higher rates in traditional settings compared to hybrid learning environments (H3), and further elevation in the post-Covid period compared to traditional environments (H4), a pivotal question emerges: What underlies the oscillation in mean passing rate values?

Although no statistically significant difference exists between the passing rates of the 2018/2019 and 2021/2022 academic years ( $t$ -test = -1.255,  $p$  = .212), a comparison of the means reveals a 4.13% difference. Both academic years represent a traditional (classroom) teaching environment, with the former belonging to the pre-Covid era and the latter to the post-Covid era. This shift is attributed to the acquisition of new teacher competencies cultivated through the challenges posed by emergency remote and hybrid teaching environments.

In the ever-evolving landscape of education, the traditional classroom setting is no longer the exclusive domain for learning. The expansive and dynamic nature of digital and distant environments necessitates substantial adaptation, thoughtful planning, and robust support systems. Students today expect to access information from a diverse array of digital resources and have the ability to contribute their own material when necessary. The integration of technology as a catalyst for learning has led to the development of "learning landscapes," wherein various methodologies are combined to create courses that cater to the unique needs of each student. It is imperative to note that the ongoing changes in teaching and learning environments are not exclusive to students; lecturers must also adapt to these transformations. ICT has evolved into a pivotal pedagogical tool, playing a crucial role in innovative teaching and learning processes [41]. Students exhibit enthusiasm for leveraging ICT and Industry 4.0 technologies as educational tools [42]. The impact of innovation on teaching and learning environments underscores the importance of teacher competencies, which are vital for effective and high-quality teaching [43]. However, the extent to which teachers are willing to adapt and enhance their work as reflective practitioners ultimately determines the innovativeness of their classrooms [44].

The nuances in passing rates and the dynamic interplay between teaching environments underscore the multifaceted nature of contemporary education. The integration of technology and the continuous evolution of teaching methodologies demand a holistic approach that considers the adaptability of both students and teachers to effectively navigate the challenges and opportunities presented in the ever-changing landscape of education.

## CONCLUSIONS

The integration of technology-enhanced learning into educational systems has been significantly facilitated by advancements in ICT and mobile technologies [27]. This research explores the discernible impact of emergency remote teaching and distance learning on the academic performance of undergraduate students.

The notable increase in passing rates during the 2019/2020 academic year within the emergency remote teaching environment marked a pivotal period. The subsequent return to traditional teaching in the 2021/2022 academic year exhibited a positive trajectory in students' passing rates, attributed to the successful incorporation of new teacher competencies cultivated through experiences in emergency

remote and hybrid teaching environments. These competencies are now effectively applied in the post-Covid traditional classroom setting.

Aligning with recommendations by Stanišić et al.[45], the study underscores the critical need for increased budgetary funding to upgrade educational facilities, enhance curriculum quality, and promote information literacy. Information literacy emerges as a pivotal facet benefiting both students and lecturers, acting as a protective shield against online abuses while potentially enhancing future work capacity.

The adaptability of the education system to the exponential growth of global knowledge relies on the unwavering commitment of teaching staff to engage in continuous daily and lifelong learning. Governing bodies play a crucial role in allocating resources to equip classrooms with essential technology, fostering an environment conducive to the accelerated evolution of modern teaching/learning methodologies [46]. Emphasizing the role of information and communication technologies, particularly 4.0 technologies, is imperative as they assume an increasingly central role in education.

However, it is essential to acknowledge the limitations inherent in the absence of standardized distance learning procedures during the emergency remote teaching environment. Future research should scrutinize specific teaching methods employed across individual courses, providing nuanced insights into varied approaches rather than focusing solely on overall average student accomplishments. This nuanced approach will pave the way for the formulation of comprehensive guidelines applicable to future emergency or distance learning scenarios. In navigating the dynamic landscape of education, this study underscores the ongoing need for adaptability, innovation, and a commitment to lifelong learning for educators and institutions alike. Future research in the field could further explore the benefits of incorporating interactive course materials in modern teaching and learning environments, standardizing distance-learning procedures, and the impact of promoting information literacy on students and lecturers' future working capacity and protection from online abuse.

## ACKNOWLEDGEMENTS

As data sets used in this research are not available to the public, we would like to thank the Academy of Applied Studies Belgrade and The College of Tourism for providing the necessary data on students passing rates over the academic years.

## REFERENCES

- [1] Burdina, G. M., Krapotkina, I. E., & Nasyrova, L. G. (2019). Distance Learning in Elementary School Classrooms: An Emerging Framework for Contemporary Practice. *International Journal of Instruction*, 12(1), 1–16. <https://doi.org/10.29333/iji.2019.1211a>
- [2] Gaol, F. L., & Hutagalung, F. D. (2017). Social Interactions and Networking in Cyber Society. Springer Publishing. <https://doi.org/10.1007/978-981-10-4190-7>
- [3] Sivarajah, R. T., Curci, N. E., Johnson, E. M., Lam, D. L., Lee, J. T., & Richardson, M. L. (2019). A Review of Innovative Teaching Methods. *Academic Radiology*, 26(1), 101–113. <https://doi.org/10.1016/j.acra.2018.03.025>
- [4] Nazempour, R., Darabi, H., & Nelson, P. C. (2022). Impacts on Students' Academic Performance Due to Emergency Transition to Remote Teaching during the COVID-19 Pandemic: A Financial Engineering Course Case Study. *Education Sciences*, 12(3), 202. <https://doi.org/10.3390/educsci12030202>
- [5] Gazica, M. W., Leto, G. D., & Irish, A. L. (2022). The effects of unexpected changes to content delivery on student learning outcomes: A psychological contract perspective during the COVID-19 era. *Psychology in the Schools*, 59(8), 1473–1491. <https://doi.org/10.1002/pits.22685>
- [6] Puška, A., Puška, E., Dragić, L., Maksimović, A., & Osmanović, N. (2021). Students' Satisfaction with E-learning Platforms in Bosnia and Herzegovina. *Technology, Knowledge and Learning*, 26(1), 173–191. <https://doi.org/10.1007/s10758-020-09446-6>
- [7] Mahlangu, V. P. (2018). The Good, the Bad, and the Ugly of Distance Learning in Higher Education. In (Ed.), Trends in E-learning. *IntechOpen*. <https://doi.org/10.5772/intechopen.75702>
- [8] Viberg, O., & Grönlund, K. (2015). Understanding students' learning practices: challenges for design and integration of mobile technology into distance education. *Learning, Media and Technology*, 42(3), 357–377. <https://doi.org/10.1080/17439884.2016.1088869>
- [9] Jakšić, A., Mitrović, K., Čurčić, J., Gračanin, D. (2021). Traditional Vs. Online Learning: Advantages And

- Challenges. In V. Katić & B. Kamuš (Eds.), *Zbornik radova* (pp. 181–184). Fakultet tehničkih nauka. <http://www.trend.uns.ac.rs/TREND2021-zbormik-radova.pdf>
- [10] Samriah, S. (2022). Improving Social Science Learning Outcomes through the Application of Problem Solving Learning Methods. *International Journal of Management and Education in Human Development*, 2(01), 001–017. Retrieved from <https://ijmehd.com/index.php/ijmehd/article/view/46>
- [11] Rapanta, C., Botturi, L., Goodyear, P. et al. (2020) Online University Teaching During and After the Covid-19 Crisis: Refocusing Teacher Presence and Learning Activity. *Postdigit Sci Educ* 2, 923–945 (2020). <https://doi.org/10.1007/s42438-020-00155-y>
- [12] Zilka, G. C, Cohen, R, & Rahimi, I. D. (2018). Teacher presence and social presence in virtual and blended courses. *Journal of Information Technology Education: Research*, 17, 103-126. <https://doi.org/10.28945/4061>
- [13] Dyer, T., Aroz, J., & Larson, E. (2018). Proximity In The Online Classroom: Engagement, Relationships, And Personalization. *Journal of Instructional Research*, 7(1). <https://doi.org/10.9743/jir.2018.10>
- [14] Bergdahl, N., & Nouri, J. (2020). Covid-19 and Crisis-Prompted Distance Education in Sweden. *Technology, Knowledge and Learning*. <https://doi.org/10.1007/s10758-020-09470-6>
- [15] Yang, F., & Li, F. W. B. (2018). Study on student performance estimation, student progress analysis, and student potential prediction based on data mining. *Computers & Education*, 123, 97–108. <https://doi.org/10.1016/j.compedu.2018.04.006>
- [16] Kay, R., MacDonald, T., & DiGiuseppe, M. (2018). A comparison of lecture-based, active, and flipped classroom teaching approaches in higher education. *Journal of Computing in Higher Education*. <https://doi.org/10.1007/s12528-018-9197-x>
- [17] Wallace, S., Schuler, M. S., Kaulback, M., Hunt, K., & Baker, M. (2021). Nursing student experiences of remote learning during the COVID-19 pandemic. *Nursing Forum*, 56(3). <https://doi.org/10.1111/nuf.12568>
- [18] Musa, M. A. A., & Momani, J. A. A. (2022). University Students' Attitudes towards using the Nearpod Application in Distance Learning. *Journal of Education and E-Learning Research*, 9(2), 110–118. <https://doi.org/10.20448/jeelr.v9i2.4030>
- [19] Katz, A., & Kedem-Yemini, S. (2021). From classrooms to Zoom rooms: preserving effective communication in distance education. *Journal of Information Technology Case and Application Research*, 23(3), 1–40. <https://doi.org/10.1080/15228053.2021.1922248>
- [20] Chukwuemeka, E. J., Falode, O. C., & Falode, M. E. (2022). COVID-19 Pandemic: A Catalyst to Technology Integration in Teaching for Sustainable Science, Technical and Vocational Education in Nigeria. *European Journal of Interactive Multimedia and Education*, 3(1), e02208. <https://doi.org/10.30935/ejimed/11979>
- [21] Masry-Herzallah, A. (2022). Effectiveness of Online Learning Among Graduate Students: Comparison Between Cultures. *European Journal of Educational Research*, 11(3), 1581–1594. <https://doi.org/10.12973/eu-jer.11.3.1581>
- [22] Blahušíková, M., Mokošová, D., & Šoltés, E. (2021). Education in Online Environment from Students' and Teachers' Perspective. *International Journal of Cognitive Research in Science, Engineering and Education (IJCRSEE)*, 9(2), 203–226. <https://doi.org/10.23947/2334-8496-2021-9-2-203-226>
- [23] Petrila, L., Goudenhooff, G., Gyarmati, B. F., Popescu, F.-A., Simuț, C., & Brihan, A.-C. (2022). Effective Teaching during the COVID-19 Pandemic? Distance Learning and Sustainable Communication in Romania. *Sustainability*, 14(12), 7269. <https://doi.org/10.3390/su14127269>
- [24] Puška, E., Ejubović, A., Đalić, N., & Puška, A. (2021). Examination of influence of e-learning on academic success on the example of Bosnia and Herzegovina. *Education and Information Technologies*, 26(2), 1977–1994. <https://doi.org/10.1007/s10639-020-10343-9>
- [25] Wu, G., Zheng, J., & Zhai, J. (2021). Individualized learning evaluation model based on hybrid teaching. *The International Journal of Electrical Engineering & Education*, 002072092098399. <https://doi.org/10.1177/0020720920983999>
- [26] Singh, J., Steele, K., & Singh, L. (2021). Combining the best of online and face-to-face learning: Hybrid and blended learning approach for COVID-19, post vaccine, & post-pandemic world. *Journal of Educational Technology Systems*, 50(2). <https://doi.org/10.1177/004723952111047865>
- [27] Štilić, A., Puška, E., Puška, A., & Božanić, D. (2023). An Expert-Opinion-Based Evaluation Framework for Sustainable Technology-Enhanced Learning Using Z-Numbers and Fuzzy Logarithm Methodology of Additive Weights. *Sustainability*, 15(16), 12253. MDPI AG. Retrieved from <http://dx.doi.org/10.3390/su151612253>
- [28] Brockman, R. M., Taylor, J. M., Segars, L. W., Selke, V., & Taylor, T. a. H. (2020). Student perceptions of online and in-person microbiology laboratory experiences in undergraduate medical education. *Medical Education Online*, 25(1). <https://doi.org/10.1080/10872981.2019.1710324>
- [29] Vrgović, P., Pekić, J., Mirković, M., Anderla, A., & Leković, B. (2022). Prolonged Emergency Remote Teaching: Sustainable E-Learning or Human Capital Stuck in Online Limbo? *Sustainability*, 14(8), 4584. <https://doi.org/10.3390/su14084584>

- [30] Pearce, M. J., Pargament, K. I., Oxhandler, H. K., Vieten, C., & Wong, S. (2020). Novel online training program improves spiritual competencies in mental health care. *Spirituality in Clinical Practice*, 7(3), 145–161. <https://doi.org/10.1037/scp0000208>
- [31] Li, Z. M., Li, Q., Han, J., & Zhang, Z. (2022). Perspectives of Hybrid Performing Arts Education in the Post-Pandemic Era: An Empirical Study in Hong Kong. *Sustainability*, 14(15), 9194. <https://doi.org/10.3390/su14159194>
- [32] Calamlam, J. M., Ferran, F., & Macabali, L. G. (2021). Perception on research methods course's online environment and self-regulated learning during the COVID-19 pandemic. *E-Learning and Digital Media*, 19(1), 93–119. <https://doi.org/10.1177/20427530211027722>
- [33] Göksu, D., Ergün, N., Özkan, Z., & Sakız, H. (2021). Distance education amid a pandemic: Which psychodemographic variables affect students in higher education? *Journal of Computer Assisted Learning*, 37(6), 1539–1552. <https://doi.org/10.1111/jcal.12544>
- [34] Hamaidi, D. D. A., Arouri, D. Y. M., Noufal, R. K., & Aldrou, I. T. (2021). Parents' Perceptions of Their Children's Experiences With Distance Learning During the COVID-19 Pandemic. *The International Review of Research in Open and Distributed Learning*, 22(2), 224–241. <https://doi.org/10.19173/irrodl.v22i2.5154>
- [35] Kamal, M. I., Zubanova, S., Isaeva, A., & Movchun, V. (2021). RETRACTED ARTICLE: Distance learning impact on the English language teaching during COVID-19. *Education and Information Technologies*, 26(6), 7307–7319. <https://doi.org/10.1007/s10639-021-10588-y>
- [36] Permana, F. H., Sukma, E., & Wahyono, P. (2021). The use of distance learning through whatsapp and google meeting to identify differences in biology learning outcomes. *Biosfer*, 14(1), 86–98. <https://doi.org/10.21009/biosferjpb.20094>
- [37] Rozal, E., Ananda, R., Zb, A., Fauziddin, M., & Sulman, F. (2021). The Effect of Project-Based Learning through YouTube Presentations on English Learning Outcomes in Physics. *AL-ISHLAH: Jurnal Pendidikan*, 13(3), 1924–1933. <https://doi.org/10.35445/alishlah.v13i3.1241>
- [38] Dewi, D. L. K., & Muslikah, M. (2021). The Correlation of Coping Stress and Social Support with Academic Stress on Distance Learning. *Bisma the Journal of Counseling*, 5(2), 121–128. <https://doi.org/10.23887/bisma.v5i2.37631>
- [39] Rizvi, Y. S., & Nabi, A. (2021). Transformation of learning from real to virtual: an exploratory-descriptive analysis of issues and challenges. *Journal of Research in Innovative Teaching & Learning*, 14(1), 5–17. <https://doi.org/10.1108/jrit-10-2020-0052>
- [40] Safa, B. S. S., & Wicaksono, D. (2022). THE IMPLEMENTATION OF SELF-DIRECTED LEARNING STRATEGY IN TEACHING READING NARRATIVE TEXT IN DISTANCE LEARNING DURING COVID-19. *The Social Perspective Journal*, 1(2), 128–139. <https://doi.org/10.53947/tspj.v1i2.84>
- [41] Stosic, L., Dermendzhieva, S., & Tomczyk, L. (2020). Information and communication technologies as a source of education. *World Journal on Educational Technology: Current Issues*, 12(2), 128–135. <https://doi.org/10.18844/wjet.v12i2.4815>
- [42] Štilić, A., Nicić, M., & Njeguš, A. (2022). Global distribution systems versus new distribution capability and Internet of things. *The European Journal of Applied Economics*, 19(1), 81–97. <https://doi.org/10.5937/ejae19-36420>
- [43] Simonović, N. (2021). Teachers' Key Competencies for Innovative Teaching. *International Journal of Cognitive Research in Science, Engineering and Education (IJCRSEE)*, 9(3), 331–345. <https://doi.org/10.23947/2334-8496-2021-9-3-331-345>
- [44] Maksimović, J., Stošić, L., & Tomczyk, L. (2021). Digital Didactical Resources as Innovative Multimedia Methods in the Work of a Modern and Reflective Teacher. *XIV International Scientific Conference "INTERAGROMASH 2021"*, 689–698. [https://doi.org/10.1007/978-3-030-80946-1\\_63](https://doi.org/10.1007/978-3-030-80946-1_63)
- [45] Stanišić, T., Leković, M., & Stošić, L. (2019). Relationship between the quality of higher education and Balkan countries' competitiveness. *International Journal of Cognitive Research in Science Engineering and Education*, 7(3), 49–59. <https://doi.org/10.5937/ijcrsee1903049s>
- [46] Fatih Sapanca, H., Sami Kaya, O., Taşpolat, A., & Tezer, M. (2022). Investigation of Prospective Teachers' Use of Mobile Technologies in Teaching Activities. *International Journal of Cognitive Research in Science, Engineering and Education (IJCRSEE)*, 10(2), 121–132. <https://doi.org/10.23947/2334-8496-2022-10-2-121-132>

#### Article history:

Received 15 October 2023

Accepted 11 December 2023

# FINANCIAL BEHAVIOR AND LITERACY OF STUDENTS IN RUSSIAN HIGHER EDUCATION INSTITUTIONS

ILYASHENKO LUBOV Kiryalovna<sup>1</sup>, LYUSHNENKO MARIA Eldarovna<sup>2</sup>

<sup>1,2</sup>Tyumen Industrial University, Tyumen (RUSSIA)

E-mail: [iljashenkolk@tyuiu.ru](mailto:iljashenkolk@tyuiu.ru); [mari.luysh29@mail.ru](mailto:mari.luysh29@mail.ru)

## ABSTRACT

*The main purpose of this article is to consider the level of financial behavior and financial literacy of students in higher educational institutions. Show what knowledge students have in the field of financial literacy, and how they apply it in real life situations in the modern world, where all types of financial services are actively used. It is also equally important to determine what factors influence the financial behavior of students. Indeed, over the past decades, the financial market, in the context of local wars, armed conflicts, crises, has undergone many changes and innovations. All this has an impact on the social population and requires the study of financial literacy and the formation of financial behavior. All this adds up to a complex financial system. Students already have an understanding of simple financial instruments, but basic knowledge in this area is not enough for a financially independent life. Therefore, it is important to study the financial industry and actively implement this knowledge in everyday life.*

**Keywords:** *financial literacy of students, financial behavior of students, rational behavior and irrational financial behavior of students.*

**JEL:** H30

**DOI:** DOI: 10.5937/intrev2304064I

**UDC:** 37.015.31:336

316.644-057.875:336(470)

**COBISS.SR-ID** 133881097

## INTRODUCTION

Students live and grow up in conditions where responsibility for their own financial well-being lies with the individual. Making reasonable financial decisions, many of which are related to the choice of behavior when solving typical problems in everyday life situations, this is the essence of financial behavior and financial literacy as a person's personal skill, a manifestation of his functional literacy. There is an increasing variety of financial products and services available to young people, making their choices more complex.

Nowadays, financial behavior and financial literacy are important factors for a successful career and achieving financial stability. Higher education students should have sufficient understanding of financial principles and practices to successfully apply them in their lives. The study will help to understand how well students in higher education are aware of financial knowledge.

The financial behavior of students in higher education institutions can be characterized as knowledge and active use of basic financial instruments, principles and rules, i.e. this includes making smart decisions about investments, savings, purchases and other financial actions. The financial behavior of students in higher education institutions also reflects gender and emotional behavior.

Financial behavior of university students is a large and broad concept that includes various types and factors influencing financial behavior, and the main component of which is financial literacy.

The financial behavior of students includes two main types: rational financial behavior - behavior aimed at competent distribution of their finances, allowing for the most profitable use of limited funds. And the irrational financial behavior of students is the incorrect distribution of their finances based on emotional choice and the inability to determine their own benefit.

By financial literacy of students in higher educational institutions, we mean the student's possession of information about financial products; knowledge of existing flows of information and financial advisory services; the ability to use existing information data when solving financial problems: calculations, risks, comparison of financial services for profitability and achieving personal financial well-being [1].

This applies to all main areas, such as:

- rational use of monetary resources for consumption;
- culture of savings in order to form deposits;
- efficient use of financial resources for investment.

## TYPES AND LEVELS OF FINANCIAL BEHAVIOR AND FINANCIAL LITERACY

Everyone has heard the expression: "You're not using your finances wisely" or "You're spending your budget so wisely." Most often, there are two types of financial behavior: rational and irrational behavior.

Rational behavior of students is behavior aimed at acquiring the most useful set of goods to satisfy needs with a limited amount of money (i.e., to maximize utility from the use of limited funds).

In order to form the most useful set of goods, the student: forms various combinations of goods that he can purchase with the money he has; compares the utility of these combinations (which combination will satisfy more of his needs and more fully); looks for alternative products with similar qualities [2].

Irrational behavior of students is an incorrect decision made to purchase specific goods or services, characterized by unreasonableness, inappropriateness of choice (emotional choice), lack of taking into account their own benefits, and compiling them with costs.

The main signs of this behavior are:

- lack of preliminary analysis of the actions taken;
- lack of assessment of one's financial capabilities;
- belief in achieving positive results without understanding the methods and means that are necessary for this, as well as assessing the real consequences of making a particular decision [3].

There is no specific classification of financial behavior of university students, but most often financial behavior is divided into levels: 0, 1, 2, 3 levels.

Level 0 – no or minimal understanding of financial behavior and financial literacy;

Level 1: basic understanding of financial literacy (economic policies, financial markets and financial instruments) and the ability to use them.

Level 2: use of basic investment tools - investment strategies, deposit management and risk.

Level 3: full use of all financial instruments and understanding of the patterns of monetary relations between citizens, the state, transnational associations in the process of reproduction, stimulation and satisfaction of certain needs of both society as a whole and individual member [4].

## TENDENCY OF STUDENTS TO DEVIANT FINANCIAL BEHAVIOR

The financial behavior of students depends on many factors, such as: age, gender, financial situation and financial independence of university students.

The age factor has a great influence on the financial behavior of students. Young people (students aged 18 to 25) who are in the process of developing their financial literacy are more likely to be wasteful and underestimate the long-term consequences of their financial decisions. They are characterized by impulsive purchases, inability to plan their budget, and lack of savings. Students between the ages of 25 and 30 try to preserve and increase their finances by regularly conducting risk analysis and comparing the financial market, they choose the best ways to invest their money, and wisely approach the distribution of their budget.

Gender differences in financial behavior are determined by savings motives and financial literacy among boys and girls. It has always been believed that men have higher levels of financial literacy and exhibit long-term financial behavior than girls. Men are knowledgeable about investing and saving, and they also tend to keep stricter records of income and expenses, while trying to invest and grow their finances to improve their standard of living. Girls have a lower level of financial literacy, this is due to a lack of awareness in the field of finance and a tendency to waste; they have a general idea of current income and expenses, and the practice of keeping clear records of these amounts is much less common [5]. But the study showed that 40% of girls, along with men, are active financially; they also have deposits and assets. This indicates that in the modern world, girls are increasingly interested in financial activities and try to keep up with men.

By deviant behavior we mean, on the one hand, an act, a person's actions, that do not correspond to officially established or actually established norms or standards in a given society. On the other hand, as a social phenomenon expressed in mass forms of human activity that do not correspond to officially established or actually established norms or standards in a given society.

During the study, conducted in 2022, respondents were asked four questions aimed at identifying an individual's attitudes regarding deviations in personal financial behavior. In these questions, students had to express their attitude towards receiving a salary "in an envelope", engaging in entrepreneurial activity without registering the status of an individual entrepreneur, informal "gratitude" for some services and understating the cost of an apartment when selling in order to reduce taxes. Almost 20% of respondents reported that they would agree to receive part of their salary unofficially ("in an envelope"), and 43.8% would potentially agree if the amount suits them. 13.4% of respondents supported the hypothetical decision of friends not to register as an entrepreneur; only 6% of students expressed clear disagreement with such actions. They noted that 14.6% of respondents would agree to lower the price of an apartment when selling, fully understanding that such actions of the seller are aimed at reducing their taxes, and only 20% will feel that they are trying to be dragged into something illegal. 16% of respondents agreed to thank in cash for the service provided, another 43% agreed, provided that this gratitude was deserved, 20.3% were categorically against this.

They also note that 34% of respondents had a positive attitude towards a deliberate violation of the law in only one hypothetical situation out of the four proposed (of which 32% agreed only with the situation associated with unofficial remuneration, 24% with unofficial gratitude, 26% with lowering the price of the apartment). Another 10% expressed their agreement on any two situations, and 3% - on three. There were no students in the sample who agreed with the possibility of participating in illegal actions in all four situations. It can be assumed that if an individual in at least 50% of situations is fairly loyal to a deliberate violation of the law, then this can be considered a manifestation of a tendency to deviate in financial behavior. Thus, the share of respondents showing a tendency towards deviant financial behavior was 12.9%.

The study identified a relationship between an individual's propensity for financial risk and his exposure to the risks of involvement in illegal financial schemes. To assess risk appetite, a question was used based on the "classical" understanding of an individual's propensity/aversion to financial risk, based on the von Neumann–Morgenstern utility theory. It is believed that if an individual is offered the choice of participating in a game (lottery) with some winnings and losses, and receiving a guaranteed amount equal to the average winnings in the game (lottery), then the risk-prone individual is more likely to prefer the game.

Thus, the largest number of respondents (52%) turned out to be risk-averse (they chose to receive a guaranteed income), another 23% - risk-prone (decided to participate in the lottery), 26% - indifferent or neutral in relation to risk.

Attitude to risk is a fairly significant factor that determines an individual's financial behavior strategies. However, the propensity to become involved in illicit financial schemes is a complex characteristic that can be influenced by a number of other factors. Based on the grouping (by propensity for deviant financial behavior), the main characteristics of students susceptible to involvement in illegal financial schemes were identified. There are two types of characteristics: general and personal finance. General characteristics: floor; nationality; age; study area group; number of family members; the locality in which they lived before entering the university. Personal Finance: Employment; services of microfinance organizations; average monthly family income; personal expenses; assessment of personal financial situation; a situation when the money has already run out and you need to wait a few more days until a scholarship or salary.

According to the results of the study, about 13% of respondents can be characterized as prone to deviant financial behavior. A statistically significant relationship was found between the propensity to get involved in illegal financial schemes and attitude towards risk. Also, based on the grouping carried out, the following profiles of students' propensity to deviate financial behavior were identified:

1) general characteristics – young men; living before entering a university in regional cities with a population of over 100 thousand people, studying in humanitarian and social fields;

2) characteristics of personal finance and financial behavior:

- working students; using the services of microfinance organizations;
- students with a higher (compared to those not prone to deviations) level of family income and expenses for personal needs;
- students assessing their financial situation as either very poor or above average;
- students who face problems of lack of money before a scholarship/salary quite often or never face them [6].

The conducted research indicates a fairly high propensity of young people to engage in deviant financial behavior. High tolerance for violations of public and legislative norms regarding finance can provoke an increase in phenomena such as corruption, informal employment, undeclared income, etc. On the other hand, it is necessary to understand that tolerance to such phenomena is determined by the current economic situation, and in order to change the attitude of the population, especially the younger part, to financial deviations, measures should be implemented that influence the factors causing it [7].

## **INFLUENCE ON THE FINANCIAL BEHAVIOR OF STUDENTS BY THEIR FINANCIAL SITUATION AND FINANCIAL INDEPENDENCE**

Based on the data of the author's sociological survey conducted in the fall of 2022 on the topic: "Specifics of the economic behavior of student youth," in which 1242 students of various undergraduate and graduate courses in the humanities and technical fields from 17 universities in Russia took part.

Based on the results of this study, sources of income for students were identified. These sources include: parental support, scholarships, part-time jobs, full-time jobs, income from web content, research grants. The vast majority of respondents are supported by their parents (1st place); on 2nd place among sources of income are scholarships and part-time jobs; on 3rd place is wages. A small proportion of students receive money through creative, intellectual work - through scientific work or the implementation of their skills on the Internet.

The survey revealed that more than half of the respondents (61%) live with their parents. The average age of respondents who indicated that they lived with their parents was 18.3 years. The average age of respondents living separately from their parents is 19.5 years.

Also in this study, it was concluded that the amounts that can be considered savings for students were underestimated: the value of the level of savings that respondents are targeting or already own turned out to be less than the average level of wages of young workers. Considering the age of the respondents, and the fact that 88.5% of them are supported in one way or another by their parents, it is worth understanding that in case of financial problems, children will turn to their parents for help. This assumption was confirmed by the survey. To the question: "If you feel an urgent need to purchase anything, how will you look for funds to buy it," a significant portion of respondents are ready to turn to their parents for help [8]. The amounts that respondents mean, which are provided by parents, by savings may not be enough even for urgent needs.

The more financially independent and self-sufficient the respondents are, the more rational an approach they take to questions about the amount of savings they take. The savings levels chosen by this group of respondents who lead an independent lifestyle exceed the average monthly salary, which indicates that they have or are trying to have a financial cushion in order to have the opportunity for financial maneuvers. Analysis of this part of the survey results shows the importance of an independent lifestyle in financial matters. Skills in planning savings and savings come with experience in independent financial management. The results obtained allow us to conclude that students who are financially independent from their parents demonstrate investment skills and use complex financial instruments associated with speculation on stock and currency exchanges [9].

The last block of questions analyzed the correspondence of consumer preferences to the financial capabilities of students, and the degree of satisfaction of young people with the implementation of their life plans. An analysis of the answers to this set of questions demonstrates that a significant component of the lifestyle of student youth is the acquisition of such necessary goods as medical services, cosmetics, household and digital equipment. To assess the level of security of student representatives, self-assessment of their financial situation was considered [10]. As a result of the analysis, a discrepancy between consumer preferences and the financial capabilities of students was revealed. Some of the purchases and services are freely available to the majority of respondents - buying printed books, visiting theaters, purchasing digital subscriptions, visiting clubs/discos, but respondents do not give them preference. The opposite situation is shown by a high desire to receive additional education and buy a car, which is difficult for students to access.

The analysis of financial behavior among financially independent and parent-dependent groups of students showed differences in approaches to saving and investment behavior. A discrepancy between consumer preferences and financial capabilities was identified, which allows us to draw a conclusion about the social vulnerability of the younger generation [11, 12]. And also about the influence on financial behavior not only of personal characteristics or external factors, such as the institutional environment, but also of the influence of family, parents, who project onto the individual the commonality of their attitudes and views, which do not always turn out to be rational. Thus, the more financially independent an individual is, the more rational his financial behavior is, which manifests itself in an understanding of the required minimum amounts for the formation of his financial savings and a propensity for investment behavior.

## CONCLUSIONS

Financial behavior and financial literacy of students in higher education institutions depend on many factors, the main one of which is independent lifestyle. Students living with their parents have less knowledge in the field of financial literacy, deposits and investments, in contrast to students leading an independent lifestyle.

It is worth noting that young people, due to their behavioral characteristics (mobility and sensitivity), quickly master liberal market values, which consist, first of all, in approving the ideals of "mass consumerism", perhaps even to the detriment of the development of their own economic and civic activity. The consumer orientations of young people have already been formed, this is beyond doubt. However, they are not supported by the skills of competent financial behavior and rational consumption, which cannot but worry, since young people will "carry" their consumer attitudes and the resulting high credit and low savings and investment activity throughout their lives and will also influence the formation of behavioral stereotypes their children.

## REFERENCES

- [1] Rutkovskaya, E. L. (2019). Financial literacy as a component of functional literacy: approaches to the development of educational tasks. *Domestic and foreign pedagogy*, 1(4 (61)), 98-111.
- [2] Economics. – Text: electronic // Rational economic behavior. – URL: [https://reshutest.ru/theory/10?theory\\_id=158](https://reshutest.ru/theory/10?theory_id=158).
- [3] Features of the demand of an irrational consumer and the boundaries of its measurement. – Text: electronic // Irrational consumption. – URL: [https://spravochnick.ru/mikro-\\_makroekonomika/osobennosti\\_sprosa\\_neracionalnogo\\_povedeniya\\_potrebitelya\\_i\\_granicy\\_ego\\_izmere\\_niya/](https://spravochnick.ru/mikro-_makroekonomika/osobennosti_sprosa_neracionalnogo_povedeniya_potrebitelya_i_granicy_ego_izmere_niya/).
- [4] Kosmacheva, N. M., & Busheneva, Yu. I. (2018). Formation of financial literacy of students in the context of a competency-based approach to learning. *Bulletin of Leningrad State University named after. AS Pushkin*, (4), 321-332.
- [5] Yurganova, I. I., Nikolaeva, I. V., & Ivanov, N. Yu. (2019). Study of modern trends in financial literacy of students in the Republic of Sakha (Yakutia). *Business. Education. Law*, (4), 87-93.
- [6] Rogachev, D. Yu. (2021). Features of financial behavior of student youth. *Population*, 24(2), 41-52.
- [7] Nivorozhkina L. I., Sinyavskaya T. G., Tregubova A. A. Statistical study of the propensity of youth to deviant financial behavior // *Intellect. Innovation. Investments*. – 2019. – No. 5. – pp. 109-119.
- [8] Lavrenova E. B. Conceptual approaches to the formation of a culture of competent financial behavior of students in educational institutions // *Domestic and foreign pedagogy*. – 2017. – T. 1. – No. 2 (37). – P. 8-21.
- [9] Strebkov D. et al. Main types and factors of credit behavior of the population in modern Russia // *Issues of Economics*. – 2004. – T. 2. – P. 109-128.
- [10] Alieva I. A. Financial behavior of the population: theoretical aspect // *Bulletin of the Kyrgyz-Russian Slavic University*. – 2016. – T. 16. – No. 2. – pp. 107-109.
- [11] Korol K.N. Credit behavior of modern youth of Russia // *Bulletin of the Saratov State Socio-Economic University*. – 2018. – No. 1 (70). – pp. 144-146.
- [12] Voskanyan, R. O. (2018). Financial literacy as a condition for the formation of financial culture. *Azimuth of Scientific Research: Economics and Management*, 7(1 (22)), 86-88.

### Article history:

Received 5 November 2023

Accepted 14 December 2023

# RESEARCH ON THE LEVEL OF FINANCIAL LITERACY OF STUDENTS: THE CASE OF MOSCOW POLYTECHNIC UNIVERSITY

**PANOVA Elena<sup>1</sup>, VASLAVSKAYA Irina<sup>2</sup>, BASHKIROVA Kristina<sup>3</sup>, FROLOVA Natalia<sup>4</sup>, SEMIKIN Dmitriy<sup>5</sup>, SEMIKINA Yulia<sup>6</sup>**

<sup>1,3,4</sup>Moscow Polytechnic University, Moscow (RUSSIA)

<sup>2</sup>Kazan Federal University, Naberezhnye Chelny Institute, Russian Federation. Department of Economics of enterprises and organizations, Higher School of Economics and rights, Kazan Federal University, Kazan (RUSSIAN FEDERATION)

<sup>5,6</sup>Volgograd Institute of Management (branch), Russian Presidential Academy of National Economy and Public Administration, Volgograd (RUSSIA)

E-mail: panova\_ep@mail.ru; vaslavskaya@yandex.ru; 79263539152@yandex.ru; semikindv@yandex.ru; semikinajulia@yandex.ru

## ABSTRACT

*The article examines and compares the level of financial literacy of 1st, 2nd and 4th year students at the Biochemical Faculty of Moscow Polytechnic University. The article describes a study conducted on the following topic: to what extent young people are ready for independent life at the beginning of their university course and on graduation from the university, and how exactly the level of financial literacy changes during the period of study. A survey has been conducted among students reflecting the degree of family involvement in the financial education of the child. The issue of the need to introduce financial education issues into the university education system in the section of the discipline "Economics" has been discussed.*

**Keywords:** Financial Literacy, Budget, Planning, Youth.

**JEL:** H30

**DOI:** 10.5937/intrev2304070P

**UDC:** 316.644-057.875:336(470)

**COBISS.SR-ID** 133884169

## INTRODUCTION

Financial literacy is a set of knowledge and skills in the field of a person's financial behavior, providing him with well-being and a stable life. It is an integral part of every person's life; it affects all areas of his life and directly affects its quality. That is why, in order to ensure a stable and prosperous life, you need to be financially literate. A person knowledgeable in the field of finance, who is able to competently manage his income, correctly draw up and plan a budget, choose the most promising ways to invest his funds, while reducing risks to a minimum, chooses a winning position. In this case, the likelihood of problems such as bankruptcy, vulnerability to financial fraudsters, debts, thoughtless purchases, etc., tends to be eliminated. In addition, the level of financial literacy of a country's population determines its well-being and further development. However, it can be argued that at the moment in Russia it is very low, and that is why our state needs to find ways to solve and eradicate this problem. A. Chaplinskaya writes: "A financially literate person not only has knowledge about financial products, but also the skills necessary for him to make appropriate decisions when choosing financial products, and can also they can rationally plan a personal budget and save funds in case of emergencies" [1].

It is no secret that basic knowledge in this area is established in the family by involving a child, at a conscious age, in discussing the family budget, providing the opportunity to make independent purchases and plan their expenses [2]. However, when beginning an independent life, one way or another, teenagers become vulnerable. They, being financially independent, are at great risk of making rash purchases or being deceived due to lack of awareness in the field of finance, credit, savings and planning. Therefore, it is necessary to impart the skills and abilities of capital management to the younger generation, give them knowledge that will later help them avoid mistakes and losses in adult life, form the right guidelines in the field of finance and ensure security [3].

## METHODS

At the Moscow Polytechnic University at the Faculty of Biotechnology, it was decided to conduct a survey in the form of testing to determine the level of financial literacy among 1st-2nd and 4th-year students. The survey involved 129 full-time 1st-2nd year students and 31 4th year students. At the beginning of their studies, students were just getting acquainted with independent life, taking the first steps towards creating and managing a personal budget. They faced difficulties, were somewhat ignorant in some financial aspects, made mistakes and learned from their mistakes. However, how did their level of financial literacy change at the end of their studies? How exactly did living on your own affect them?

The purpose of this article is to answer the questions asked, compare survey results and find out how much students studying at a faculty where there are no financial disciplines have increased or decreased their level in matters of lending, budget planning and financial management.

To achieve the goal, the following research questions were posed:

- Find out whether financial literacy skills were taught in the family? Were the students prepared for independent life in Moscow?
- To what extent do students have theoretical knowledge in the field of financial literacy?
- What opportunities do students use to manage finances wisely?

Empirical basis of the study

The study involved 129 people from the Moscow Polytechnic University, Faculty of Chemical Technologies and Biotechnology, they were 1st and 2nd year students and 31 4th year students.

Data collection was carried out empirically in the form of an anonymous correspondence survey through the Google forms platform using a standardized questionnaire form. After posting the survey in Google forms, the students were sent a link through which each of them completed an individual, anonymous survey. The respondents were mainly offered questions with the possibility of choosing an answer (multiple or limited); the questions were of a closed form.

The teacher did not influence the student's answer, that is, the students completed the survey independently. The questionnaire questions were grouped into three blocks: the first block consisted of 15 questions that clarified sociocultural information: the region the student came from, the university, learning programs, as well as the ways to involve the student in the distribution of the family's budget. The purpose of the questions in the second block is to identify the level of financial literacy of the students (16 questions).

The third block of questions includes questions that identify the opportunities that students use in the process of distributing their budget funds, the way they use their knowledge in practice (10 questions). Quantitative data processing was carried out using standard mathematical and statistical methods of analysis. Primary information was processed using Microsoft Excel.

When surveying students, we took into account the criteria that had been previously identified in the studies of other scientists, such as Navruzova Madina Elkhan Kyzy: “the main type of income of young people, where finances are mainly spent, if young people keep records of their own expenses and income, if they plan finances, whether there are special programs in schools that help manage finances more rationally, whether young people invest in securities, how education is conducted”[4].

Students who study at the Moscow Polytechnic University come from different regions of Russia. The survey showed that students of the Faculty of Biotechnology come not only from Moscow and the Moscow region, but also from Novosibirsk, Chukotka, Chelyabinsk, Tula, Volgograd, Stavropol, Yaroslavl, Kazan, as well as from the autonomous republics: Mordovia, Tatarstan and others. They were cut off from their usual life, plunged into the world completely unfamiliar to them before, they found themselves in a new status, the status of students. The undergraduates were just starting their independent lives, learning to manage their finances, save their money, and earn money on their own to provide for their lives.

## RESULTS

Table 2 presents the results of the survey of the students of years 1-2 and 4, which relate to the first block of the questionnaire. In this part of the survey, an attempt is made to find out how seriously parents in the families of modern youth deal with issues of financial literacy and how such upbringing influences the child’s life in the future. “Since youth are the most receptive segment of the population to learn, financial literacy education for this age group will bring the greatest results, speaking strategically, in the future. As children from different segments of the population attend schools and universities, this approach will make it possible to reach all social groups. Improving the financial culture of the younger generation will lay the foundation for a stable and prosperous life for the future generation, having the most long-term effect. In fact, in childhood one can lay incentives for studying financial culture and lifelong self-development” (Stepnova and Starchikova, 2021, p. 176). It is known that the foundations of financial literacy are formed in the family, at school age. That is why it was decided to conduct a survey among students about financial behavior in the respondents’ families. The extent to which parents were involved in developing financial literacy was demonstrated by the survey shown in the table.

*Table 1. Results of developing financial literacy in the family*

Questions	Yes		Sometimes		Often		No	
	1-2	4	1-2	4	1-2	4	1-2	4
Year	1-2	4	1-2	4	1-2	4	1-2	4
Did your family teach you how to save money?	50%	25,8%	37,5%	38,7%	0%	12,9%	12,5%	12,9%
Did your parents support your wish to earn money?	62,5%	39,7%	6,3%	19,4%	16%	25,8%	25%	15,1%
Did your parents reward you with extra pocket money for good performance or deprive you for poor performance?	12,5%	12,9%	12,5%	19,4%	6,2%	12,9%	68,8%	51,6%
Were you taught in your family?	43,8%	22,6%	6,3 %	51,6%	6,3%	12,9%	43,8%	9,7%
Did your family discuss the prices and quality of goods with you and involve you in planning purchases?	31,3%	35,5%	18,5%	19,4%	18,8%	25,8%	31,3%	9,7%
Were you involved in discussions about the family budget?	41 %	22,6%	25 %	25,8%	9 %	12,6%	25 %	32,3%

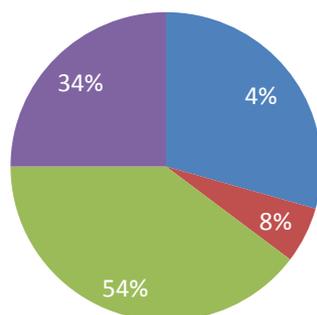
A fairly large percentage of the respondents answered affirmatively that they were involved in discussing the family budget, every second respondent answered that in the family they were taught in one way or another to save money, the desire to earn money on their own was encouraged (62% - 1st and 2nd year; 40% - 4th year). Students (31% and 35%) were involved in discussing the quality of goods, but savings were taught to a greater extent to 1st and 2nd year students (43.8%). However, 68.8% of 1st and 2nd year students and 51.6% of 4th year students responded that their studies were not motivated by money in any way, students understood the degree of responsibility for their studies independently, and no additional funding was required. We should add that, however, a quarter of those surveyed responded that they were not involved in discussing the family budget, and a third responded that they did not discuss the quality of goods and shopping planning with their parents. And half of junior students responded that they had never been taught how to save money. A quarter of the respondents did not have the opportunity to work or earn extra money, since the child's tasks included education. The vast majority of them are girls. It is their parents who motivate them more to study and encourage them to help people. Boys are more independent; they are taught more about economic literacy in the family.

In this regard, we can summarize that the main problem in the field of financial literacy among students is the lack of discussion of this issue in the family, parents do not always pay sufficient attention to this subject in the process of education. Apparently, they mainly hope that the child will independently learn to handle his or her money wisely and will be able to properly distribute his or her budget when they enter adulthood.

The next three questions were focused on studying the current state of financial literacy among young people studying at the Moscow Polytechnic University. To the question: "Living in Moscow and studying at the Moscow Polytechnic University, where do you get your income from?", the students were offered the following answers to choose from: part-time work, hour jobs, scholarship, financial assistance from parents, relatives, close friends, earnings from their main work place, investment, no personal income.

Among 1st and 2nd year students, 8% answered that they work part-time, 54% answered that they live on a scholarship, 34% rely on financial assistance from parents and relatives, and 4% receive earnings from their place of work. However, this picture changes among 4th year students. They begin to actively earn extra money (30%) and earn money at their full-time work (12%), which suggests that they have no choice but to combine study and work to ensure their well-being. They become more independent and are able to find the means for a prosperous life on their own.

Living in Moscow and studying at Moscow Polytechnic University do you get any income?



Part-time work 13%, 8%

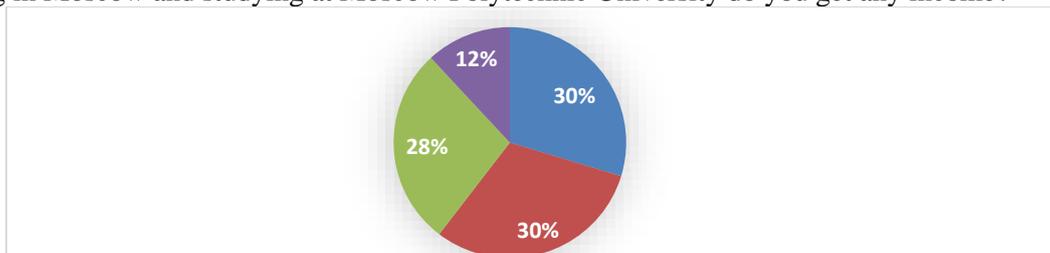
Financial help 56,30%; 34%

Financial help 87, 50%, 54%

Part-time work Scholarship Financial help Earnings at full-time work

**Figure 1.** Source of income for 1st and 2nd year students.

Living in Moscow and studying at Moscow Polytechnic University do you get any income?

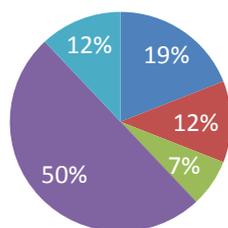


Earnings at full-time work 12,00%, 12%  
 Financial help 28,00%, 28%  
 Part-time work 30%, 30%  
 Scholarship 31%, 30%

**Figure 2.** Source of income for 4th year students

It was also suggested to answer the following question: do you have enough cash income at present? (Yes, it is enough, no, it is not enough, I am in poverty, it is enough thanks to the help of parents, relatives, it is enough thanks to part-time jobs). Junior year students mostly answered that they have enough money thanks to the financial assistance of parents and adults (69%), and only 12.50% work part-time in their free time to be able to study in Moscow, 7.20% answered that they are in poverty, or 12.50% write that they don't have not enough money. In contrast, the main role in ensuring financial stability for senior students is played not only by the support of loved ones, but also by independent income (19%).

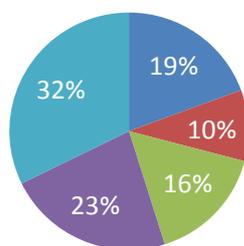
Do you have enough income at present?



The income is enough 50%; 50%  
 The income is enough thanks to the financial assistance 18,80%; 19%  
 The income is enough thanks to per-time jobs 12,50%; 12%  
 The income is not enough 12,50%; 12%  
 In poverty 7,20%; 7%

**Figure 3.** Level of well-being of 1st-2nd year students.

Do you have enough income at present?



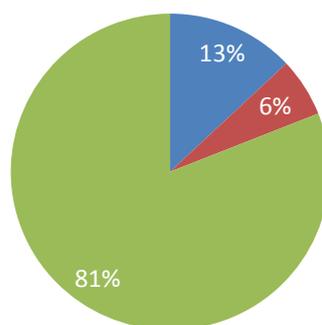
The income is enough thanks to the financial assistance 32,30%; 32%  
 The income is enough 23%; 23%  
 The income is enough thanks to per-time jobs 19,40 %; 19%  
 The income is not enough 16,10%; 16%  
 In poverty 9,70%; 10%

**Figure 4.** Level of well-being of 4th year students.

“You spend your money on...?” The respondents were asked to give answers of the following nature: “Money is spent on buying food, on entertainment (travel, theaters, cinema, museums, cafes, etc.), on buying a car, on buying an apartment.

Junior students say that a large portion of their income is spent on food purchases (81%), while senior students split their expenses evenly. They try not to restrict themselves in terms of entertainment and buying clothes (35% and 28%, respectively). Which suggests that with the increase of years, a person’s priority is given to appearance and pastime, as requirements change and become wider in range. While 1<sup>st</sup> and 2<sup>nd</sup> year students, in turn, cannot afford durable goods or entertainment, only food and clothing, that is, only necessary goods.

You spend money on



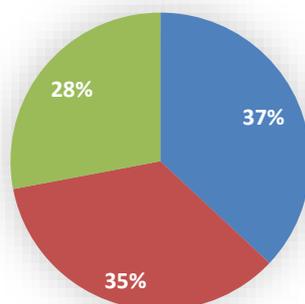
Buying clothes 6,20%; 6%

Buying food 81,30%; 81%

Other things 12,50%; 13%

**Figure 5.** How the funds of 1st and 2nd year students are spent

You spend money on



Buying clothes 28,00%; 28%

Buying food 37,00%; 37%

Other things 35,00%; 35%

**Figure 6.** How the funds of 4th year students are spent

Table 2 examines the extent to which students understand lending and investment issues. A. Chaplinskaya: “With regard to financial planning, there is a particularly important question answering which the respondents must indicate how often they carry out certain financial planning activities: /.../ investing in a pension fund; bank loan; lending money to relatives, friends, acquaintances; borrowing money from relatives, friends, acquaintances” [1].

**Table 2.** Study of the level of financial literacy of students in the field of lending, investments, and the ability to use bank cards

Question	Answer 1	Answer 2	Answer 3	Answer 4
When choosing a bank, first of all you need to pay attention to	Availability of a license issued by the Bank of Russian Federation years 1-2 (87,1%) year 4 (77,4%)	Its rating and reviews on the Internet years 1-2 (9,7%) year 4 (19,4%)	The age of the bank years 1-2 (0%) year 4 (0%)	Bank versatility years 1-2 (3,2%) year 4 (3,2%)
A pledge of real estate is	Mortgage years 1-2 (61,3%) year 4 (51,6%)	Housing tax years 1-2 (35,5%) year 4 (25,8%)	Construction tax years 1-2 (0%) year 4 (19,4%)	Mixed installments years 1-2 (3,2%) year 4 (3,2%)
The highest rate	1,5% per day years 1-2 (54,8%) year 4 (70%)	1,5% per month years 1-2 (38,7%) year 4 (16,7%)	25% per half a month years 1-2 (3,2%) year 4 (6,6%)	50% a year years 1-2 (3,2%) year 4 (6,6%)
If you have taken out a loan from a bank and it went bankrupt, then...	In court, you can demand that your loan agreement be declared invalid years 1-2 (62,1%) year 4 (48,4%)	Your loan will be covered by the deposit insurance agency years 1-2 (25,7%) year 4 (16,1%)	You may no longer repay the loan years 1-2 (12,2%) year 4 (0%)	Must repay the loan to the organization specifies by the bank administration years 1-2 (0%) year 4 (35,5%)
What financial documents are the safest?	Federal loan bonds years 1-2 (58,1%) year 4 (45,2%)	Shares years 1-2 (12,9%) year 4 (25,8%)	Stocks years 1-2 (29%) year 4 (29%)	Futures years 1-2 (0%) year 4 (0%)
What type of loan is overdraft?	Short-term years 1-2 (53,3%) year 4 (16,1%)	Consumer years 1-2 (6,7%) year 4 (35,5%)	Car loan years 1-2 (10%) year 4 (19,4%)	Payday loan years 1-2 (30%) year 4 (29%)
What is an annuity payment?	This is a type of payment in which you transfer the same amount to the bank every month years 1-2 (53,3%) year 4 (16,1%)	This is a loan repayment system in which the borrower makes different monthly payments, the amount of which decreases each time years 1-2 (43,3%) year 4 (19,3%)	Overdue loan years 1-2 (3,4%) year 4 (9,7%)	—
Do you use bank cards?	Yes years 1-2 (97%) year 4 (100%)	No years 1-2 (3%) year 4 (0%)	—	—

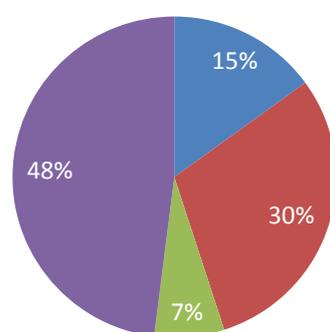
1st and 2nd year students showed a fairly good result in a survey regarding knowledge in the field of mortgage lending (61%), but at the same time they do not understand at all what an annuity payment is (53.3%), in which the borrower makes equal monthly payments, they are unaware of the essence of bank lending (62%) and short-term lending by banks (53.3). They have little understanding of investments and the types of securities on the Russian stock exchange (58.1%), stocks (12.9%), securities (29%), futures (0%). That is, the majority of the respondents did not have that information during the study. The study showed a high degree of use of bank cards to carry out various transactions for the purchase of goods and services (97% of respondents); a high percentage understands mortgage lending issues.

However, the situation changes among 4th year students. During the period of education, they did not acquire new knowledge in the field of finance, thanks to complete autonomy, but lost it. This is evidenced by the results of the survey, and specifically they became less well versed in the field of bank lending (48%), mortgage lending (51%), short-term lending by banks (16%) and the types of securities on the Russian stock exchange (45.2%). However, they became knowledgeable, probably through experience, about bank rates (70%) and the concept of annuity payment (71%).

This situation indicates that as they move away from their school years and the school curriculum, which included at least a small part of financial literacy, students forget everything they knew before. As it is no longer needed, this information disappears and is replaced by another.

We should take into account the answers below. The question “How do you save money?” helps to identify the main vector in the formation of financial planning strategies. Mainly young people are concerned about such issues as medium-term and short-term planning. 1st and 2nd year students tend to live at this age one day at a time; they mainly rely on part-time work and the help of their parents (30% prefer to keep money in cash, 15% do not save money). During this period, students are focused on studying, although some students still state strategies for preserving, accumulating and protecting their funds (48% prefer to store in banks, 7% prefer to buy apartments). This category can be classified as a medium-term financial budget planning strategy. The situation does not change over time and even in the 4th year students think in a similar way.

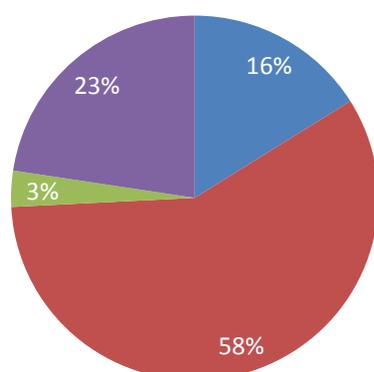
Cash savings  
Bank account  
Buying real estates  
Not to save



The way: not to save 4%, 15%  
The way: buying real estates 2%; 8%  
The way: cash savings 7%; 27%  
The way: Bank account 13%; 50%

**Figure 7.** How do you save money, years 1-2

Cash savings  
Bank account  
Buying real estates  
Not to save

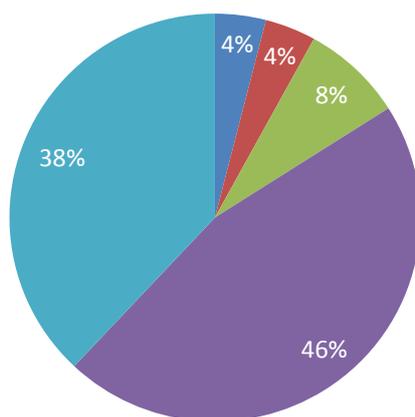


The way: not to save 22,60%, 23%  
The way: buying real estates 3,20%; 3%  
The way: cash savings 16,10%; 16%  
The way: Bank account 58,10%; 58%

**Figure 8.** How do you save money, year 4

The study showed that it is impossible to disagree with scientists O.V. Stepnova, I.Yu. Starchikova[10], who state the following: “As a result of the analysis of the works, the authors came closer to understanding that today in the university environment of technical universities there is an urgent need to expand the scope of the discipline “Economics.” In a technical university, this can be done by introducing a new independent section “Fundamentals of Financial Literacy” [5].

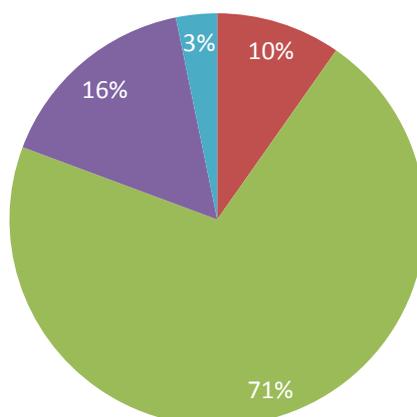
- Low
- Below average
- Average
- Above average
- High



- Level: low 2%; 8%
- Level: below average 12%; 46%
- Level: average 10%; 38%
- Level: above average 1%; 4%
- Level: high 1%; 4%

**Figure 9.** Assessing your own level of financial literacy, 1st and 2nd year.

- Low
- Below average
- Average
- Above average
- High



- Level: below average 9,7%; 10%
- Level: average 71%; 71%
- Level: above average 16,1%; 16%
- Level: high 3,2%; 3%

**Figure 10.** Assessing your own level of financial literacy, 4th year.

## DISCUSSION AND CONCLUSION

However, the students themselves rated their level of financial literacy mainly as average (38%) or below average (46%). Young people are focused on further learning financial literacy.

Despite the fact that parents in families did not always provide sufficient training in developing financial literacy, currently students learn many these skills on their own, which suggests that these respondents are motivated to achieve sustainable financial well-being in the future. The same cannot be said about senior students, who are more confident in their knowledge and rate their level as average (71%) and above average (16%). However, their self-confidence was not justified.

It is worth saying that in the absence of practice and acquisition of knowledge in this area, students completely lose their skills in the field of financial literacy [6][7]. It turns out that graduates who educate in areas not related to finance are completely deprived of knowledge in this area. They become even more vulnerable and financially illiterate, which is a huge problem, since this phenomenon is cyclical and will be reflected in subsequent generations. That is why, it is necessary to introduce an additional educational course in financial literacy in various areas of training, since this discipline will help young people become less vulnerable in adulthood.

In conclusion, it is important to quote the words of the researcher S.A. Bondareva [8]: "In a situation like this, a lack of understanding and practical skills in managing personal finances, including consumption, saving, planning and lending, can lead to rash decisions and rash actions that will have to be paid off for many years throughout life. Therefore, it is important to develop a timely understanding of what money is, how and what it can be used for, what role savings play in achieving financial stability, how you can optimize and balance your income and expenses, what should be taken into consideration when using a loan, how to minimize financial risks and apply financial instruments to increase well-being" [9].

Improvement of financial education among young people is urgent. Firstly, young people are more receptive to training programs. At this age people learn everything at school, at university, at college. And you can simply implement a financial literacy program into the learning process. Secondly, the implementation of this program will cover a large number of different segments of the population since children from different social strata are educated in schools, colleges and universities. And thirdly, today's youth are our future. And their financial education will lead to an improvement in the state's economy.

## REFERENCES

- [1] Kharuk T.V., & Kostina O.I. (2020). Financial literacy is a life skill necessary for young people in the 21st century, pp. 171-176.
- [2] Yemelyanov, V., Nedelkin, A., Yemelyanova, N. (2020). Expert System Software for Assessing the Technical Condition of Critical Lined Equipment. *Advances in Intelligent Systems and Computing*, DOI:10.1007/978-3-030-37916-2\_92
- [3] Korableva, O. N., Gorelov, N., & Kalimullina, O. (2020). Contemporary issues of intellectual capital: Bibliographic analysis doi:10.1007/978-3-030-48021-9\_51
- [4] Maksimova E.I., & Chugunova E.S. (2020). Practical approaches to the study of financial literacy of students. pp. 83-86
- [5] Novruzova M.E. (2022). Financial literacy in Russia and abroad. pp. 70-74.
- [6] Pogosyan, V. (2021a). Updating social theory: Redefinition of modernization. *Wisdom*, 19(3), 182-193. doi:10.24234/WISDOM.V19I3.486
- [7] Pogosyan, V. G. (2021b). Problem of innovations diffusion: A historical retrospective. *Voprosy Istorii*, 2021(5-2), 24-32. doi:10.31166/VoprosyIstorii202105Statyi30
- [8] Bondareva S.A. (2017). Features of increasing financial literacy of youth: methodological aspect. pp. 44-49.
- [9] Chaplinskaya A. (2019). Fundamentals of financial literacy in Latvia. *Bankaĥskivesnik*. pp. 44 – 49
- [10] Stepnova O.V., & Starchikova I.Yu. (2021). Financial literacy of students of technical universities: analysis of opinions and development prospects / No. 1 (49). pp. 80-91.

### Article history:

Received 5 November 2023

Accepted 14 December 2023

# GUIDING PRINCIPLES FOR FOSTERING ECONOMIC GROWTH IN PRIVATE SECONDARY SCHOOLS ILLUSTRATION THROUGH THE BUSINESS MODEL GENERATION

**PENJIŠEVIĆ Aleksandra<sup>1</sup>, NIKITOVIĆ Zorana<sup>2</sup>, SOMBORAC Borko<sup>3</sup>, D'Arconte Carmine<sup>4</sup>**

<sup>1,3</sup>Union "Nikola Tesla" University, Faculty of Management, Sremski Karlovc (SERBIA)

<sup>2</sup>Faculty of Business, Economics and Entrepreneurship, Belgrad (SERBIA)

<sup>4</sup>Università del Foro Italico, Roma (ITALY)

E-mail: [aleksandra\\_penjisevic@yahoo.com](mailto:aleksandra_penjisevic@yahoo.com); [zorana.nikitovic@vspep.edu.rs](mailto:zorana.nikitovic@vspep.edu.rs); [borko.somborac2009@gmail.com](mailto:borko.somborac2009@gmail.com); [carmine.darconte@tiscali.it](mailto:carmine.darconte@tiscali.it)

## ABSTRACT

*Education, as the primary driving force in any society, demands special consideration when adapting the education system's concept for enhanced efficiency and competitiveness while ensuring the delivery of high-quality educational services. Observations, not only in the Republic of Serbia but also in various other nations, indicate that private schools can stand as equal participants in the educational services market, and in some cases, even surpass public schools in terms of quality. Simultaneously, private schools are driven by business goals.*

*The paper specifically addresses the attainment of specific objectives, such as formulating a strategic vision that delineates the key competencies of private high schools and outlines their strategic choices. To fulfill this objective, the Business Model Generation was employed to delineate the forthcoming operational and strategic objectives of the school. Utilizing both general and specific quantitative methods, alongside business modeling, will shape an appropriate development strategy aimed at enhancing the competitiveness and quality of service provision in private high schools.*

**Keywords:** *secondary education, quantitative research, strategic analysis, business model generation*

**JEL:** A21, A22, C10

**DOI:** 10.5937/intrev2304080P

**UDC:** 373.5:330.34.014

**COBISS.SR-ID** 133912841

## INTRODUCTION

Education is the main driving force of any society and therefore requires special attention, especially when it comes to adapting the concept of the education system, its efficiency, and competitiveness [1],[2]. Consequently, quality education, which is based on knowledge, is undoubtedly of great importance in the development of any economy. Numerous changes in this aspect from day to day are gaining more and more importance and impose new challenges that require new approaches in education and learning. In order to create positive results, the educational system must be well and efficiently organized [3]. Undoubtedly, the first goal of educational institutions is to provide quality educational services. This applies to all levels and forms of education and to all countries. Practice not only in the Republic of Serbia, but also in other countries shows that private schools can be an equal participant in the market of educational services, and even surpass public schools in quality. At the same time, however, they have business goals to achieve. Like any business venture, they are expected to recoup their investment

This paper specifically comments on the achievement of specific goals of secondary schools, such as: creating a strategic vision that identifies the main competencies of private secondary schools and that determines their strategic choice; identification of quality elements that affect the satisfaction of users of educational services; formulation and definition of communication tools in order to achieve effective promotion, image creation and long-term relationships with service users; defining methodological procedures for collecting empirical data for the needs of educational institutions, which enable the adoption of quantitative and qualitative determination of phenomena, attitudes and development strategies; integration of new communication technology into the education system and formulation of adequate marketing strategies for efficient and effective management of business processes in private high schools. Combining the two objectives - product quality and return on investment requires the implementation of an adequate management policy, which in turn should be supported by in-depth quantitative and qualitative analysis.

The success of an educational institution at any level of education is reflected in the success of maintaining standards in both teaching and learning. The emergence of a new goal - return on investment, is a huge challenge for system management. To overcome this, it is necessary to change the way this system is monitored and evaluated [4]. In other words, in addition to the classic indicators of service quality, other quantitative indicators should be monitored depending on the volume of supply and demand for the service [5]. Their timely processing allows you to catch trends at a sufficiently early stage.

Only with the help of continuous monitoring of the dynamics of factors: 1) Processes of democratization and decentralization of education, in addition to increased demands and responsibilities for achieving the goals of education, directly affect the change in the organization of business of educational institutions; 2) Establishment of a quality assurance system in educational institutions implies the introduction of a series of procedures related to the development of monitoring and evaluation, timely evaluation of implementation and compliance with existing procedural standards; 3) The market is heterogeneous in terms of supply and demand. This diversity is largely determined by differences in the approaches of different high schools and their view of the types and quality of educational services, differences in consumer needs, and attitudes.

## DEFINING THE BUSINESS MODEL AND STRATEGIC GUIDELINES FOR THE DEVELOPMENT OF PRIVATE SCHOOLS IN THE REPUBLIC OF SERBIA

There are many models that create a good business strategy. The model that will be used to create a good business strategy for private secondary education is Business Model Generation [6]. The model has proven to be extremely relevant in many industries. Among its advantages is that it manages to combine the structural elements of the business to integrate operational and strategic factors and define their impact on costs and revenues [7], [8]. During the transition, the socio-political climate that is currently present in the Republic of Serbia, regardless of the professional work of the educational institution, endangers the institution itself. It is important in this case that the educational institution correctly assesses the current advantages and disadvantages and how to reduce or completely eliminate the weaknesses and use the advantages. All activities must be related to the design of new solutions that will be implemented in order to provide a service of extremely high quality [9].

## RESEARCH METHOD

The research is based on direct and indirect observation and experience in the last fifteen years of the private school "Dr. Kosta Cukić". For Business Model Generation, calculations and analyzes were made based on interviews, monitoring, and observation of school work. The main questions are how and what is the best approach to identify the main drivers of change and how to react and implement change? The following hypotheses have been defined:

H01: Effective use of management techniques such as PESTLE, SWOT, and business model generation should increase the efficiency of identifying the main drivers of change in school business.

H02: Identification, assessment, and evaluation of critical educational operational activities identified based on the above analysis will improve school competitiveness in the education market.

H03: Using Business Model Generation to identify the weakest operational and business activities will minimize costs and improve revenue flow and improve financial stability.

## SWOT AND PESTEL ANALYSIS

### SWOT ANALYSIS OF THE SCHOOL "DR. KOSTA CUKIĆ"

Analysis of the situation in the school can be done in several ways, using SWOT, 5S, analysis of strengths and weaknesses, analysis of strengths and weaknesses, analysis of critical success factors, analysis of comparisons, analysis of financial and accounting data, or primary [10], [11]. For the needs of the analysis, a SWOT analysis was selected for this research.

The SWOT analysis was done on the basis of (1) long-term and empirical experience of the authors' work in private schools and in education in general; (2) the results of primary and original research, which helped to identify the pros and cons of the school, as well as the opportunities and dangers that come from the business environment; (3) official meetings, school activities, especially reactions from colleagues, students and parents helped to understand how and in what way SWOT characteristics affect school operations, and (4) interviews and interviews with the school principal and CFO as part of qualitative analysis.

*Table 1. SWOT analysis of the private school "Dr Kosta Cukić"*

STRENGTHS	WEAKNESSES
<ul style="list-style-type: none"> <li>• Good location of the school (center of Zemun)</li> <li>• Quality teaching staff (80% of employees with about 15 years of experience, 20% of employees with a master's or MSc degree)</li> <li>• The school operates within SC Pinki, which has an Olympic swimming pool, football halls, gyms (use of swimming pools and halls for physical education)</li> <li>• Modern approach of the teaching process (different teaching methods and techniques: lectures, individual teaching, consultations and talks, use of the laboratory, online support)</li> </ul>	<ul style="list-style-type: none"> <li>• Decreased motivation of teaching staff</li> <li>• Tuition fee</li> <li>• Opening of new schools nearby</li> <li>• Market analysis is descriptive, subjective, and based on a small sample</li> <li>• Maximizing business profits and earnings</li> <li>• Lack of teamwork and inter-functional relations between school professional councils</li> <li>• Insufficiently effective cooperation between the management and teachers</li> <li>• Ineffective model of promotion and use of marketing</li> <li>• Poor coordination and cooperation with industry</li> <li>• Poor cooperation with major stockholders</li> </ul>

OPPORTUNITIES	THREATS
<ul style="list-style-type: none"> <li>• Leadership position (15 years of business)</li> <li>• Introduction of new extracurricular activities</li> <li>• Improving online and digital promotion</li> <li>• Using online learning platforms</li> <li>• Personalized learning system</li> <li>• Organizing and cooperating with major stakeholders</li> <li>• Organizing additional elements of adult education in the evening and providing consulting services</li> <li>• Use of EU projects</li> <li>• Organizing alumni support from alumni and local organizations</li> <li>• Improving cooperation with local business and service organizations</li> </ul>	<ul style="list-style-type: none"> <li>• Absence of support from the Ministry of Education, Science and Technological Development</li> <li>• Lack of quality teachers - large migration</li> <li>• Unstable economic and political situation</li> <li>• Fewer students completing primary education</li> </ul>

Source: Authors research 2021

### PESTEL analysis and the impact of the environment on the business of the private school "Dr. Kosta Cukić"

PESTEL analysis provides a comprehensive list of factors that can affect the success or failure of a strategy [12]. PESTEL is an abbreviation of Political, Economic, Social, Technological, Environmental, and Legal factors that have a strategic impact on the organization. Although we find this analysis in several forms, such as PEST, PESTLE, PESTEEL, and PESTELO, the principle is the same everywhere. An organization that wants to do a quick analysis can focus only on the first four types of factors (political, economic, social, and technological). Some organizations, however, have to take into account the factor of education, and hence the PESTEEL analysis.

Table 2. PESTEL analysis of the private school "Dr. Kosta Cukić"

PESTLE factors	How does it affect the organization?	Potential impact				Implications and significance										Rating					
		H	M	S	I	Time frame (year)	Type	Influence	Relative importance	The need to react	Capacity										
												0-1	1-3	3+	+	-	+/-	S	U	W	C
<b>POLITICAL FACTORS</b>		High																			
1. Unstable political situation	Schools are insecure, there is no support and it is difficult to define school policy in the medium and long term.	High	3+		Negative		Strong		Crucial								High	Limited			

2. Weak and uncertain education strategy	Instability, the dominance of the influence of political party structures, uncertainty, and corruption.	High	3+	Negative	Weak	Important	High	Limited
3. Weak and inefficient policy of the Ministry of Education for private schools	Undefined property relations, private and public education function as separate systems.	Medium	1 - 3	Negative	Strong	Important	High	Limited
4. Subjectivity and undefined criteria in inspections and controls	It creates nervousness, insecurity, and the constant danger of closing schools	High	0 – 1	Negative	Strong	Important	High	Limited
<b>ECONOMIC FACTORS</b>								
1. Weak and unstable GDP growth	Uncertainty, low wages and poorer population, especially the lack of domestic students for enrollment	Medium	1 - 3	Negative	Strong	Important	High	Limited
2. High taxes and fees	It creates uncertainty and frequent changes in the law affect the business and earnings of the school	Medium	1 - 3	Negative	Strong	Important	High	Limited
3. High price growth and high inflation	The cost of inputs and hunting costs are constantly rising	High	1 - 3	Negative	Strong	Important	High	Limited
4. High prices of communal services		Medium	1 - 3	Negative	Strong	Important	High	Limited
<b>SOCIAL FACTORS</b>								
1. Demographic factors	Low population growth and a very low influx of new students.	Medium	3 +	Negative	Strong	Important	High	Limited
2. Migration of young and talented people, leaving the country	Young families are leaving the country and the richest families are sending schools abroad	Medium	1 - 3	Negative	Strong	Important	High	Limited
3. Status symbols	Raises awareness of the importance of education in private schools and preparing children for careers and continuing their education abroad	Medium	1 - 3	Negative	Strong	Important	High	Limited
4. Customs, norms, values and beliefs	Prestige, exclusivity, acquisition of new skills, knowledge of new	Medium	1 - 3	Negative	Strong	Important	High	Limited

	languages, and preparation for the labor market							
<b>TECHNOLOGICAL FACTORS</b>								
1. Internet and online technologies	It requires high investments, technical knowledge, good software, and specific application in educational institutions.	High		Positive	Strong	Important	High	Satisfactory
2. Digital communications and marketing	New knowledge and application of techniques and methods of online communication and digital promotion, which means understanding the concept of E-commerce and E-education. Progressive investment and high knowledge.	High	1 - 3	Positive	Strong	Important	High	Limited
3. ICT infrastructure	Modern and efficient computer equipment in classrooms, with a good learning platform and school website.	High	1 - 3	Positive	Strong	Important	High	Very good
4. Online learning and student support	Measure efficiency and further improve the support system	High	1 - 3	Positive	Strong	Important	High	Very good
<b>LEGAL FACTORS</b>								
1. Constant change of laws and regulations		Medium	1 - 3	Negative	Strong	Important	High	Limited
2. Amendments to the law on standards, conditions, and operations of private schools		High	1 - 3	Negative	Strong	Important	High	Limited
3. Tax and tax policy		High	1 - 3	Negative	Strong	Important	High	Limited
<b>ENVIRONMENTAL PROTECTION</b>								
1. Maintenance of green areas		High	1 - 3	Positive	Strong	Important	High	Very good
2. Waste disposal		Low	1 - 3	Positive	Weak	Important	High	Very good
3. Paper usage control		Low	1 - 3	Positive	Weak	Important	High	Very good
4. Sound reduction, control of external exhaust gases, and the use of sustainable materials		Medium	1 - 3	Positive	Unchanged	Important	High	Very good

*Source: Authors research, 2021; The potential impact factors can be H - high, M - medium, S - small and I - indeterminate; Implications can be positive (+), negative (-) and unknown (+/-); Influence of factors based on implications and significance can be strong (S), unchanged (U) or weak (W), iFactor by relative importance can be crucial (C), important (I), unimportant (U) and unknown (UK).*

PESTEL factors are viewed as a matrix that allows the school to identify and analyze each of these factors and their direct impact on school operations, especially on the organization of the educational process. The table identifies all PESTEL factors and each of them is individually identified and evaluated from the standpoint of the following criteria: (1) Potential impact of factors, (2) Implications of the impact factors, (3) Influence of factors based on implications and significance, and (4)

significance of factors by relative influence. The identification of PESTEL factors is very important in order to identify influences from the environment in which the school very often has little chance to change or correct them. When PESTEL factors are identified, analyzed, and evaluated then the chances of surprise are reduced. In this way, the school can react to changes faster, more efficiently, and effectively.

Prioritization and ranking of key activities, as well as assessment of negative factors on the position of the school and the context of management decisions, were performed by methods: 1) setting priorities; 2) ranking by importance and area of attention or investment (administrative and technical part, educational activities, marketing and promotion and reduction of costs in order to increase profits and personal income); 3) input-output analysis 4) cost-benefit analysis; 5) Mini-Maxi method as the main one to minimize costs and increase profits; 6) grades and logical reasoning; 7) advantages over disadvantages; 8) strengths against weaknesses; 9) benefits of evaluation in the short, medium and long term. The last ten years are not a good predictor of the next ten [13]. The model defines the basic elements that are ranked in order of importance.

### CREATING DEVELOPMENT STRATEGIES BASED ON THE GENERATED BUSINESS MODEL

Generating business models is an approach that shows how and in what way an organization, in this case, a private high school, creates, delivers, and generates value by providing educational services [14]. Scheme 1 shows and lists all the main elements of the model. Subsequent analysis (priority activities, intensity of activities, good versus poor performance elements), with original research and subsequent evaluation of model elements, identified and assessed the effectiveness of the main model elements in private high school. Performance levels were measured using three criteria, using high (green), medium (orange), and critical (red) efficiencies.

Business Model Generation - High School Dr Kosta Cukic - Evaluation of the efficiency of the basic elements of the model

EFFICIENCY	<b>Key Partners</b> - Ministry of Education - Educational institutions - Elementary school - Publishing houses - Faculties and educational institutions - Association of Private High Schools in Serbia - Parents - Local community - School centers - Computer Local Center: Computers, Maintenance and Licenses	<b>Key Activities</b> - Educational activities (Teaching, seminars and exercises) - Support and advice for students - Mentoring - Monitoring and evaluation - Analysis and evaluation of student progress - Online support - Visits and excursions - Sports activities - Art and cultural program  <b>Key resources</b> - Professional and qualified teachers - Administration and technical support - Equipment and ICT - Laboratories	<b>Value Proposition</b> - Prestigious private education - Admission to elite universities - Work preparation - Developing and acquiring work habits - Connections and contacts (Alumni network) - Learning at least 2 foreign languages - Teacher-student ratio 1:12	<b>Customer Relationships</b> - Direct visits, contacts and talks - Open days and visits - Parent meetings - Closing ceremonies and award ceremony - Promotions and conferences - Meetings and seminars - Online support - Educational platforms - The social network - Website and promotional materials  <b>Channels</b> - Direct contacts - Indirect contacts - Educational platforms - School website - Social networks and online communications - Meetings with parents and potential beneficiaries - TV and Radio, newspapers, magazines - Personal recommendations	<b>Customer Segments</b> - Students - Students from abroad - Parents - Trainings, seminars and other services - Conferences and seminars - Projects and research - Donors	VALUE AND QUALITY OF SERVICES
	<b>Cost Structure</b> - Teachers and administrative workers (salaries and personal incomes) - Marketing and promotion - Development of services and online support - Maintenance of buildings, equipment - Licenses, certificates and verifications - Quality standards and licenses - Insurance and risk coverage		<b>Revenue Streams</b> - Tuition fee - Government funds - Educational services - Projects, conferences and seminars - Publishing - Donations and gifts			
High level of efficiency (Green) Medium level of effectiveness (Orange) Critical level of efficiency effectiveness (Red)						

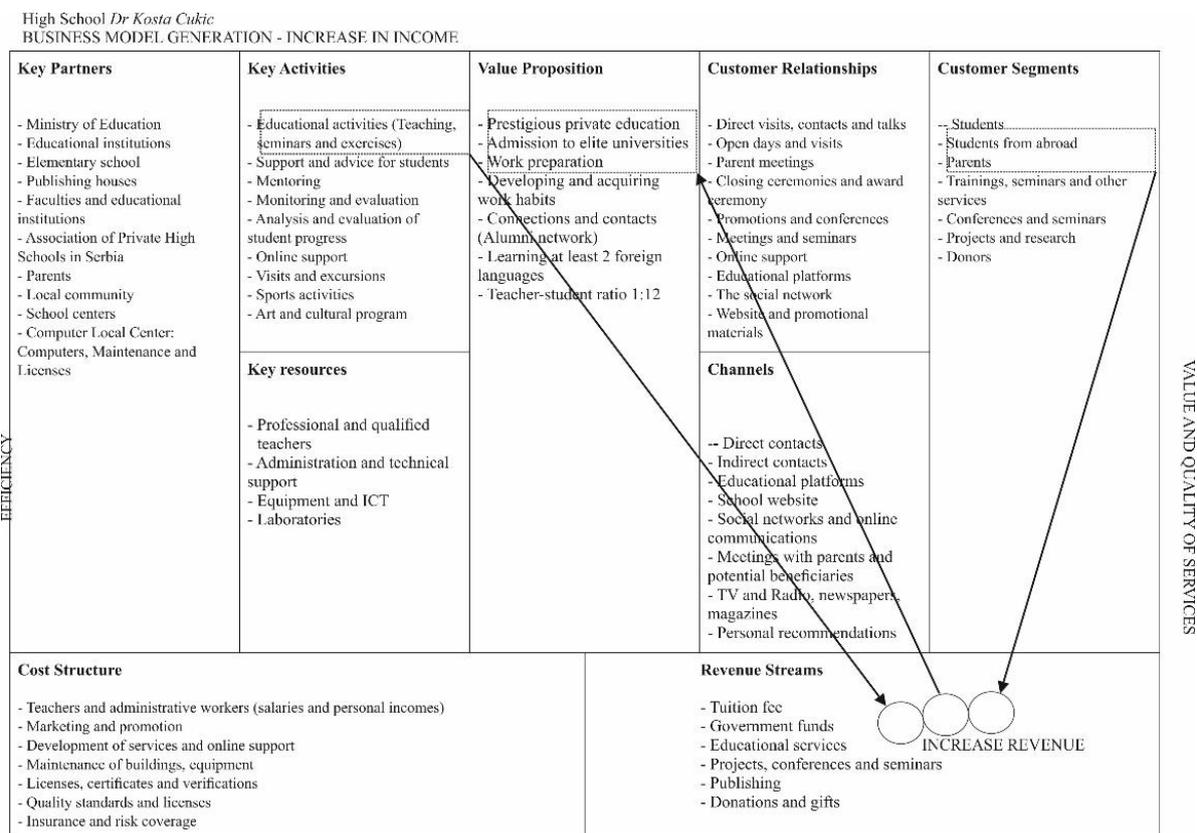
**Scheme 1.** Business Model Generation - the business of a private school, “Dr. Kosta Cukić” and evaluation of the efficiency of the basic elements of the model  
 Source: Authors research, 2021

Based on detailed analysis, evaluation, original research, observation, and monitoring, especially the experience of the author, the effectiveness of each element was assessed. It can be seen, the Key Partners were assessed critically, primarily because of the situation in the political system, unregulated political

pluralism, and the dominant influence of the ruling party on the situation in education. Thus, for example, the Ministry of Education shows little interest in the success and prosperity of private high schools. Frequent changes in laws and regulations also contribute to business insecurity and instability. The elements on the left side of the model that show the efficiency of the school with three key elements - Key activities, Key resources, Value proposition are marked in green, which shows a high degree of efficiency. Therefore, the school itself with basic resources, employees, and basic activities are the best organized and the most efficient part of the model.

The second part of the model, ie. the right side, measures the achieved, provided values, and the quality of business is less successful. Thus, the Customer relationships, Channels, and Customer segments were rated with an average rating and are therefore shown in orange. As can be see, the basic activities related to distribution channels, customer relations, and specially identified segments are "new" categories of market and marketing activities for which the new owners do not have the hearing, knowledge, or managerial and managerial skills to raise it. at a higher and expected level.

In the second assessment and analysis, as well as in what way the basic elements of the model affect the increase in income, shown in Scheme 2, it can be concluded that the basic elements that contribute to increasing income are - Key activities, especially educational activities (teaching, seminars, and exercises), then, Value proposition, especially the advantages and image that private high schools have, such as prestige, admission to elite universities, job preparation, and finally, the Customer segment, domestic and international students.

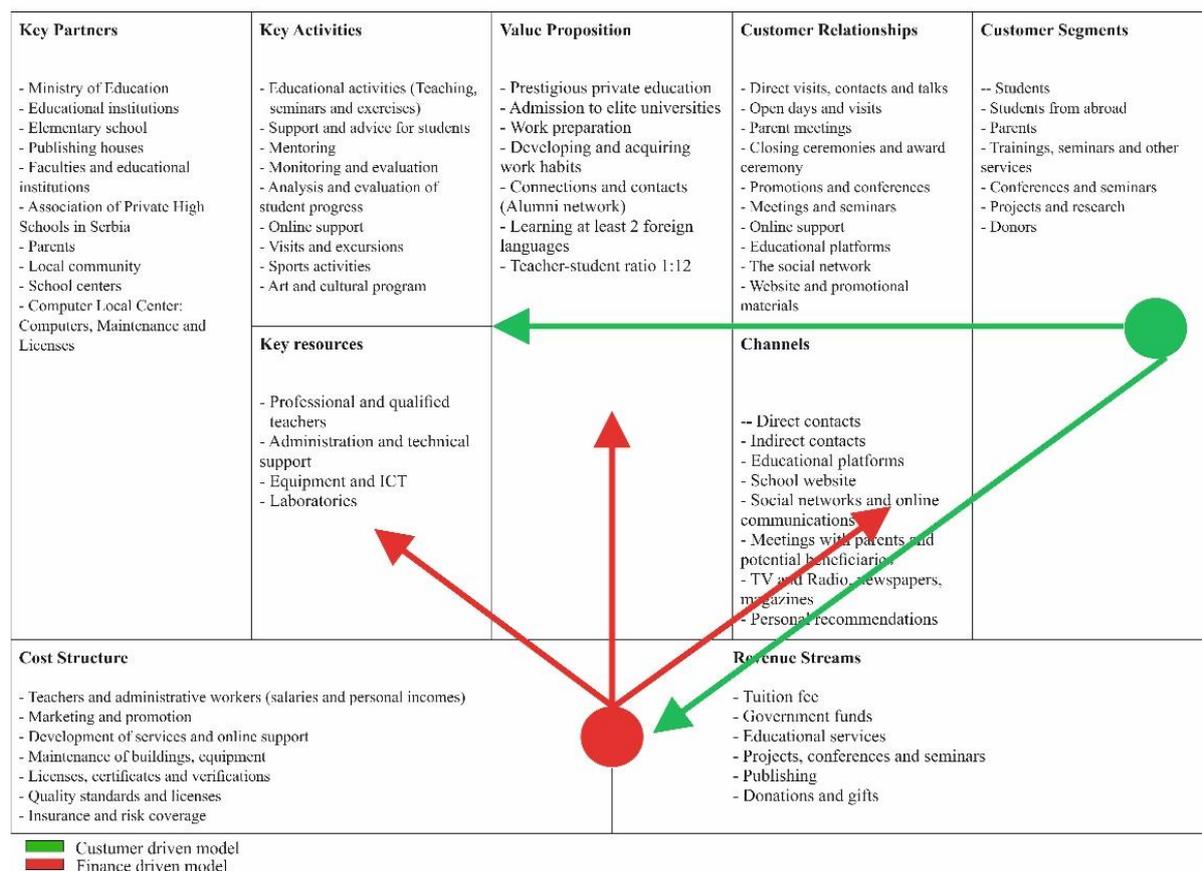


**Scheme 2. Private school Dr. Kosta Cukić, Belgrade BUSINESS MODEL GENERATION - INCREASE IN INCOME**

Source: Authors research, 2021

It is obvious that in the future development strategy, all elements of the model should be improved, synchronized, and integrated into a consistent, logical, and connected model that systematically contributes to reducing costs, on the one hand, and improving revenues, on the other. Also, it is interesting that in the private high school, which is being analyzed, and in other schools in Serbia in general, two basic models dominate, which can be seen in scheme 3.

BUSINESS MODEL GENERATION - High School *Dr Kosta Cukić* - CUSTOMER DRIVEN AND FINANCE DRIVEN MODEL

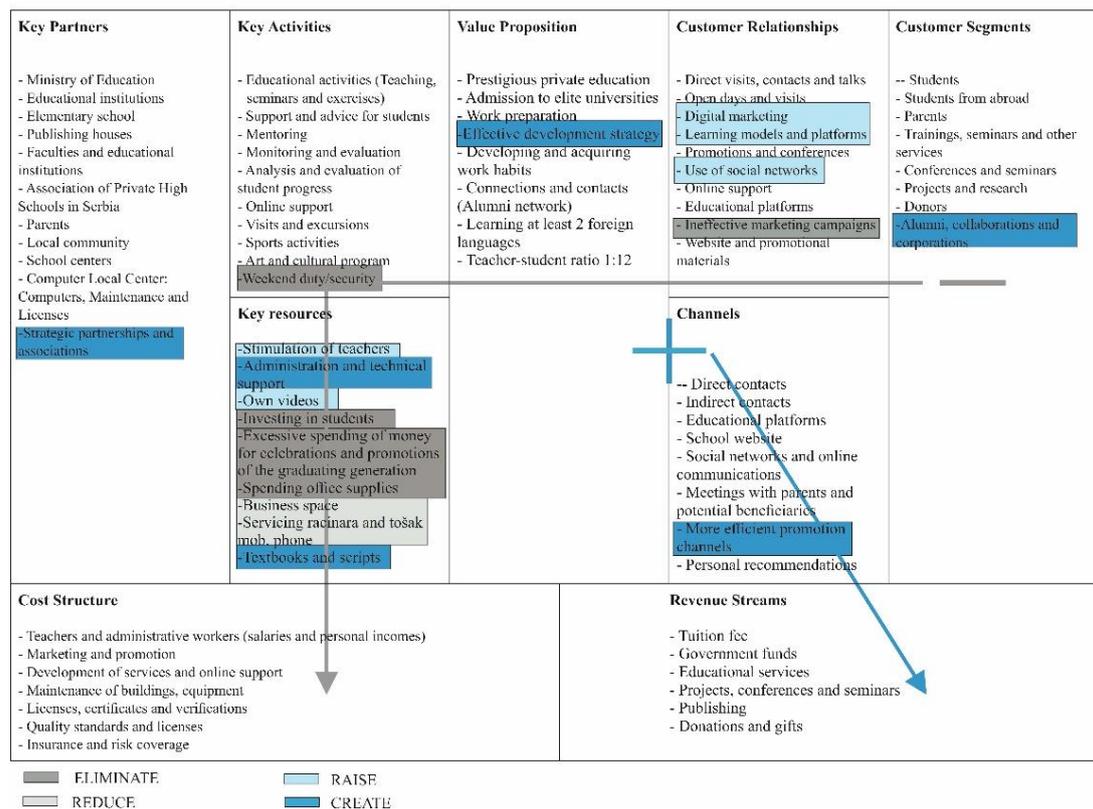


**Scheme 3. BUSINESS MODEL GENERATION - High school “Dr. Kosta Cukić” and the use of the model CUSTOMER DRIVEN AND FINANCE DRIVEN MODEL**  
 Source: Authors research, 2021

The basic models for creating and increasing income in a private high school are the so-called Customer-driven (service users, ie students, and parents, are the basic flywheel of increasing income) & Finance driven model (finances and interests of owners) is the second and dominant driver for increasing and inflow of income. These two models carry many limitations, especially when it comes to the capital, interest, and earnings of the owner. Key partners, in particular Government assistance and support, control, and more stable defined quality standards, should contribute to business stability that would reduce risks and increase revenues. It is also important that the greater impact on revenue inflows comes from customer relationships. Many activities should generate stability, consistency of use, promotion of reputation, and higher enrollment and thus more stable income [15], [16].

It is very important before any definition of growth and development strategies to evaluate the contents of the model elements according to the principle of strict evaluation and final assessment of the future of these activities by assessing what should be eliminated, reduced, increased, and specially created.

BUSINESS MODEL GENERATION - High School *Dr Kosta Cukić* - The process of minimizing costs and maximizing revenue



**Scheme 4. BUSINESS MODEL GENERATION - School "Dr Kosta Cukić". The process of minimizing costs and maximizing revenue**  
 Source: Authors research, 2021

As can be seen from Scheme 4 by applying the model based on the Blue Strategy Framework, each of these activities - eliminate, reduce, increase, create directly affects the minimization of costs and maximize revenue. The assessment of all these activities is done on the basis of internal documents of the high school, especially accounting and financial indicators, and comparison with the practice of leading private schools in the education sector. Also, it is very important that all school employees, especially teachers and the management teams, participate equally in the application of this model. It is obvious that there is a conflict of interest between teachers and their commitment to teaching the knowledge of students and owners of private schools whose main goal is to maximize profits.

## CONCLUSION

Using the effective and systematic approach provided by "Business Model Generation": first, the efficiency of the basic elements of the model (Key partners, key activities, Value proposition, Customer Relationships, Channels, Customer Segment, Cost Structure, and Revenue Streams) was assessed using a scale - high, medium and critical efficiency; second, the basic elements of the model that affect the increase of school income have been identified; third, the two areas from which the school received the most incentives for future development were identified. It is the satisfaction of service users, primarily parents and students (Customer Driven Model) and secondly, profit generation and earnings of school owners (Finance Driven Model); fourth, the basic processes and activities that affect the growth and decline of income have been identified by proposing what should be eliminated, reduced, increased or created in the school. Finally, this research points out that with the help of quantitative methods and strategic models, it is possible to create good business policies, i.e., how to manage a private school in order to place it in the position of a leader in the category in which it operates, with the delivery of the highest quality services and provide the owner or shareholders with maximizing revenue while minimizing costs.

## REFERENCES

- [1] Penjišević, A. (2016). Statistical processing and analysis of research results in the area of student support, based on a private and a public-school example. *Knowledge, International Journal Skopje*, Vol. 12, No.3, pp.11.
- [2] Vujičić, M., Ristić, L. (2015). Higher educational system of the Republic of Serbia in support of sustainable development: Challenges of the EU integration. *Megatrend revija*, Vol. 12, No. 1, pp. 139-156.
- [3] Stevanović, M., Staletović, M., Bačevac, S. (2022). Factors that in the modern environment determine the development of Serbian economy. *International Review*, Vol. 3-4, pp. 84-88.
- [4] Ivanović M. (2015). *Guidebook for strategic Planning*. London.
- [5] Somborac, B., Penjišević, A., Lazović, I. (2022). The Modern Paradigm of Adverse Working Conditions Impact on Serbian SMEs from Employees Perspective: Empirical and Statistical Findings. *International Conference "New Technologies, Development and Applications"*, pp. 1111-1118.
- [6] Osterwalder, A., Pigneur, Y. (2010). *Business Model Generation: A Handbook for Visionaries, Game Changers, and Challengers*. Hoboken N.J., Wiley.
- [7] Apte, U. M., Davis, M. M. (2019). Sharing economy services: Business model generation. *California Management Review*, Vol. 61, No. 2, pp. 104–31.
- [8] Salum, F. A., Coleta, K. G., Rodrigues, D. P., Lopes, H. E. G. (2019). The business models' value dimensions: an analytical tool. (*Revista Ibero Americana de Estratégia*), Vol. 18, No. 3, pp. 438–59,
- [9] Panić, A. A., Lozanov-Crvenković, Z. (2019). Analysis of higher education indicators coherency in central and eastern Europe. *Business Systems Research: International journal of the Society for Advancing Innovation and Research in Economy*, Vol. 10, No. 2, pp. 6–17.
- [10] Daniela, V. (2017). The SWOT Analysis of Pre-University Education. *Ovidius University Annals, Series Economic Sciences*, Vol. 17, No. 1, pp. 601–5.
- [11] Li, L. (2020). The Management Implications of SWOT & SOAR Analysis of Classroom Dynamics: A Case Study in China. *Organization Development Journal*, Vol. 38, No. 4, pp. 23–39.
- [12] Pan, W., Chen, L., & Zhan, W. (2019). PESTEL Analysis of Construction Productivity Enhancement Strategies: A Case Study of Three Economies. *Journal of Management in Engineering*, Vol. 35, No. 1, pp. 1–15.
- [13] Denna, E. (2014). *The Business Model of Higher Education*.
- [14] Stoica, E. A., Bogoslov, I. A., Serbu, R. S. (2023). Scientific research perspectives on the relationship between FinTech and education. *International Review*, Vol. 1-2, pp. 22-32.
- [15] Nikolić, M., Mihajlović, L. S. (2020). Strategijska analiza poslovanja preduzeća. *Trendovi u poslovanju*, Vol. 1, No. 15, pp. 28-36.
- [16] Šormaz, G. B., Anđelić, S., Blagojević, M. M. (2019). Određenje savremenog menadžmenta u obrazovanju. *Trendovi u poslovanju*, Vol. 1, No. 13, pp. 37-48.

### Article history:

Received 5 January 2022

Accepted 28 November 2023

# THE EFFECT OF INTERNAL MARKETING ON EMPLOYEES' ORGANIZATIONAL COMMITMENT THROUGH THEIR JOB SATISFACTION: THE CASE OF HEALTHCARE SECTOR IN SERBIA

JOVANOVIĆ Vesna<sup>1</sup>, NJEGIĆ Katarina<sup>2</sup>, MILANOVIĆ Vesna<sup>3</sup>

<sup>1</sup>Institute for Orthopedic Surgery "Banjica", Belgrade (SERBIA)

<sup>2</sup>Faculty of Business Economics and Entrepreneurship, Belgrade (SERBIA)

<sup>3</sup>Faculty of Business and Law, University "MB", Belgrade (SERBIA)

E-mail: ortvj@yahoo.com, katarina.njegic@gmail.com, vmilanovic555@gmail.com

## ABSTRACT

*The purpose of this paper was to examine the link between internal marketing (IM) and employees' organizational commitment (OC) through their job satisfaction (JS). The data were collected through an on-line survey from 278 employees in various public healthcare institutions in Belgrade. In order to test the hypotheses, partial least squares structural equation modelling was used. The results of this research showed that employees' JS partially mediates the relationship between IM activities and employees' OC. These results are relevant for healthcare marketing professionals and managers of healthcare institutions since they show the significant role of IM in improving employees' OC and the importance of nurturing employees' JS as a job-related attitude. The obtained results are also important since they support decision makers in promoting the IM concept in healthcare sector.*

**Keywords:** internal marketing, job satisfaction, organisational commitment, public healthcare sector

**JEL:**M30

**DOI:** 10.5937/intrev2304091J

**UDC:** 005.57: [331.101.32:616-051(497.11)]

**COBISS.SR-ID** 133913865

## INTRODUCTION

The primary goal of healthcare sector is to provide quality health services, to ensure patients' satisfaction and social well-being. Human resources possessing knowledge, skills, and abilities [1], especially medical staff, considerably contribute to the achievement of this goal. Employees who are more committed to their healthcare institution achieve better job performance [2], they contribute more to the quality of healthcare services [3] increasing patients' satisfaction [4]. Thus, it is of great importance for researchers and practitioners to find a way to enhance employees' organizational commitment - OC [5] to their healthcare institution. Previous research shows that internal marketing (IM) increases OC [3] [6] [7]. In addition, improving employees' job satisfaction (JS) was also found to be a good way to enhance OC [8]. This is crucial since committed and satisfied employees improve retention rates in healthcare institution [9], which is necessary considering that the healthcare sector is characterized by a significant employees' turnover [10]. Previous studies showed that IM in healthcare institutions affects employees' JS as well [7] [11] [12], and that IM develops based on the increase of employees' JS [13]. However, it is not thoroughly examined how to encourage employees' OC to their healthcare institution through IM. In addition, studies in this area from Serbia are scarce. Therefore, the purpose of this paper was to fill this gap in the literature by testing the model of the effect of IM on employees' OC through their JS on a sample of respondents working in the health sector in Serbia.

## LITERATURE REVIEW

IM ensures "that the organization attracts, selects and retains the best employees, and that these employees see, appreciate and value their role in the delivering of excellent quality of service to external customers" through activities like vision, development, and rewards [14]. Thus, the implementation and nurturing of IM has been suggested in healthcare settings, as well [14]. JS, as the employee's job-related attitude, refers to the employee's satisfaction with different aspects of his/her job like satisfaction with job content, relationships with co-workers, management, supervisor, etc. [15]. OC represents the employee's organization-related attitude. Allen and Mayer's three-component model of OC includes its affective, continuance, and normative component [16]. The affective component relates to the employee's emotional attachment to the organization, his/her identification with it and involvement in it. The continuance component is based on the costs-related commitment that employee associates with potentially leaving the organization while normative commitment is associated with employee's sense of obligation to stay in the organization.

This paper is based on the internal marketing (IM) theory and the social exchange theory (SET). In the IM theory, it is emphasized that employees take positive attitudes in IM environment [14] [17][18][19]. According to SET, employees reciprocate to the organization with higher levels of their JS and OC after the organization has supported them through IM activities [20]. It is, also, expected that employees in healthcare institutions who adopt the IM concept will strive for higher levels of JS and OC. The model developed in this paper relies on the results of previous empirical studies which report that IM affects employees' JS [7] [11] [12] [21][22][23][24] and employees' OC [3] [7] [21][22][23][24][25]. It also builds on studies that address the mediating role of JS in the relationship between IM and employees' OC [8]; [21]; [22]. Accordingly, in this paper, it was assumed that:

- H1: IM has a positive effect on employees' OC to the healthcare institution.
- H2: IM has a positive effect on employees' JS.
- H3: Employees' JS has a positive effect on employees' OC to the healthcare institution.
- H4: IM indirectly affects employees' OC to the healthcare institution by increasing their JS.

## METHODOLOGY

### SAMPLE AND DATA COLLECTION PROCEDURE

For the purposes of this paper, we collected data through an on-line survey. Target respondents were people working in various public healthcare institutions in Belgrade (The Republic of Serbia). We applied convenient sampling technique. Contacts of managing directors of health institutions were

acquired through personal contacts. We asked managers to support our research and to send their employees an e-mail with the link to questionnaire and a request to fill it in. The data gathering lasted for two weeks and it was finished at the beginning of May 2023. At the end we obtained 278 fully completed questionnaires. According to Kline [26] and Hair et al. [27], this is a sufficient number of responses considering the complexity of the tested model and number of indicators used. The majority of the respondents in the sample were female (around 77%). Nurses and medical technicians prevail in the sample (37% medical doctors; 48% nurses/medical technicians; 15% other medical staff). The distribution of working experience of the respondents was relatively even (27% of the respondents had less than 10 years of working experience, around 27% of them had 11-20 years of working experience, around 30% had 21-30 years of working experience, and 16% had more than 30 years of experience). A larger share of respondents graduated from university or college (around 64%). Others finished high school (32%) or elementary school (4%).

## MEASUREMENT SCALES

The measurement scales used in the research were taken from renewed authors in the field. The respondents were asked to indicate to which extent they agree with the presented statements in the questionnaire (1-strongly disagree, 5-strongly agree).

IM (label: IntMark) was measured through 15 questions in the questionnaire (labels IM1-IM15). The scale was adopted from Foreman and Money [14]. In our model this variable was modelled as a second order reflective construct consisting of three separate dimensions: Vision (V1-V5), Development (D1-D6) and Rewards (R1-R4). Those three variables were modelled as a reflective construct on the first level.

For the assessment of the level of *employees'* JS (label: Satisfaction), we adjusted a scale developed by Alpern et al. [15]. We were especially interested in the aspects related to job content and relationship with co-workers. Thus, we singled out from the scale items that relate to those specific dimensions of employees' satisfaction. The final scale incorporated 7 items (labelled ES1-ES7). In our model, *employees'* JS was formulated as a first order reflective construct.

OC (label: Commitment) was measured using a 24-item scale adapted from Allen and Meyer [16]. According to these authors, OC consists of three separate dimensions, namely: affective commitment (AffectComm; indicator labels: Affect1-Affect8), continuance commitment (ContComm; indicator labels: Cont1-Cont8), and normative commitment (NormComm; indicator labels: Norm1-Norm8). OC is, thus, modelled as a second-order reflective construct which is described by three reflective first order constructs - affective commitment, continuance commitment, and normative commitment.

## RESULTS AND DISCUSSION

In order to test the hypotheses, we used PLS-SEM. All calculations were done in SmartPLS 4.0.9.0. software. As it is suggested in the literature [28][29][30], we conducted PLS-SEM analysis in two-steps and in order to adequately assess the measurement model, we used the disjoint two-stage approach. The obtained results are presented below.

## MEASUREMENT MODEL ASSESSMENT

The primary analysis uncovered some convergent validity issues with the OC and IM scale. Thus, we had to eliminate some items that did not load well on the related constructs. There were also discriminant validity issues between IM construct and Employees' JS construct. In order to solve this problem, we eliminated some items from Employees' JS scale that had high correlations with the variable IM. After the necessary and minor adaptations of the scales used, we attained reliable and valid measurement model. The refined model is presented below (eliminated items are listed in the appendix). We summarized the results of the first and the second stage of the disjoint two-stage approach. The results are given in Table 1 and Table 2.

**Table 1. Descriptive statistics, reliability, and convergent validity indicators**

Constructs and their indicators	Mean	Std. Dev.	FA	Ch. Alpha	CR	AVE
<i>IM (second-order reflective construct)</i>	2.879	0.028		0.931	0.956	0.879
Vision (first-order reflective construct)	2.805	0.029	0.947	0.947	0.966	0.904
V1- My organization offers employees a vision that they can believe in	2.763	1.381	0.950			
V2- My organization communicates the vision well to employees	2.727	1.348	0.967			
V3- My organization communicates to employees the importance of their service roles	2.924	1.406	0.936			
Development (first-order reflective const.)	3.291	0.079	0.930	0.899	0.937	0.832
D1-- My organization prepare our employees to perform well	3.263	1.378	0.924			
D3- Skill and knowledge development of employees happens as an ongoing process in my organization	3.065	1.436	0.932			
D6- In my organization, the employees are properly trained to perform their service roles	3.547	1.279	0.879			
Rewards (first-order reflective construct)	2.541	0.032	0.935	0.945	0.960	0.858
R1 - Our performance measurement and reward systems encourage employees to work together	2.540	1.421	0.921			
R2 - My organization measure and reward employee performance that contributes most to our organization's vision	2.453	1.377	0.942			
R3 - In my organization, those employees who provide excellent service are rewarded for their effort	2.399	1.368	0.929			
R4 - My organization has the flexibility to accommodate the differing needs of employees	2.773	1.344	0.912			
JS (first-order reflective construct)	3.516	0.100		0.881	0.913	0.677
EJS2- I have an accurate written job description	3.554	1.320	0.827			
EJS3 -The amount of work I am expected to finish each week is reasonable.	3.338	1.325	0.810			
EJS4 - My department provides all the equipment, supplies, and resources necessary for me to perform my duties.	3.381	1.313	0.840			
EJS6- My co-workers and I work well together	3.856	1.095	0.791			
EJS7 - I feel I can easily communicate with members from all levels of this organization	3.450	1.320	0.845			
<i>OC (second-order reflective construct)</i>	3.047	0.005		0.799	0.879	0.708
Affective commitment (first-order r. c.)	3.096	0.059	0.892	0.877	0.915	0.731
Affect1- I would be very happy to spend the rest of my career with this organization	3.144	1.417	0.856			
Affect2 - I enjoy discussing my organization with people outside it	2.914	1.401	0.890			
Affect3 - I really feel as if this organization's problems are my own	3.086	1.417	0.806			
Affect7-This organization has a great deal of personal meaning for me	3.241	1.295	0.865			
Continuance commitment (first-order r. c.)	3.028	0.061	0.820	0.822	0.869	0.527
Cont2 - It would be very hard for me to leave my organization right now, even if I wanted to	3.112	1.348	0.735			
Cont3 - Too much in my life would be disrupted if I decided/I wanted to leave my organization now	3.140	1.327	0.786			
Cont5- Right now, staying with my organization is a matter of necessity as much as desire	3.248	1.189	0.614			
Cont6 - I feel that I have too few options to consider leaving this organization	2.867	1.357	0.731			
Cont7 - One of the few serious consequences of leaving this organization would be the scarcity of available alternatives	2.878	1.294	0.772			
Cont8 - One of the major reasons I continue to work for this organization is that leaving would require considerable personal sacrifice — another organization may not match the overall benefits I have here	2.924	1.293	0.705			

Normative commitment (first-order r. c.)	3.018	0.052	<i>0.810</i>	0.779	0.850	0.533
Norm1 - I think that people these days move from company to company too often	3.097	1.275	0.613			
Norm2 - I do not believe that a person must always be loyal to his or her organization. (R)	2.871	1.353	0.804			
Norm5 - If got another offer for a better job elsewhere I would not feel it was right to leave my organization	2.906	1.414	0.677			
Norm6 - I was taught to believe in the value of remaining loyal to one organization	2.950	1.372	0.819			
Norm7 - Things were better in the days when people stayed with one organization for most of their careers	3.266	1.322	0.719			

Note: FA: Factor loadings; r.c.: reflective construct; The italics we used for the values obtained in the second stage of the disjoint two-stage approach

We validated measurement scales based on factor loadings, Cronbach's alpha coefficient (Ch. Alpha), composite reliability (CR) and average variance extracted (AVE) since all constructs in the model were reflective. After the refinement of the scales, all factor loadings were above the recommended boundary of 0.5 [27]. We confirmed internal consistency reliability since the values of Cronbach's alpha were all above 0.7 and CR values were all above 0.7 as recommended in the literature [31] [32]. Convergent validity was also accomplished since  $CR > 0.7$ ,  $AVE > 0.5$ ,  $CR > AVE$  for all constructs in the refined model [33]. Discriminant validity was assessed using Heterotrait- Monotrait ratio (HTMT). The value of this ratio for all constructs in the refined model was lower than 0.9 as it is suggested in the literature [34]. The results obtained in both stages of the disjoint two-stage approach are presented in Table 2.

**Table 2. Discriminant validity based on HTMT ratio**

Constructs	Affect Comm	Int Mark	Cont Comm	Rewards	Norm Comm	Development	Commitment	Vision
IntMark	0.782							
ContComm	0.626	0.455						
Rewards	0.761	n.a.	0.445					
NormComm	0.664	0.512	0.677	0.494				
Development	0.733	n.a.	0.460	0.851	0.469			
Commitment	n.a.	0.738	n.a.	0.642	n.a.	0.630		
Vision	0.738	n.a.	0.395	0.889	0.497	0.888	0.613	
Satisfaction	0.742	0.880	0.531	0.791	0.486	0.886	0.727	0.797

Note: The italics we used for the values obtained in the second stage of the disjoint two-stage approach

## STRUCTURAL MODEL ASSESSMENT

The step that precedes the evaluation of the structural model is the examination of collinearity [35]. VIF values for both predictor variables in the model (IntMark and Satisfaction) were 2.782. This is below 3 which is the recommended threshold suggested by Hair et al. [28]. Next step was to assess the quality of the structural model for which we used the coefficient of determination -  $R^2$  [36] and Stone-Geisser's  $Q^2$  value [37][38]. For all endogenous constructs in the model,  $R^2$  was above the recommended threshold of 0.25 [39]. For the variable Commitment  $R^2$  was 0.470, and for the variable Satisfaction  $R^2$  was 0.641 indicating that endogenous constructs are very well explained by exogenous constructs in the model. We conducted PLSpredict procedure (omission distance = 10) in order to calculate  $Q^2$ . The obtained results indicated that model had good predictive relevance since for all endogenous constructs  $Q^2$  values were above zero ( $Q^2_{\text{Satisfaction}} = 0.637$ ,  $Q^2_{\text{Commitment}} = 0.439$ ) as it is recommended by [35].

We used Bootstrap procedure (BCa method; 5000 subsamples; two-tailed t-test; 5% significance level) in order to calculate significance of the t-value in each observed structural relationship in the model. Based on the obtained results, we evaluated the proposed hypotheses. The results of the Bootstrap procedure are presented in Table 3.

**Table 3.** Evaluation of the hypotheses

Hypotheses	Beta coefficient ( $\beta$ )	t-values	p-values	Supported
H1: IntMark -> Commitment	0.447	6.255	0.000	Yes
H2: IntMark -> Satisfaction	0.801	35.586	0.000	Yes
H3: Satisfaction -> Commitment	0.276	3.413	0.001	Yes
H4: IntMark -> Satisfaction -> Commitment	0.221	3.386	0.001	Yes

The results presented in Table 3 indicate that all the structural relationships in the model are significant. It was shown that there is a positive and statistically significant relationship between IM and OC (H1,  $\beta=0.447$ ;  $p<0.001$ ). The second hypothesis proposes that IM positively affects the level of employees' JS (H2) which was also supported ( $\beta=0.801$ ;  $p<0.001$ ). Our analysis showed that JS has a positive and statistically significant effect on OC ( $\beta=0.276$ ;  $p<0.001$ ), which confirms the third hypothesis (H3). Regarding the fourth hypothesis (H4), it was demonstrated that the indirect effect of IM on OC through JS is positive and statistically significant ( $\beta=0.221$ ;  $p<0.005$ ). Since the direct effect of IM on OC is also statistically significant (H1:  $\beta=0.447$ ;  $p<0.001$ ), JS partially mediates the relationship between IM and OC. In order to estimate the effect size of the relationships in the model, we observed Cohen's  $f^2$  [40]. All  $f^2$  values were above the lower bound of 0.02, thus it was concluded that all the effects are meaningful. The effect of IM on OC ( $f^2=0.134$ ) and the effect of JS on OC ( $f^2=0.051$ ) is weak, while the effect of IM on JS is very strong ( $f^2=1.782$ ).

The results presented in this paper showed that all hypotheses were confirmed. Our findings are consistent with the results of previous studies [3] [7] [8] [11] [12] [21][22][23][25]. These findings also support the principles of the IM theory and the SET. Employees in healthcare institutions that adopted the IM concept developed positive job- and organization-related attitudes which is in line with the IM theory [14] [17][18][19]. Besides, employees reciprocated to the healthcare institution by demonstrating higher levels of JS and OC since the healthcare institution supported them with IM activities. This notion is in line with the SET [20]. Results of our study contribute to the understanding of the improvement of employees' OC to the healthcare institution in the context of IM practice. Finally, this paper uncovers the complexity of the relationship between IM and OC. One part of the effect of IM on OC is realized directly and one part of that effect is transmitted indirectly through the improvement in employees' JS.

## CONCLUSION

This paper suggests that public healthcare institutions in Serbia can strengthen employees' OC by adopting IM practices and by cultivating employees' JS. For these institutions to be successful in implementing IM practices, managers should communicate to their employees a vision that they can believe in. Managers are also advised to pay attention to the employees' development and rewarding of their employees.

The results of the current research are relevant for healthcare marketing professionals and managers of healthcare institutions since they show the significant role of IM in improving employees' OC as well as the role of employees' JS in the relationship between IM and OC. By communicating the vision to employees, organizing trainings and education, by supporting professional and career development of their employees and by evaluating and rewarding their success, managers can contribute to improving employees' JS and OC. These IM activities lead to employees' satisfaction with job content and satisfaction with their relationship with co-workers. IM activities further lead to employees' emotional attachment to the healthcare institution, identification with it and involvement in it, to the continuation of work in the institution, and to a sense of obligation to stay in their institution. Only satisfied and committed employees are ready to deliver high quality of healthcare services. The results of this study support decision makers in promoting the IM concept in healthcare sector and highlight the importance of OC and IM in the sector that is a people focused.

This paper contributes to the better understanding the IM – employees' OC relationship in the health sector. It also emphasizes that it is not enough to explain solely the direct impact IM on employees' OC, rather it is crucial to uncover the mechanism through which IM affects OC. In order to motivate employees to achieve better performance and this way to contribute to the quality of healthcare services and patients' satisfaction, it is essential that healthcare institutions act on employees' OC through IM activities and also by increasing employees' JS.

Our study included various public healthcare institutions in Belgrade, thus the implications of this research are applicable to healthcare sector in Serbia and potentially to healthcare sector in the countries with similar level of development and analogous economic and social context. The main limitations of this study are associated with the general limitations that relate to convenient sampling technique. Thus, it is suggested to use random sampling in future research. Secondly, this research is a type of cross-sectional study, so it would be beneficial to conduct a longitudinal study in the future. In addition, the findings of our study encourage researchers to further investigate the link between IM and other job- and organizational-related attitudes.

## REFERENCES

- [1] Ćurčić, M., & Matejić, I. (2021). Knowledge management as a determinant of job satisfaction. *Trendovi u poslovanju*, 9(2), pp. 64-74. doi: 10.5937/trendpos2102069C
- [2] Sharma, J., & Dhar, R. L. (2016). Factors influencing job performance of nursing staff: mediating role of affective commitment. *Personnel Review*, 45(1), pp. 161-182. <https://doi.org/10.1108/PR-01-2014-0007>
- [3] Tsai, Y., & Wu, S. W. (2011). Using internal marketing to improve organizational commitment and service quality. *Journal of Advanced Nursing*, 67(12), 2593-2604. doi: 10.1111/j.1365-2648.2011.05696.x.
- [4] Murale, V., Singh, J., & Preetha, R. (2015). Employee commitment and patient satisfaction: An initial reflection from Indian healthcare sector. *International Journal on Customer Relations*, 3(1), 22. doi: 10.21863/ijcr/2015.3.1.004
- [5] Kreiner, J., Sajfert, D., Anđelić, S., Jančev, N., & Živković, M. (2021). Influence of entrepreneurs on job satisfaction and organizational commitment of employees. *Journal of Engineering Management and Competitiveness (JEMC)*, 11(2), 96-105. doi: 10.5937/jemc2102096K
- [6] Asiamah, N., Frimpong Opuni, F., & Kofi Mensah, H. (2020). The nexus between internal marketing in hospitals and organizational commitment: Incorporating the mediation roles of key job characteristics. *International Journal of Healthcare Management*, 13(S1), pp. 385-399. <https://doi.org/10.1080/20479700.2018.1551951>
- [7] Chen, S. Y., Wu, W. C., Chang, C. S., & Lin, C. T. (2015). Job rotation and internal marketing for increased job satisfaction and organisational commitment in hospital nursing staff. *Journal of Nursing Management*, 23(3), pp. 297-306. <https://doi.org/10.1111/jonm.12126>
- [8] Azeem, S. M., & Akhtar, N. (2014). The influence of work life balance and job satisfaction on organizational commitment of healthcare employees. *International Journal of Human Resource Studies*, 4(2), pp. 18-24. doi: 10.5296/ijhrs.v4i2.5667
- [9] Gellatly, I. R., Cowden, T. L., & Cummings, G. G. (2014). Staff Nurse Commitment, Work Relationships, and Turnover Intentions: A Latent Profile Analysis. *Nursing Research*, 63(3), pp. 170-181. doi: 10.1097/NNR.0000000000000035
- [10] Kim, J., H., Song, J., & Lee, C. K. (2016). Effects of Corporate Social Responsibility and Internal Marketing on Organizational Commitment and Turnover Intentions. *International Journal of Hospitality Management*, 55, pp. 25-32. doi: 10.1016/j.ijhm.2016.02.007.
- [11] Iliopoulos, E., & Priporas, C. V. (2011). The effect of internal marketing on job satisfaction in health services: a pilot study in public hospitals in Northern Greece. *BMC Health Services Research*, 11(1), pp. 1-8. <https://doi.org/10.1186/1472-6963-11-261>
- [12] Janjua, Q. R., Ahmad, H. M., & Afzal, A. (2014). The impact of internal marketing and the moderating role of organizational culture on nurse job satisfaction. *Journal of Business & Economics*, 6(2), pp. 203-244.
- [13] Nedeljković-Knežević, M., Škorić, J., & Mijatov, M. (2020). Correlations between dimensions of work motivation and dimensions of job satisfaction of employees in hotels and travel agencies. *Marketing*, 51(2), 131-140. doi: 10.5937/markt1904279N
- [14] Foreman, S., & Money, A. H. (1995). Internal marketing: concepts, measurement and application. *Journal of Marketing Management*, 11(8), pp. 755-768. doi: 10.1080/0267257X.1995.9964388.
- [15] Alpern, R., Canavan, M. E., Thompson, J. T., McNatt, Z., Tatek, D., Lindfield, T., & Bradley, E. H. (2013). Development of a brief instrument for assessing healthcare employee satisfaction in a low-income setting. *PloS one*, 8(11), e79053. doi: 10.1371/journal.pone.0079053
- [16] Allen, N. J., & Meyer, J. P. (1990). The measurement and antecedents of affective, continuance and normative commitment to the organization. *Journal of Occupational Psychology*, 63(1), pp. 1-18. <https://doi.org/10.1111/j.2044-8325.1990.tb00506.x>

- [17] Ahmed, P. K., & Rafiq, M. (2003). Internal marketing issues and challenges. *European Journal of Marketing*, 37(9), pp. 1177-1186. <https://doi.org/10.1108/03090560310498813>
- [18] Kotler, P., & Keller, K. (2016). *A Framework for Marketing Management*. Pearson.
- [19] Rafiq, M., & Ahmed, P. K. (2000). Advances in the Internal Marketing Concept: Definition, Synthesis and Extension. *Journal of Services Marketing*, 14(6), pp. 449-462. <https://doi.org/10.1108/08876040010347589>
- [20] Cropanzano, R., & Mitchell, M. S. (2005). Social exchange theory: An interdisciplinary review. *Journal of Management*, 31, 874e900. doi: 10.1177/0149206305279602
- [21] Ahmad, A. E. M. K., & Al-Borie, H. M. (2012). Impact of Internal Marketing on Job Satisfaction and Organizational Commitment: A Study of Teaching Hospitals in Saudi Arabia. *Business and Management Research*, 1(3), pp. 82-94. doi: 10.5430/bmr.v1n3p82
- [22] Choi, H. J., & Lee, E. (2012). Mediation effect of job satisfaction between internal marketing and organizational commitment of nurses in small and medium-sized hospitals. *Journal of Korean Academy of Nursing Administration*, 18(3), pp. 329-337.
- [23] Choi, H. J., Yang, J.-H., & Chang, D. M. (2014). Impact of Internal Marketing on Job Satisfaction, Job Commitment, Organizational Commitment, and Customer Orientation in Hospital Employees. *The Journal of the Korea Contents Association*, 14(11), pp. 783-797. doi: 10.5392/JKCA.2014.14.11.783
- [24] Işık, D. A., & Altunoğlu, A. E. (2016). The effects of internal marketing on some job attitudes: a study in private hospitals in Turkey. *Journal of Business Research – Turk*, 8(2), pp. 1-17. doi: 10.20491/isarder.2016217152
- [25] Tsai, Y. (2014). Learning organizations, internal marketing, and organizational commitment in hospitals. *BMC Health Services Research*, 14(152), pp. 1-8. <https://doi.org/10.1186/1472-6963-14-15>
- [26] Kline, R. B. (2005). *Principles and Practice of Structural Equation Modelling*. USA: The Guilford Press.
- [27] Hair, J. F., Black, W. C., & Babin, B. J., & Anderson, R. E. (2014). *Multivariate Data Analysis*. Harlow: Pearson Education Limited, Edinburgh Gate.
- [28] Hair Jr, J. F., Hult, G. T. M., Ringle, C., & Sarstedt, M. (2017). *A Primer on Partial Least Squares Structural Equation Modeling* (2<sup>nd</sup> ed.). Sage publications.
- [29] Sarstedt, M., Hair Jr, J. F., Cheah, J. H., Becker, J. M., & Ringle, C.M. (2019). How to specify, estimate, and validate higher-order constructs in PLS-SEM. *Australasian Marketing Journal*, 27(3), pp. 197-211.
- [30] Becker, J. M., Klein, K., & Wetzels, M. (2012). Hierarchical latent variable models in PLS-SEM: guidelines for using reflective-formative type models. *Long Range Planning*, 45(5-6), pp. 359-394.
- [31] Churchill, Jr, G. A. (1979). A Paradigm for Developing Better Measures of Marketing Constructs. *Journal of Marketing Research*, 16(1), pp. 64-73.
- [32] Diamantopoulos, A., Sarstedt, M., Fuchs, C., Wilczynski, P., & Kaiser, S. (2012). Guidelines for choosing between multi-item and single-item scales for construct measurement: a predictive validity perspective. *Journal of the Academy of Marketing Science*, 40(3), pp. 434-449.
- [33] Fornell, C., & Larcker, D. F. (1981). Evaluating structural equation models with unobservable variables and measurement error. *Journal of Marketing Research*, 18(1), pp. 39-50.
- [34] Henseler, J., Ringle, C. M., & Sarstedt, M. (2015). A new criterion for assessing discriminant validity in variance-based structural equation modeling. *Journal of the Academy of Marketing Science*, 43(1), pp. 115-135.
- [35] Hair, J. F., Risher, J. J., Sarstedt, M., & Ringle, C. M. (2019). When to use and how to report the results of PLS-SEM. *European Business Review*, 31(1), pp. 2-24.
- [36] Shmueli, G., & Koppius, O. R. (2011). Predictive Analytics in Information Systems Research. *MIS Quarterly*, 35(3), pp. 553-572.
- [37] Geisser, S. (1974). A predictive approach to the random effect model. *Biometrika*, 61(1), pp. 101-107.
- [38] Stone, M. (1974). Cross-validation and multinomial prediction. *Biometrika*, 61(3), pp. 509-515.
- [39] Richter, N. F., Sinkovics, R. R., Ringle, C. M., & Schlägel, C. M. (2015). A critical look at the use of SEM in international business research. *International Marketing Review*, 33(3), pp. 376-404.
- [40] Cohen, J. (1992). Quantitative methods in psychology: A power primer. *Psychological Bulletin*, 112(1), 155-159.

## APPENDIX

Item eliminated from the model:

Vision (IM scale):

V4- In my organization, considerable emphasis is placed on communicating with employees.

V5- The data my organization gathers from employees is used to improve their jobs, and to develop the strategy of the organization.

*Development (IM scale):*

D2- My organization views the development of knowledge and skills in employees as an investment rather than a cost.

D4 - In my organization, employees are taught "why they should do things" and not just "how they should do things".

D5- In my organization we go beyond training and educate employees as well.

*Employees' JS scale:*

EJS1- I am satisfied with my chances for promotion.

EJS5- The buildings, grounds and layout of this health facility are adequate for me to perform my work duties.

*AffectComm (Employees' OC):*

Affect4 - I think that I could easily become as attached to another organization as I am to this one (R).

Affect5 - I do not feel like 'part of the family' at my organization. (R)

Affect6 - I do not feel 'emotionally attached' to this organization. (R)

Affect8 - I do not feel a strong sense of belonging to my organization. (R)

*ContComm (Employees' OC):*

Cont1 - I am not afraid of what might happen if I quit my job without having another one lined up. (R)

Cont4 - It wouldn't be too costly for me to leave my organization now. (R)

*NormComm (Employees' OC):*

Norm3 - Jumping from organization to organization does not seem at all unethical to me. (R)

Norm4 - One of the major reasons I continue to work for this organization is that I believe that loyalty is important and therefore feel a sense of moral obligation to remain.

Norm8 - I do not think that wanting to be a 'company man' or 'company woman' is sensible anymore.

### Article history:

Received 13 June 2023

Accepted 19 September 2023

# PSYCHOSOCIAL FACTORS OF SUCCESSFUL ADAPTATION TO REMOTE WORK IN THE WESTERN BALKANS

**RADULOVIĆ Sofija<sup>1</sup>, DIMITRIJEVIĆ Ljiljana<sup>2</sup>, NIKOLIĆ-ILIĆ Žaklina<sup>3</sup>, SILVER KYARUZI Imani<sup>4</sup>**

<sup>1</sup>Faculty of law for commerce and judiciary, University Business Academy (SERBIA)

<sup>2</sup>Faculty of Business Economics and Entrepreneurship (SERBIA)

<sup>3</sup>Belgrade Banking Academy (SERBIA)

<sup>4</sup>QAHE - Ulster University, Birmingham (Great Britain)

E-mails: [sofija.radulovic@pravni-fakultet.info](mailto:sofija.radulovic@pravni-fakultet.info), [ljiljana.dimitrijevic@vspep.edu.rs](mailto:ljiljana.dimitrijevic@vspep.edu.rs), [zaklina.nikolic-ilic@outlook.com](mailto:zaklina.nikolic-ilic@outlook.com)

## ABSTRACT

*In this study, psychosocial adaptation to remote work was examined on a representative sample of subjects from Western Balkans (Bosnia and Herzegovina, Montenegro, North Macedonia and Serbia). The research was conducted using a questionnaire adapted from the Psychosocial Adaptation Scale. The research goals were to describe the positive and negative aspects of psychosocial adaptation to working from home, and then to examine the country specific behavioral patterns, as well as to validate the psychometric properties of the used scale. The results showed that the psychosocial adaptation of the respondents was generally good. However, the respondents in all four countries were most affected by the lack of time for socializing with close people and the feeling of social isolation due to working from/at home. The authors see one of the reasons for the difficulty of enduring social isolation and loneliness in the more pronounced collectivist patterns of sociability in the countries of the Western Balkans than in Western countries. The respondents from Montenegro show significantly weaker psychosocial adaptation in a number of aspects compared to respondents from the other three countries. In this respect, the respondents from North Macedonia are similar to them only to a lesser extent, while the respondents from BiH and Serbia are the most similar to each other. The authors have offered possible explanations for these similarities and differences.*

**Keywords:** work from (at) home, psychosocial adaptation, BiH, Montenegro, North Macedonia, Serbia

**JEL:** J24

**DOI:** 10.5937/intrev2304100R

**UDC:** 331.103:004.738.5

331.4:159.94-044.332-057.16(497-15)

**COBISS.SR-ID** 133915657

## INTRODUCTION

According to a series of studies on remote working, numerous positive economic contributions are highlighted – higher productivity, significant reduction of office space, time savings and a number of utility and transportation costs [1,2,3,4,5,6,7]. In contrast to economic ones, researchers are significantly less in agreement about the positive and negative psychosocial aspects of working from home, because, among other things, they are more difficult to operationalize and measure. Among the positive psychosocial factors, greater autonomy and freedom in business and work process planning stand out [8] as well as greater efficiency in fulfilling work tasks and greater self-confidence [9,10,11,12,13,14] greater commitment to work and job [15], more balanced fulfilment of work and non-work obligations [16] and improvement of communication skills [17]. It is considered that for the successful performance of work (from home) the most important thing is flexible working hours [18,19], systematic social support from family and managers [20] and a good work-life balance [21].

The negative consequences of working from home and remotely vary depending on demographic, social-psychological and cultural factors, but the most important thing is whether the research was conducted before or during the Covid-19 pandemic. Almost without exception, the more negative social-psychological consequences of working from home are more numerous, more severe if working from home was also practiced during the pandemic, and especially if working from home starts due to the Covid-19 pandemic. Uncertainty about the duration of the Pandemic, the preservation of work and income induces loss of self-confidence, anxiety and depression [22]. According to another survey on remote work from 2019, 49% of workers had mental health problems [23]. Similarly, in a survey of 2.500 remote workers, 66% of those under the age of 25 suffered from one or more symptoms of mental disorders [22]. Investigating the psychosocial problems of working from home, American social psychologists highlight the feelings of loneliness, social isolation, anxiety, stress and depression due to the loss of direct social interactions, and they especially emphasize the importance of the support of the social network (family, friends and employers [24]). Psychological responses to job uncertainty, salary reductions, productivity declines, layoffs, etc. during the Pandemic may include low mood, low motivation, exhaustion, anxiety, depression, burnout and suicidal thoughts, but also numerous physical health disorders such as digestive problems, changes in appetite and weight, dermatological reactions, fatigue, cardiovascular disorders and diseases, muscle-skeletal disorders, headaches and other unexplained pains [24,25] as well as addiction diseases.

## RESEARCH OBJECTIVES

Bearing in mind the aforementioned positive and negative effects of psychosocial factors on business when working from home, we set three research goals:

- describe the prevalence of the most common psychosocial factors.
- examine the structural characteristics of the factors.
- describe similarities and differences in psychosocial profiles in four Western Balkans countries.

## RESEARCH SAMPLE

Our sample included 1031 respondent from four countries of the Western Balkans: 201 from Bosnia and Herzegovina, 201 from Montenegro, 221 from North Macedonia, and 408 from Serbia. The sample has a convenient character because they include everyone who works from home and who agreed to fill out the questionnaire in electronic form.

## RESEARCH INSTRUMENT

For the purposes of this research, we have specially constructed a questionnaire that, based on a thorough review of the literature [26], is most often found among the negative and positive psychosocial aspects of home business. Answers were given on a five-point Likert-type scale, where 1 means "I completely disagree" and 5 means "I completely agree." The scale contains 14 statements, only 10 of which are given in binary form (See below).

## SCALE OF PSYCHOSOCIAL ADAPTATION TO WORKING FROM HOME

Since I have started my own business, I have much less time for myself and my hobbies.

Working from home does not prevent me from taking enough time and motivation to engage in physical activities (exercise/sports).

Working from home negatively affected the quantity and quality of sleep.

Since I work from home, I pay less attention to my family or my partner.

Since I work from home, I have more time to spend with friends.

The business I'm currently running fulfils me.

My current income is enough to cover all my basic needs.

I am sure of the future success of the business I am currently running

I have trouble separating my work from my personal life

Is your work area separate from the area where you spend your free time or sleep (a separate room, or a bedroom, living room, etc.)

I would like to have more contact with other people during my work

Since I work from home, I feel more tense and anxious

My family and close friends are mostly supportive of me in my current job.

While working from home, others (family, friends, neighbors) do not disturb me, and I can fully devote myself to work.

## RESEARCH METHOD

In this research, statistical analysis was first performed in the SPSS program, followed by qualitative analysis. In addition to descriptive statistics, ANOVA and Varimax factor analysis were also used. Qualitative analysis was performed by categorizing quantified data into certain qualitative categories. By integrating those categories, we obtained social-psychological profiles of those who work from home. As shown in the Table 1 below, in the case of the first item (Since I started my own business, I have much less time for myself and my hobbies.), there are significant differences among the countries. We applied ANOVA ( $F=9.881$ ;  $p=0.000$ ). The respondents from Montenegro actually have much less time for their hobbies and activities than the respondents from Bosnia and Herzegovina ( $I-J= -0.62189$ ;  $p=0.000$ ), the respondents from North Macedonia ( $I-J= -0.61165$ ;  $p=0.000$ ) and the respondents from Serbia ( $I-J= -0.58224$ ;  $p=0.000$ ). On the second item (Working from home does not prevent me from taking enough time and motivation to engage in physical activities (exercise/sports), the respondents from Montenegro gave negative answers significantly more often than the respondents from North Macedonia ( $I-J= -0.3224$ ;  $p=0.012$ ). Other differences are not significant.

**Table 1.** Distribution of items from the Psychosocial Adaptation Scale in four countries of the Western Balkans (negative statements on this Scale were recoded).

Claims*	Bosnia and Herzegovina			Montenegro			North Macedonia			Serbia			Overall:		
	No	Yes	Indec.	No	Yes	Indec.	No	Yes	Indec.	No	Indec.	Yes	No	Yes	Indec.
1.	19.4	37.8	42.8	64.3	27.4	28.4	37.1	9.5	53.4	34.3	17.2	48.6			
2.	15.5	20.4	64.2	17.9	27.9	54.3	19.0	11.8	69.3	23.3	13.5	63.2			
3	15.0	18,9	65,1	25,3	22,4	52,3	14,9	15,4	69,7	16,2	11,8	72,1	17,5	16,0	66,6
4.	9.5	15,9	74,7	24,9	23,4	51,6	20,4	11,8	67,9	16,9	17,2	65,4	17,8	17,0	65,3
5.	15.5	31.8	52.8	17.4	30.3	52.3	22.6	24.0	53.4	26.0	24.5	49.5	21.5	27.0	51.5
6.	7.5	17.9	74.6	3.5	29.4	67.2	20.8	13.1	66.1	9.0	18.4	72.5	10.2	19.3	70.5
7.	14.9	25.4	59.7	11.0	30.3	58.7	17.2	17.1	65.6	16.7	22.3	60.1	15.3	23.4	61.2
8.	10.0	28.4	61.7	9.5	24.9	65.7	22.2	19.0	58.9	16.4	26.5	57.2	15.0	24.9	60.1
9.	20.9	25.4	53.7	33.8	28.9	37.3	23.1	19.9	57.1	16.4	20.8	62.7	22.1	23.1	54.8
10.	38.3	27.4	34.3	54.7	18.4	26.8	40.8	27.1	32.2	33.8	28.4	37.8	40.2	26.0	33.8
11.	10.0	20.9	69.2	21.9	28.4	49.8	17.2	17.6	65.2	12.3	14.5	73.3	14.7	19.1	66.1
12.	3.5	14.4	82.1	4.0	21.9	74.1	17.6	13.6	68.8	5.9	11.8	82.4	7.15	14.6	77.8
13.	9.5	20.4	70.2	14.5	18.4	67.2	21.2	15.8	62.9	9.6	13.5	77.0	13.0	16.3	70.7

Table 1 shows that the respondents from Montenegro were relatively more faced with reduced and poor-quality sleep due to working from home; almost a quarter (22.4%) reported that they had problems sleeping. This was also confirmed by the results of the ANOVA ( $F=10.038$ ;  $p=0.000$ ). Moreover, the respondents from Montenegro had significantly more problems with sleep due to working at (from)

home than those from Bosnia and Herzegovina (I-J= -0.35821;  $p=0.004$ ) than those from North Macedonia (I-J= -0.52509;  $p=0.000$ ) and those from Serbia (I-J= -0.56940;  $p=0.000$ ).

Regarding the item 4 (*Since I work from home, I pay less attention to my family or my partner.*), the respondents from Montenegro again manifested significantly more agreement ( $F=8.243$ ;  $p=0.000$ ) than the respondents from Bosnia and Herzegovina (I-J= -0.60697;  $p=0.000$ ), North Macedonia (I-J= -0.35814) and Serbia (I-J= -0.43638). According to the fifth item (*Since I work from home, I have more time to spend with friends*) no statistically significant differences among the participants from different countries were found ( $F=1.182$ ;  $p=0.316$ ). The sixth item (*The business I'm currently running fulfils me*) shows that the respondents are generally satisfied with the work they do from home. The percentage of dissatisfied people ranges from 3.5% (Montenegro) to 9% (Serbia). The only exception is the respondents from North Macedonia, where the percentage of those dissatisfied with their jobs who work from home reaches as much as 20.8% (Table 1). ANOVA also showed that the respondents from North Macedonia are significantly less satisfied with their current work from home than all others ( $F=4.542$ ;  $p=0.004$ ). They are less satisfied than the respondents from BiH (I-J= -0.2982;  $p=0.005$ ), Montenegro (I-J= -0.2683;  $p=0.012$ ) and Serbia (I-J= -0.3220;  $p=0.000$ ). Three-fifths of the respondents from all four countries are very satisfied or satisfied with their current income, while the percentage of those who are dissatisfied amounts to only about one-sixth (Table 1). Although on the whole the respondents are more satisfied with work than income, the differences in satisfaction with income do not reach the level of statistical significance ( $F=0.122$ ;  $p=0.947$ ).

The respondents in all four countries are confident in the future success of their current job in about three-fifths of cases and ANOVA revealed no significant differences. The respondents from Montenegro have more problems separating their work from home from their private life than all others; a third stated that they had problems, and much less in the other countries (see Table 2). Those relative differences are the biggest compared to Serbia, where twice as many respondents had these problems (Table 2). The differences are statistically highly significant ( $F=14.023$ ;  $p=0.000$ ). Compared to Bosnia and Herzegovina, they are (I-J= -0.48259;  $p=0.000$ ), North Macedonia (I-J= -0.46386;  $p=0.000$ ) and Serbia (I-J= -0.73101;  $p=0.000$ ). The respondents from Montenegro less than all the others want to have contact with other people while working from home; it should be noted that more than half did not express that wish (Table 2). The differences are statistically significant compared to the other three countries; in relation to BiH (I-J= -0.35821;  $p=0.000$ ), North Macedonia (I-J= -0.32516;  $p=0.015$ ) and Serbia (I-J= -0.50578;  $p=0.000$ ). Due to working from home, the respondents from Montenegro are the most tense and anxious of all (Table 1). It is interesting to note that the respondents from Bosnia and Herzegovina in the highest percentage said that they do not feel tense and anxious while working from home (around 70%) and similarly those from North Macedonia, while the respondents from Serbia in almost three quarters of cases expressed confusion and ambivalence of feelings about working from home. The differences are statistically significant when it comes to Montenegro and others, as well as between Serbia and Macedonia ( $F=12.672$ ;  $p=0.000$ ). The respondents from Montenegro are significantly more tense and anxious while working from home than those from Bosnia and Herzegovina (I-J= -0.50746;  $p=0.000$ ), North Macedonia (I-J= -0.36402;  $p=0.000$ ) and Serbia (I-J= -0.62533;  $p=0.000$ ). The respondents from Serbia are less tense and anxious than the respondents from North Macedonia (I-J= 0.26131;  $p=0.009$ ). Relatives and friends supported the respondents in their work from home in very similar percentages, while relatives and friends supported them relatively least in North Macedonia, followed by Montenegro (see Table 2). The respondents from BiH were significantly more supported in working from home than the respondents in North Macedonia and Montenegro, and also the respondents from Serbia compared to Macedonia and Montenegro ( $F=10.718$ ;  $p=0.000$ ). Relatives and friends were supportive significantly more in Bosnia and Herzegovina than in North Macedonia (I-J= 0.4053;  $p=0.000$ ) and Montenegro (I-J= 0.2189;  $p=0.033$ ). They were also more supportive more in Serbia than in North Macedonia (I-J= 0.4495;  $p=0.000$ ) and Montenegro (I-J= 0.2631;  $p=0.003$ ). Bosnia and Herzegovina and Serbia do not differ significantly from each other.

Finally, family and friends of our respondents do not interfere with their work from home and allow them to fully devote themselves to work in large percentages ranging from slightly more than two fifths (North Macedonia) to over three quarters (Serbia, see Table 1). In this respect, Serbia and Bosnia and Herzegovina are the most similar. However, the differences are still statistically significant ( $F=7.138$ ;  $p=0.000$ ). Family, friends and neighbors hinder the respondents from Serbia from fully dedicating themselves to work at home than the respondents from North Macedonia (I-J= 0.4342;  $p=0.000$ ) and from Montenegro (I-J= 0.3029;  $p=0.003$ ). The respondents from Bosnia and Herzegovina are also less

disturbed than those from Macedonia ( $I-J=0.025$ ,  $p=0.025$ ). No statistically significant differences were found between Serbia and Bosnia and Herzegovina.

## STRUCTURE OF THE SCALE OF PSYCHOSOCIAL ADAPTABILITY TO BUSINESS FROM HOME

The first goal of our research was to examine whether the 13 items on the Scale are structured in such a way that they represent special dimensions of the psychosocial problems of respondents who work from home. We subjected the items to exploratory factor analysis with Varimax rotation. Due to the limited space in this study, only the most important results of factor analysis are presented. First, Cronbach's Alpha is at a good level and is 0.884. All utilities are generally high and only the answers to the question about engaging in sports and physical activities have the low saturations (probably due to the fact that a solid percentage of people are not physically active at all). The scale has good psychometric properties and is suitable for factorization. Two factors were singled out that together explain 44.508 variances. Conventionally, we singled out those above 0.400 as significant saturations. A clean, easily interpretable structure was obtained. The first, strongest factor explains 32.220 of the variances.

*Table 2. The matrix of rotated components*

	Component	
	1	2
Since I work from home, I feel more tense and anxious	.728	.276
I have trouble separating my work from my personal life	.726	.113
Working from home negatively affected the quantity and quality of sleep.	.723	.222
Since I've been working from home, I pay less attention to my family or my partner.	.708	.265
Since I have started my own business, I have much less time for myself and my hobbies	.616	.157
I would like to have more contact with other people during my work	.483	-.008
I am sure of the stability and future success of the work I am currently doing	.011	.764
My current income is enough to cover all my basic needs.	-.042	.750
The business I'm currently running fulfils me.	.206	.656
My family and close friends are mostly supportive of me in my current job.	.290	.586
While working from home, others (family, friends, neighbours) do not disturb me and I can fully devote myself to work.	.256	.498
Since I work from home, I have more time to spend with friends.	.274	.452
Working from home does not prevent me from taking enough time and motivation to engage in physical activities (exercise/sports).	.120	.418

The following items stood out:

<i>Since I work from home, I feel more tense and anxious.</i>	0.728
<i>I have trouble separating my work from my personal life.</i>	0.726
<i>Working from home negatively affected the quantity and quality of sleep.</i>	0.723
<i>Since I've been working from home, I pay less attention to my family or my partner.</i>	0.708
<i>Since I have started my own business, I have much less time for myself and my hobbies.</i>	0.616
<i>I would like to have more contact with other people during my work.</i>	0.483

**We called this first factor the factor of protective effects of working from home on physical and psychological health and social relationships.** The second factor explained 12.288 of the variances. On it, the following items stood out with saturations above 0.400:

<i>I am sure of the stability and future success of the work I am currently doing.</i>	0.764
<i>My current income is enough to cover all my basic needs.</i>	0.750
<i>The business I'm currently running fulfils me.</i>	0.656
<i>My family and close friends are mostly supportive of me in my current job</i>	0.586
<i>While working from home, others (family, friends, neighbors) do not disturb me and I can fully devote myself to work.</i>	0.498

<i>Since I work from home, I have more time to spend with friends to engage in physical activities (exercise/sports)</i>	0.452
<i>Working from home does not prevent me from taking enough time and motivation.</i>	0.418

**We called the second factor the factor of satisfaction with professional aspirations and social needs.** We were particularly interested in whether there were statistically significant differences in factors among countries. To that end, we performed ANOVA by the factor scores and in both cases, differences were found – for the first factor ( $F=22.924$ ;  $p=0.000$ ) and for the second factor ( $F=2.905$ ;  $p=0.034$ ). According to the first factor, the respondents from Montenegro, due to working from home, are significantly more exposed to stressful effects on mental and physical health than the respondents from *Bosnia and Herzegovina* ( $I-J= -0.55725326$ ;  $p=0.000$ ) and North Macedonia ( $I-J= -0.52736686$ ;  $p=0.000$ ) and Serbia ( $I-J= -0.68283202$ ;  $p=0.000$ ). According to the second factor, the respondents from North Macedonia are significantly less satisfied with working from home and fulfilling the needs that arise from such work than the respondents from Montenegro ( $I-J= -0.25974146$ ;  $p=0.008$ ) and Bosnia and Herzegovina ( $I-J= -0.23027956$ ;  $p=0.018$ ) while they are not significantly different from Serbia.

## SOCIAL-PSYCHOLOGICAL PROFILES FOR EACH COUNTRY

### *Bosnia and Herzegovina*

The respondents from Bosnia and Herzegovina are the youngest population by age. They have a significantly lower educational level than all the others. According to the type of activity, significantly more than all others work in the IT sector as developers. According to a series of features, the respondents from Bosnia and Herzegovina are relatively well adapted to work from home; they have enough time for their leisure activities and hobbies, although they sometimes lack time for physical activities. They have no problems with the quantity and quality of sleep. Because of working from home, they do not neglect their family, partner, but to some extent they neglect their friends. The work they do from home fulfills them. They maintain good contacts with other people while working from home and successfully separate their work from home from their personal life. They do not feel tense and anxious while working from home, and relatives and friends support and help them in working from home.

### *Montenegro*

As in other countries, gender differences have not been established, and the respondents from Montenegro are on average relatively younger, following Bosnia and Herzegovina. In contrast to Bosnia and Herzegovina, they are significantly more likely to have high and university education because close to half have a university degree. The type of activity in working from home is mostly trade and education (almost half of the total number). They work from home relatively the longest. In many respects, respondents from Montenegro who work from home are specific [27]. Since they work from home, they have much less time for their activities and hobbies, including engaging in sports and recreational activities, they have shorter and poorer quality sleep, and they pay less attention to their family and partner than everyone else, and they also have a little less time for friends. However, they are more satisfied with their jobs than the respondents from North Macedonia. They have more trouble separating their work from home from their private life than everyone else, but they also want social contact with others while working from home less than everyone else. Due to working from home, they are more tense and anxious than the respondents from the other countries, and their relatives and friends support and help them in their work from home less than the majority of respondents from other countries. The respondents from Montenegro in working from home are faced with more problems than all the others, which is why they show a series of inconsistencies in psychosocial behavior, including confusion.

## *North Macedonia*

In addition to the fact that there are no significant differences according to gender, the respondents from North Macedonia come right after Serbia in terms of average age. In terms of level of education, they are second, right after Montenegro, with almost a third of those who have a high school education. Like the respondents in Montenegro, they work in trade and education in similar percentages. In terms of length of work from home, they are second, right after Montenegro.

Despite these similarities in social profiles, more differences than similarities with Montenegro were found in psychosocial adjustment. The similarity with the respondents from Montenegro is that, due to working from home, they do not have the desired time for sports and recreational activities. In particular, it should be pointed out that the respondents from North Macedonia were the most dissatisfied with the work they currently do from home, although in this respect the differences between the countries do not reach the level of statistical significance. Probably as a result of dissatisfaction with their current job, they are the most skeptical about the prospects of the job they are currently working in the future. They are significantly less tense and anxious about the work they do from home than the respondents from Montenegro. However, following Montenegro, they are still the most tense and anxious, and those differences with Serbia reach the level of statistical significance.

The respondents from North Macedonia, as well as from Montenegro, are less supported by family, relatives and friends and are more hindered in doing work from home than in Serbia and Bosnia and Herzegovina. It is known that the more educated have a slightly more negative perception of working from home than the less educated [26]. It is hard to say whether the more educated both in Montenegro and North Macedonia are more inclined to perceive relatives and friends more negatively, or do relatives and friends really help them less and hinder them more in their work from home.

The respondents from North Macedonia differ significantly from those from Montenegro when they work from home in that:

- they have more time for various activities and hobbies.
- they have a little more time to engage in sports and recreational activities.
- they have longer and better-quality sleep.
- while working from home they pay more attention to their family and friends.
- they more successfully separate business from private life.
- they socialize more while working from home with other people.
- they are less tense and anxious while working from home.

## *Serbia*

The respondents from Serbia are on average the oldest. In terms of educational structure, they are very similar to those from Macedonia, and in terms of higher education, to the respondents from Bosnia and Herzegovina and North Macedonia. They have significantly fewer highly educated people who work from home than Montenegro, and more than Bosnia and Herzegovina. They are similar to Montenegro in terms of the length of working from home.

In all the previously mentioned aspects, Serbia is consistently different from Montenegro, and in all others, it is similar to North Macedonia, with the fact that they are significantly more satisfied with the work they currently do from home and look more optimistically at the future of that work and that they have more help and support from friends. On the whole, the respondents from Serbia provide a relatively most optimistic picture of working from home and seem to be the best psychosocially adapted to that work.

## **DISCUSSION**

The most significant and numerous differences are between those who work from home in Montenegro and the others, especially those in Serbia and Bosnia and Herzegovina. They are the least optimistic about working at home and 'the gig' economy; they have more psychosocial problems than all the others, they don't have enough free time for recreational activities, and they also complain about excessive work and the inability to separate work from private life. In addition, they are worse connected

to primary groups while working from home than the respondents from the other countries researched. Despite this, they believe that informal contacts can contribute the most to a successful business from home. They try to further distance themselves from the primary groups while working, and at the same time they are frustrated by this. Because of all this, the respondents from Montenegro in working from home are faced with more problems than all others, which is why they show a series of inconsistencies in psychosocial behavior, and even confusion. The lack of development and mismatch of economic activities, the relatively low level of consumerism, especially at the time of the Covid 19 pandemic, should be considered as possible factors. Almost a third is engaged in online trade. Along with the very unfavorable economic situation, one should not lose sight of the turbulent political context, which makes the otherwise confused social situation even more complicated. However, it seems that the most significant factor is the feeling of frustration because they are doing jobs that are often significantly below their educational level, which is why relatives and friends have an ambivalent and even dismissive attitude towards them.

According to some psychosocial patterns of behavior, the respondents from North Macedonia are the most similar to them. In terms of level of education and type of activity, they are the most similar to the respondents from Montenegro. They are also similar to them in terms of dissatisfaction with current work from home, especially due to the demotivation and routinization of work given their high school education and because of this frustration, as in Montenegro. Due to current dissatisfaction, they are not too optimistic about working from home or the "gig" economy [27,28]. Although they have fewer psychosocial problems due to working from home, in this respect they are more similar to the respondents from Montenegro than to those from BiH and Serbia. All these aspects of similarity with Montenegro at the same time significantly differentiate them from Bosnia and Herzegovina and Serbia.

Bosnia and Herzegovina and Serbia generally differ the most from Montenegro and Macedonia. According to numerous features, the respondents from Bosnia and Herzegovina are the opposite of the respondents from Montenegro. Unlike the respondents from Montenegro, they are the youngest, with the lowest education and mostly employed in the IT sector. They have no psychosocial problems, they have a good balance between work and private life, and they have the support of family and friends in their work. They are satisfied with their work and income and maintain good social communication while working from home. They are optimistic about their job prospects. They strive to jealously preserve all this social and cultural capital, and therefore for the success of their work, the most important thing for them is to preserve the boundaries between business and private life, for which they need flexible working hours. It is obvious that the respondents from Bosnia and Herzegovina are well adapted to working from home. In our opinion, several factors are important for this adaptation. First, we are talking about a young population that is highly motivated for work because they are involved in professional life relatively early. Second, they are above average motivated because they are over proportionally represented in the IT sector. The mere fact that their education is below average does not diminish it, but probably favors their above-average motivation for the IT sector and programming because they obviously acquired knowledge and skills in those areas outside the usual institutional framework. In this regard, this population is particularly interesting for monitoring the possible directions of development of working from home, partly outside the usual institutional frameworks, given the rather pronounced skepticism that the improvement and development of freelancing is possible mainly or only in institutional educational frameworks. [29].

Although the respondents from Serbia have some formal similarities with those from Montenegro (in terms of length of service) and North Macedonia (in terms of education), they differ significantly from the respondents from Montenegro in a number of other characteristics, in which they are more similar to the respondents from Bosnia and Herzegovina. They have no pronounced psychosocial problems. They are satisfied with working from home and are optimistic about the future of work. Like the respondents from Bosnia and Herzegovina, they maintain good social ties with primary groups and the closest social environment to which they eventually turn for help due to business problems, which they generally do not have.

The respondents in four countries show a significant degree of satisfaction with working at (from) home and psychosocial adjustment, with certain exceptions of those who work at (from) home in Montenegro. In this, they are similar to the previous finding [9,10,11,12,13,14,16]. However, one gets the impression that our respondents report a more optimistic picture than it actually is, especially when one considers the poor social protection by state authorities, especially in Serbia. Regardless of

the fact that certain groups are frustrated by working at jobs that are below their qualification level, they still feel privileged due to professional autonomy, higher employment and better incomes. Montenegro is somewhat of an exception for reasons that were discussed earlier.

The results of the factor analysis generally confirm the findings of the item analysis. However, they show that the picture is even more positive than the analysis of individual claims shows, and particularly than the results of the series of studies mentioned so far show, especially when it comes to the first factor.

## CONCLUSION

The results of this research showed that a similar sociocultural context can have a lot of different psychosocial implications for successful performance of business from home. While in Serbia, BiH, and in part and northern Macedonia it has had a positive role because traditional forms of socialism and patriarchal solidarity influenced a business-free psychosocial climate, in Montenegro, the protective traditional patterns were muted by strong collective narcissism, as a kind of the reverse of the same or similar sociocultural context.

Finally, the results of this research showed that a similar sociocultural context can affect both the positive and negative psychosocial environment for running a business from home, depending on the specific sociopsychological factors operating in that context, which was not the subject of special research. No less important is the knowledge, supported by the results of this research, that, contrary to expectations, good psychosocial conditions for running a business from home can occur in less developed societies with anachronistic cultural patterns. Moreover, these patterns can have a more positive psychosocial effect on the successful conduct of business at home than those established in modern developed societies, whose positive effect is not questioned.

In conclusion, it should be especially emphasized that socio-economic crisis for decades has drastically shaken all these anachronistic patterns of male domination, because the women from the lower and middle layers of Montenegrin society showed far more success in overcoming the most difficult socio-economic consequences of this crisis, from the 90s to date. All the negative phenomena were intensified by a chronic political crisis, in which all transitional social processes were blocked and whose outcome remains uncertain.

## REFERENCES

- [1] Radović-Marković, M., Stevanović, M., Milojević, N., (2021). Remote Working in Terms of Covid 19. *International journal of entrepreneurship*, Cullowhee, NC: Academy of Entrepreneurship, p. 1-6. ISSN 1099-9264. Link: [remote-working-in-terms-of-covid-19.pdf](https://doi.org/10.1006/jvbe.2000.1774) (abacademies.org)
- [2] Allen, T. (2001). Family-supportive Work Environments: The Role of Organizational Perceptions, *Journal of Vocational Behavior*, 58(3), 414-435. <https://doi.org/10.1006/jvbe.2000.1774>
- [3] Baltes, B. B., Briggs, T. E., Huff, J. W., Wright, J. A., & Neuman, G. A. (1999). Flexible and compressed workweek schedules: A meta-analysis of their effects on work-related criteria. *Journal of Applied Psychology*, 84(4), 496–513. <https://doi.org/10.1037/0021-9010.84.4.496>
- [4] Bloom, N., Liang, J., Roberts, J., and Ying, Z. J. (2015). Does working from home work? Evidence from a Chinese experiment. *The Quarterly journal of economics*, 130(1), 165-218.
- [5] Greenhaus, J. H., & Powell, G. N. (2006). When Work and Family Are Allies: A Theory of Work-Family Enrichment. *The Academy of Management Review*, 31(1), 72–92. <http://www.jstor.org/stable/20159186>
- [6] Gajendran, R. S., & Harrison, D. A. (2007). The good, the bad, and the unknown about telecommuting: meta-analysis of psychological mediators and individual consequences. *The Journal of applied psychology*, 92(6), 1524–1541. <https://doi.org/10.1037/0021-9010.92.6.1524>
- [7] Thomas, L. T., & Ganster, D. C. (1995). Impact of family-supportive work variables on work-family conflict and strain: A control perspective. *Journal of Applied Psychology*, 80(1), 6–15. <https://doi.org/10.1037/0021-9010.80.1.6>
- [8] Grant, C.A., Wallace, L.M. and Spurgeon, P.C. (2013), An exploration of the psychological factors affecting remote e-worker's job effectiveness, well-being and work-life balance, *Employee Relations*, 35(5), 527-546. <https://doi.org/10.1108/ER-08-2012-0059>
- [9] Anderson, A. J., Kaplan, S. A., & Vega, R. P. (2015). The impact of telework on emotional experience: When, and for whom, does telework improve daily affective well-being? *European Journal of Work and Organizational Psychology*, 24(6), 882-897.

- [10] Lewis, S., & Cooper, C. (2005). *Work-life integration: Case studies of organizational change*. John Wiley & Sons.
- [11] Madsen, S.R. (2011) The Benefits, Challenges, and Implication of Teleworking: A Literature Review. *Journal of Culture and Religion*, 1(1): 148-158.
- [12] Nilles, J.M. (2007). Editorial: the future of e-work, *The Journal of E-Working*, 1(1), 1- 12.
- [13] Noonan, Mary & Glass, Jennifer. (2012). The Hard Truth About Telecommuting. *Monthly labor review / U.S. Department of Labor, Bureau of Labor Statistics*. 135.
- [14] Twentyman, J. (2010), "The flexible workforce", *The Times*, 21 September, 1-16.
- [15] Baruch, Y. (2000), Teleworking: benefits and pitfalls as perceived by professionals and managers. *New Technology, Work and Employment*, 15: 34-49. <https://doi.org/10.1111/1468-005X.00063>
- [16] Wheatley, D. (2017). Employee satisfaction and use of flexible working arrangements. *Work, Employment and Society*, 31(4), 567–585. <https://doi.org/10.1177/0950017016631447>
- [17] Lautsch, B. A., Kossek, E. E., & Eaton, S. C. (2009). Supervisory approaches and paradoxes in managing telecommuting implementation. *Human Relations*, 62(6), 795-827.
- [18] Kowalski, K.B. and Swanson, J.A. (2005). Critical success factors in developing teleworking programs. *Benchmarking: An International Journal*, 12, 236-249.
- [19] Hayman, J. (2010). Flexible work schedules and employee well-being. *New Zealand Journal of Employment Relations*, 35(2), 76-87.
- [20] Mann, S., & Holdsworth, L. (2003). The psychological impact of teleworking: stress, emotions and health. *New Technology, Work and Employment*, 18(3), 196-211.
- [21] Baker, E., Avery, G. C., & Crawford, J. D. (2007). Satisfaction and perceived productivity when professionals work from home. *Research & Practice in Human Resource Management*.
- [22] Question and Retain (2020) "New research reveals psychological impact of working from home during Covid-19 lockdown", May 26, 2020. <https://www.questionandretain.co.uk/2020/05/26/psychological-impact-of-working-from-home>
- [23] Mapes, M. (2019). "How to Avoid the Negative Psychological Effects of Remote Work", Inc.com, October 7, 2019. <https://www.inc.com/melissa-mapes/how-to-avoid-negative-psychological-effects-of-remote-work.html>, Html accessed 16/04/2023.
- [24] Sang, K., Gyi, D., & Haslam, C. (2010). Musculoskeletal symptoms in pharmaceutical sales representatives. *Occupational medicine (Oxford, England)*, 60(2), 108–114. <https://doi.org/10.1093/occmed/kqp145>
- [25] Radović-Marković, M., Jovanović, J., (2021). Impact of COVID-19 on Working from Home in Serbia: Possibilities and Consequences, U: Vidaković (ur.) Lovrinović (ur.). *Macroeconomic Responses to the COVID-19 Pandemic-Policies from Southeast Europe*, London, Velika Britanija, Springer, str. 345-347. ISBN 978-3-030-75443-3. Link: Impact of COVID-19 on Working from Home in Serbia: Possibilities and Consequences | SpringerLink
- [26] Radović-Marković, M. (2018). Female entrepreneurship opportunity: Home-based genealogy business. *Journal of Women's Entrepreneurship and Education*, (3/4), 20-33.
- [27] Djukanovic, B., Macanovic, N., Radović-Marković, M. (2021). Leisure activities of the population in Montenegro, *International review*, No.3-4, str.105-119.
- [28] Dukanović, B., Chou Zanadu, L., & Petrušić, I. (2023). Differences In Resilience to Problems of Work at Home In Four Countries Of The Western Balkans. *Journal of Entrepreneurship and Business Resilience*, 6(1), 67–78. Retrieved from <https://jebr.fimek.edu.rs/index.php/jebr/article/view/96>
- [29] Djukanović, B., Krivokapić, N., Banović, S., & Čustović, E. (2022). The Impact of Pandemia Covid-19 On the Resilience of Individuals and Society: Socio-Psychological Aspects. *Journal of Entrepreneurship and Business Resilience*, 5(1), 13–24. Retrieved from <https://jebr.fimek.edu.rs/index.php/jebr/article/view/6>
- [30] Vučeković, M., Radović-Marković, M., Đukanović, B., Duković, S., Dragojević, A. (2021). Gender Aspects of Working from Home in Serbia, *Journal of Women's Entrepreneurship and Education*, Issue 1-2, str. 18-36.

### Article history:

Received 10 November 2023

Accepted 14 December 2023

# THE ROLE OF THE LEADER IN TEAMWORK

ARSENIJEVIĆ Olja<sup>1</sup>, KASTRATOVIĆ Edita<sup>2</sup>, PODBREGAR Iztok<sup>3</sup>

<sup>1</sup>Institut for Serbian Culture Pristina - Leposavic, (SERBIA)

<sup>2</sup>Faculty of Business Economics and Entrepreneurship, Belgrade, (SERBIA)

<sup>3</sup>Faculty of Organizational Science, University of Maribor, Kranj, (SLOVENIA)

E-mail: [arsenijevicolja@gmail.com](mailto:arsenijevicolja@gmail.com); [kastratovice@yahoo.com](mailto:kastratovice@yahoo.com);

[iztok.podbregar@um.si](mailto:iztok.podbregar@um.si)

## ABSTRACT

*The subject of research in the paper is the competence, way, and quality of team management and leadership styles of team leaders from the point of view of team productivity.*

*The research aims to determine the competence and way of team management and the influence of the team leader's leadership styles (directive, participative, and supportive) on increasing team productivity. In order to achieve the set goal of the research, the paper started with the following hypotheses: General hypothesis (H0): The assumption is that leaders significantly influence teams' productivity in Serbian companies. Specific hypotheses in the paper we define as:*

*H1. The assumption is that the team leaders in a particular organization are competent to perform the tasks. H2. The assumption is that managing the team is a function of creating a favorable social climate. H3. The assumption is that certain leadership styles significantly impact increasing team productivity. H4. The assumption is that improving leadership style and building leadership skills increase team productivity. H5: The assumption is that there are significant differences between respondents in assessing the influence of leadership style on the productivity of teamwork, considering their sociodemographic and status characteristics.*

*The authors used descriptive, inductive, deduction, and content analysis methods in the paper and surveying as a technique. The authors processed statistical data using descriptive statistics (frequency and percentages), analysis of variance, and t-tests for independent and dependent samples. Also, the authors used the F-test and Levene's test.*

*All five hypotheses were confirmed after examining the hypotheses from which the research started.*

**Keywords:** leadership, teamwork, productivity, team management, team leadership styles.

*The article was created as a result of research work at the Institute for Serbian Culture, Priština-Leposavić, within the framework of the agreement concluded with the Ministry of Science, Technological Development and Innovation of the Republic of Serbia No.: 451-03-47/2023-01/200020 dated February 3, 2023.*

**JEL:** J24

**DOI:** 10.5937/intrev2304110A

**UDC:** 005.332:005.322

005.322:316.46

005.64

**COBISS.SR-ID** 133916169

## INTRODUCTION

Economic indicators, the rapid development of technologies, the environment, globalization, the division of labor, and the increase and expansion of knowledge have contributed to a new approach based on leadership. Modern times are dynamic and conditioned by daily changes that leaders must follow to achieve organizational goals and objectives. Also, teamwork leadership depends a lot on the roles divided in the team and their meaning, which is incorporated into the organizational structure. The ever-increasing speed of changes conditions the importance of leaders and roles in teamwork, which are becoming increasingly important in the proper functioning of organizations.

Management style is formed depending on the leader's personality traits, knowledge, experiences, goals, and assumptions about the people he works with. Leaders should possess certain personality traits that create the prerequisites for a desirable level of social behavior and influence employees in an interactional relationship. Through joint work and functioning, leaders and employees realize planned ideas and achieve set goals, which leads to an improvement in the status and position of the organization.

Great importance is permanently attached to the study of personality traits of leaders. Very rarely have research efforts been made to examine the influence of these traits on management style. Previous research on leaders' management styles in teamwork was related to inquiries that contribute the most to the organization's efficiency and suit the employees. Leaders' different personality traits make them stand out because of how they treat others. It is directly related to how people are managed, considering that management is an interpersonal process, and it is possible to explain and predict their management style based on the knowledge of the implicit theories of the leader's personality.

The interest in examining the role of the leader's personality in teamwork and the influence of the leader's personality traits on the choice of human resource management style arose from the belief that the previous approach to the research of leaders in teamwork did not sufficiently respect these requirements, neither in theoretical nor in methodological terms. Efforts have rarely been made to examine the influence of subjective factors, especially the leader's personality traits, on management style in teamwork. The business of modern organizations is increasingly based on pervasive assets, which can create competitive (market) advantages and added value. Therefore, developed countries base their development strategy on expanding and strengthening intellectual capital as the central resource providing market-commercial advantages in production.

## TEAM LEADERSHIP

Teams provide innovative decision-making based on all members' collective knowledge and experience. In order to channel the team's energy in the right way, effective team leaders must know how to convey information, gain the trust of their employees, give up a certain amount of authority in favor of team spirit, and recognize the moment when it is necessary to intervene [1]. The team leader needs to develop the ability to recognize when the team needs to be left alone or when it needs to be actively involved to keep things in balance.

In this way, the team takes responsibility for the quality of the work done. It is important to note that empowerment represents the delegation of responsibility to an individual or, in this case, to a team and implies autonomy, trust, and encouragement to make decisions necessary for successful work performance. A logical sequence of thoughts leads us to conclude that team building is a necessary method that aims to help the team be more effective in such a way that it improves internal communication and develops the skills necessary to solve problems [2].

In defining team leadership, there is an understanding that the effectiveness of leadership does not depend on an individual act but on the process of team action. Leadership is not dominance but the ability to persuade people to work towards a common goal, supported by a network of individuals, followers, leaders, and shared responsibility [3].

For a team to succeed, its leader must possess different skills. They will depend on the type of team and the established goals. The team model contains three components as prerequisites for effective team functioning [4]: skills, achievements and results, and responsibilities, which show whether teams are adequately designed in the sense that all necessary skills are represented, that relationships of trust are built, and that members are engaged, dedicated, reliable, and responsible.

Effective teams have clear goals to achieve. Members know what to expect of them, how to achieve those goals, and are committed to the team's goals. The team's goals must be functionally related to the organization's overall goals or the part in which the team is. The organization's general goals should transform into specific and measurable team goals. They must lead to real change in the organization. They have to be challenging but also achievable [5].

A leader's style describes the leader's actions, such as visioning, coaching, collaboration, and consensus. There are different types of leadership styles in work environments. However, only some styles are suitable for some. The organization's culture and goals determine which leadership style best suits the company. Building an effective leadership style can develop an effective leader [6]. There are six basic leadership styles: coercive/autocratic, affiliative, participatory/democratic, charismatic, designer, and coach [5].

Leadership and teamwork are the basis of a dynamic fabric in an organization. In an organizational environment, one cannot exist without the other. Leadership carries many different connotations and is often seen as a synonym for other, equally complex concepts - such as power, authority, management, administration, and supervision. Leadership in an organization involves two groups of people: leaders and employees. By being willing to accept the leader's guidelines and instructions, the group members allow the leader's status to be defined, as well as the leadership process itself. If there were no other people, all leadership qualities of managers would be insignificant [5].

Both leadership and teamwork are driven by critical soft skills that must be applied carefully and balanced. This balance between leadership and teamwork is imperative to ensure that both are performed not only in tandem - as two sides of the same coin - but also symbiotically as they draw inspiration for success from each other [6].

Each form of team has its own subjective and objective advantages and disadvantages. The impact of capable new-age teams is summed up in a concise and challenging vision of the team's overall purpose that is clear to all members who participate in it. The hallmark of a good team is a pervasive sense of support, safety, and trust, where members can rely on each other. One of the main characteristics of teams is diversity of opinion. Problems should be seen from different angles if we want to create the best solutions. However, if diversity is allowed and encouraged, everyone may look at the problem similarly, and better solutions will emerge [7].

In a work environment where the team composition constantly changes, the emphasis must be on developing the individual skills needed for effective teamwork. In this case, the individual tries to develop skills and talents, from individual skills to those needed for effective functioning in a team (or several teams). In teams where membership is static—typical of leadership teams—how members are connected can be a significant asset or hindrance to team performance [8]. If some team members leave and others come, the team dynamics can change drastically. Except for the top management team, the ability of individuals to influence organizational culture is minimal. One of the key goals of team building consultants is to change the behaviors and attitudes prevalent in the organization to ensure that new "different" members begin to behave according to the existing culture. Focusing on teamwork can help cut expenses, accelerate deadlines, and increase satisfaction with completed tasks. Because of all this, the company becomes competitive, one of the most strategically important factors for success in the market [9].

## **FACTORS AFFECTING TEAMWORK EFFICIENCY**

In this context, work is understood as that which people perform, so they are the decisive factor on which the quantity and quality of work, i.e., its performance, depends. Human resources in the work process can be analyzed from various aspects: sociological, psychological, medical, legal, ethical, etc. Economic analysis investigates human resources from an economic aspect, i.e., from the aspect of work efficiency. The analysis represents the research of the factors that determine the volume and structure of human resources, as well as the work potential, to determine and achieve the optimal volume and structure, that is, optimal work efficiency.

Teamwork is the most widespread form of performing complex professional tasks, the realization of which requires either knowledge from different professional fields or specialized knowledge from the same or similar fields. The purpose of creating teams and teamwork is to integrate the knowledge and experience of team members when solving the same problem. Teamwork is necessary when performing

complex tasks that require knowledge from different fields and professions. Successful teams give more than any one individual would give. The following contribute to the functionality of a team: the mutual connection of members, quality of relations among members, quality of communication and mutual adjustment, method of conflict resolution, agreement and compliance with agreements, agreed setting and compliance with rules, the emancipation of all members; good energy potentials of all members; trust and sharing of responsibilities; and shared vision [10].

As a complex process, motivation requires the participation of at least two parties: the one who motivates and the one who is motivated. Good motivation is crucial in the workplace which is necessary for the successful functioning and operation of the organization. Motivation usually means a system of methods, procedures, and actions that encourage, direct, and reinforce specific behaviors of employees to achieve more significant and favorable work results [10].

Team effectiveness has always been a big part of any company and its success. But as more companies adopt hybrid and remote work structures, leaders need to amp up their team management skills [11].

Everyone has emotional needs at work, but remote workers have some unique challenges. They may struggle with feelings of loneliness and isolation, difficulties communicating and collaborating, and distractions. Without solid team leadership, these challenges hurt team effectiveness, ranging from lack of productivity to burnout. [11], [12].

## EMPIRICAL RESEARCH

The subject of research is interdisciplinary. By its nature, it belongs to the theory and practice of organization, and its research is connected with the achievements of several scientific disciplines and areas (theory of organization, theory of management, theory of personality, and others). The subject of research in the paper is the competence, way, and quality of team management and leadership styles of team leaders from the point of view of team productivity.

The research aims to determine the competence and way of leading the team, as well as the influence of the leadership styles of the team leader (directive, participative, and supportive) on increasing the team's productivity.

The research tasks are to determine the following:

1) Competence and leadership quality of team leaders; 2) Ways of leading team leaders from the point of view of creating a favorable social climate for the team; 3) The influence of specific leadership styles on increasing team productivity; and 4) Determine the impact of improving leadership style and building leadership skills on increasing team productivity.

Research hypotheses

General hypothesis (H0): The assumption is that leaders significantly influence teams' productivity in Serbian companies.

Specific hypotheses:

H1. The assumption is that the team leaders in a particular organization are competent to perform the tasks.

H2. The assumption is that managing the team is a function of creating a favorable social climate.

H3. The assumption is that certain leadership styles significantly impact increasing team productivity.

H4. The assumption is that improving leadership style and building leadership skills increase team productivity.

H5: The assumption is that there are significant differences between respondents in assessing the influence of leadership style on the productivity of teamwork, considering their sociodemographic and status characteristics.

Variables in this research:

The independent variables are the demographic features of the respondents: gender, age, and type of employment. According to gender, respondents were grouped into male and female respondents. According to the years of life, the respondents were classified into the following periods of life: a) from 20 to 30 years, b) from 30 to 40 years, c) from 40 to 50 years old, d) from 50 to 60 years old and d) over 65 years old. Regarding the level of professional education, the respondents were grouped as follows: 1) high school diploma, 2) university degree, 3) master's degree, and 4) Ph.D. By employment sector, respondents were classified into those working in the public sector (1) and in the private sector (2).

Dependent variables include a) competence and efficiency of team leaders (Q2, Q8, and Q10); b) way of managing team leaders in the organization (Q1, Q3, Q4, Q5, Q6, Q7 and Q9); c) team productivity depending on leadership style (Q11, Q12, Q13 and Q14); g) team productivity depending on the team leader's advancement (Q14) and the building of leadership skills (Q15).

In this research, the authors applied a descriptive method, and among the research techniques (procedures), they applied surveying using the Survey Questionnaire as a research instrument. The research was conducted on a sample of 135 respondents. Statistical data processing was performed using descriptive statistics (frequency and percentages), analysis of variance, and t-test for independent and dependent samples. Also, the authors used the F-test and Levene's test.

## PRESENTATION OF RESULTS WITH DISCUSSION

The independent variables are the demographic features of the respondents: gender, age, and type of employment.

*Table 1. Gender of respondents*

Answers	Frequency	Percentage	Cumulative percentage
1. Male	70	51.9	51.9
2. Female	65	48.1	100.0
<b>Total</b>	135	100.0	

*Table 2. Years of age*

Answers	Frequency	Percentage	Cumulative percentage
1. From 20 to 30 years	36	26.7	26.7
2. From 31 to 40 years	44	32.6	59.3
3. From 41 to 50 years	26	19.3	78.5
4 From 50 to 60 yearsa	29	21.5	100.0
<b>Total</b>	135	100.0	

*Table 3. Educational background*

Answers	Frequency	Percentage	Cumulative percentage
1. High school diploma	11	8.1	8.1
2. University degree	55	40.7	48.9
3. Master's degree	30	22.2	71.1
4. Ph. D	39	28.9	100.0
<b>Total</b>	135	100.0	

*Table 4. Distribution of respondents by employment sector*

Sector	Frequency	Percentage	Cumulative percentage
1. Public sector	59	43.7	43.7
2. Private sector	76	56.3	100.0
<b>Total</b>	<b>135</b>	<b>100.0</b>	

Statistical indicators determined here: arithmetic mean and standard deviation, that is, the ranks of these statements according to the height of the arithmetic mean on a scale from "1" to "5", where "5" is the highest agreement with the statement. According to the obtained results, it is noticeable that the statement "In your organization, team leaders issue clear work instructions so that employees know what is expected of them" (AM=3.89) ranks first. Second in rank is the claim that in their organization, "the decision of the team leader is strictly respected regardless of everything" (AM=3.81), and the third in rank is the statement that says that "employees' suggestions are respected and considered by team leaders" (AM=3.74).

According to the values of the standard deviation, it is noticeable that the highest degree of mutual agreement between the respondents with the assertion present in the following: "In your organization,

the most important thing is to respect the team leader's decisions regardless of everything strictly" (SD=1.094), and the lowest degree of agreement occurred with the statement "Team leaders in the organization use their position and the power they possess to help subordinates develop their abilities and skills" (SD=1.248), (Table 5).

**Table 5.** Basic statistical indicators of team leaders' leadership style

	Manifest variables (and indicators) of team leaders' management style	AM	SD	Ranking
Q1	In your organization, team leaders encourage collective loyalty, even at the expense of individual goals.	3.56	1.157	6
Q3	In your organization, team leaders issue clear work instructions so that employees know what is expected of them.	3.89	1.150	1
Q4	In your organization, the team leader takes pride in the individual achievements of the members.	3.78	1.244	4
Q5	Team leaders in an organization use their position and the power they possess to help subordinates develop their abilities and skills.	3.59	1.248	5
Q6	Team leaders appreciate and consider the suggestions of the employees.	3.74	1.228	3
Q7	Employees have the right to set their own team goals.	3.39	1.209	7
Q9	In your organization, employees have to respect the team leader's decision regardless of everything strictly.	3.81	1.094	2

AM= Arithmetic Mean; SD= Standard Deviation.

According to the value of basic statistical indicators (arithmetic means and standard deviations), the productivity of the team and the organization is most affected by the "improvement of the leadership style" (AM=4.59), followed by the "participative behavior" of the team leader in managing the team and organization (AM=4.51). After the participative behavior of the team leader, the most significant effect on increasing the productivity of the team's work is his "supportive behavior" (AM=4.43), and only then "directive behavior" (AM=4.01). According to the respondents, the most negligible impact is achieved by the advancement of team leaders in their skills (AM=3.70). It is interesting to point out that when assessing the impact of this skill on the team's effectiveness, the lowest degree of agreement was among the respondents (SD=1.153), (Table 6).

**Table 6.** Basic statistical indicators of the influence of team leaders' leadership style on team productivity

	Manifest variables (indicators) The influence of team leaders on team performance	AM	SD
Q11	Through directive behavior, that is, by defining roles in the team and structuring activities, leaders directly influence the increase in team productivity.	4.01	1.099
Q12	Team leaders can increase team productivity by engaging in participative behavior, i.e., involving employees in decision-making processes.	4.51	.863
Q13	Team leaders increase team productivity through supportive behavior, such as attention, care, understanding, and respect for employees.	4.43	1.004
Q14	Do you consider that teamwork productivity will increase if team leaders improve their leadership style?	4.59	.776
Q15	Do you consider that in the next three years, team leaders will advance in their skills and thus increase the productivity of organizations?	3.70	1.153

The analysis based on the collected empirical data shows that responsible leaders can establish effective teamwork and improve the organization's intellectual capital.

By using the variance analysis procedure and the t-test, authors determined whether there are differences between individual categories of respondents in assessing the influence of the team management style on its productivity according to the sociodemographic and status characteristics of the respondents (gender, age, education background and type of employment).

Testing the significance of differences between different groups of respondents in assessing the impact of leadership style on team productivity based on their age (from 20 to 30 years old; from 30 to 40 years old, from 40 to 50 years old, and over 50 years old) is shown in table 7. The obtained results show that the F-statistics for all five dependent variables (Q11, Q12, Q13, Q14, and Q15), which amount to 2.450, 0.314, 0.489, 0.796, and 1.465, are not statistically significant at the confidence level  $p \leq 0.05$ . Accordingly, we can conclude that all five hypotheses have been confirmed, i.e., there are no significant differences between groups of respondents of different ages in assessing the influence of leadership style on increasing teamwork productivity.

**Table 7.** Testing the significance of differences in the assessment of teamwork productivity between groups of respondents of different ages

		The sum of the squared deviations	The number of degrees of freedom	Variances between and within groups	F-statistic	Sig.*
Q11	Between groups	8.606	3	2.869	2.450	.066
	Within groups	153.364	131	1.171		
	Total	161.970	134			
Q12	Between groups	.712	3	.237	.314	.815
	Within groups	99.021	131	.756		
	Total	99.733	134			
Q13	Between groups	1.497	3	.499	.489	.690
	Within groups	133.585	131	1.020		
	Total	135.081	134			
Q14	Between groups	1.446	3	.482	.796	.498
	Within groups	79.324	131	.606		
	Total	80.770	134			
Q15	Between groups	5.784	3	1.928	1.465	.227
	Within groups	172.364	131	1.316		
	Total	178.148	134			

\* **Sig. – p** → The two-tailed test value associated with the null hypothesis that the two groups have the same variance.

Testing the significance of differences in the assessment of teamwork productivity between groups of respondents with different educational backgrounds (high school diploma, university degree, master's degree, Ph. D) is shown in Table 8. The results of the variance analysis show that all five F-statistics, which amount to 2.118, 0.832, 0.069, 1.055, and 2.338, are not statistically significant at the confidence level  $p \leq 0.05$ . It can be concluded that all five null hypotheses are confirmed, i.e., that there are no

significant differences between groups of respondents with different educational backgrounds in assessing the influence of leadership style on increasing teamwork productivity.

**Table 8.** *Testing the significance of differences in the assessment of teamwork productivity between groups of respondents of different educational backgrounds*

Dependent variables		The sum of the squared deviations	The number of degrees of freedom	Variances between and within groups	F-statistic	Sig.
Q11	Between groups	7.491	3	2.497	2.118	.101
	Within groups	154.479	131	1.179		
	Total	161.970	134			
Q12	Between groups	1.865	3	.622	.832	.478
	Within groups	97.868	131	.747		
	Total	99.733	134			
Q13	Between groups	.214	3	.071	.069	.976
	Within groups	134.867	131	1.030		
	Total	135.081	134			
Q14	Between groups	1.905	3	.635	1.055	.371
	Within groups	78.865	131	.602		
	Total	80.770	134			
Q15	Between groups	9.053	3	3.018	2.338	.077
	Within groups	169.096	131	1.291		
	Total	178.148	134			

The significance of differences between arithmetic means of subjects of different genders was tested using the t-test for independent and dependent samples. At the same time, one of the variables defined the gender of the respondent (male and female), and the other variable was one of five dependent variables of the success of team functioning depending on the leadership style (directive, participative, and supportive), style building and leadership skills.

The significance of the differences between the two variables was tested using Levene's test, which examines the homogeneity of variances of groups, and then using the t-test for unequal samples to test the null hypothesis (H<sub>0</sub>) about the existence of a difference between the two variables for a certain number of degrees of freedom (df), and the level of significance (p). Thus, five null hypotheses were tested that there is a difference between the sexes of the respondents in assessing the influence of the leadership style of the team leader on the effectiveness of the team and the organization.

Based on the insight into the values of Levene's test of equality of variances of groups concerning one of the five dependent variables (Q11, Q12, Q13, Q14, and Q15), which are shown in Table 9, it can be observed that the variances of the groups are not homogeneous in terms of the variability of the mentioned dependent variables, i.e., Levene's test's significance was not established at the  $p \leq 0.05$  level. Consequently, the null hypothesis (H<sub>0</sub>) is accepted, and it is concluded that there are no statistically significant differences among the examined variables. Therefore, the respondents' assessments of the influence of certain management styles of team leaders on the efficiency of the teams' work do not differ from each other in terms of the different sexes of the respondents.

**Table 9. Test for independent samples**  
(Gender of respondents and assessment of teamwork efficiency)

	Levene's test for homogeneity of variances		t-test for Equality of Means						
	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
								Lower	Upper
Q11	.207	.650	1.566	130.436	.120	.296	.189	-.078	.669
Q12	.084	.773	.044	131.119	.965	.007	.149	-.289	.302
Q13	1.715	.193	.327	124.597	.744	.057	.175	-.289	.403
Q14	.555	.457	-.877	130.798	.382	-.118	.134	-.383	.148
Q15	.290	.591	-.633	129.474	.528	-.126	.200	-.522	.269

-Equal variances not assumed

When testing the significance of the difference between the arithmetic means of two variables using the t-test for independent and dependent samples, where one of the variables is defined by the respondent's employment in a specific sector (public and private) and the dependent variable is defined by one of the five dependent variables (Q11, Q12, Q13, Q14, and Q15), the results are shown in Table 10. Based on the insight into the value of Levene's test of equality of variances of the groups regarding the type of employment of the respondents (social sector and private sector), it is noticeable that the variances of the groups are homogeneous regarding the assessment of the following variable: Q15: Do you consider that in the next three years, team leaders will advance in their skills and thus increase the productivity of organizations? (F=5.340; p=0.022). In the other evaluations of respondents on the effectiveness of specific leadership styles (Q11, Q12, Q13, and Q14), the significance of Levene's test for the level of significance  $p \leq 0.05$  was not determined.

For the variable where a difference was found in Levene's homogeneity test, the T-statistic is -2.632 and is significant at the 0.01 confidence level, suggesting that the appropriate null hypothesis can be rejected. Based on this, it can be concluded that among the respondents who are employed in different sectors (public and private), there are significant differences in the arithmetic mean of the assessment of the impact of the advancement of team leaders in their skills on increasing the productivity of teams and organizations.

**Table 10. Independent samples t-test**  
(gender of respondents and assessment of teamwork efficiency)

	Levene's test for homogeneity of variances		t-test for Equality of Means						
	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
								Lower	Upper
Q11	4.965	.028	-.898	106.754	.371	-.177	.197	-.567	.214
Q12	1.688	.196	-.815	111.772	.417	-.125	.153	-.429	.179
Q13	.073	.788	-.572	119.951	.569	-.101	.176	-.450	.248
Q14	.311	.578	-.557	119.097	.579	-.076	.137	-.346	.194
Q15	5.340	.022	-2.632	111.072	.010	-.527	.200	-.925	-.130

- Equal variances not assumed

## CONCLUSION

The world is changing faster than we can imagine. Developing only a few leaders in charge of certain things is no longer appropriate. Individual development must be excluded by the intentional development of collective consciousness, in which people's autonomy and shared culture are respected and improved. A leadership culture is a ripe foundation for this advancement. The world is hungry for positive changes that simultaneously lift up individuals, groups, organizations, communities, and societies. Pick up development tools, play with them, invent new ones, use them, share them, and teach them. Everyone everywhere is in this together.

The paper explores modern approaches to leadership and the specifics of leaders in teamwork. The conclusion is that leadership aims to influence employees so that they do their best and achieve the best results.

In accordance with the methodology of scientific research activities, this paper represents the sublimation of conclusions obtained through research and analysis of the given problem. At the same time, it was concluded that leadership is a significant factor in teamwork and comes from leadership ability, not power and authority.

Leadership represents a key segment in teamwork to achieve strategic goals and directions in which the company should move. At the same time, leadership must have the primary function in teamwork and should be the bearer of changes in development and cooperation between employees.

When potentiating the conditions of a successful leader in teamwork, the factor that represents leadership as a process through which influence is exerted on employees should be emphasized, using the right (genuine) elements of influence that will contribute to and influence employees. All this will cause maximum engagement of employees in the direction of achieving the set goals.

Every company has its own culture, representing the sum of values, beliefs, and expectations applied in decision-making by leaders and managers. Also, it can be defined as invested values, expectations, beliefs, and norms acquired when one becomes part of the team or through working in the company over time in defining the company's culture.

However, in order to review leadership abilities, certain prerequisites are necessary that must be fulfilled by the person in order to be a high-performance leader whose influence is revised (improved) towards employees and contributes to the achievement of goals both in groups and in teamwork (the company in the whole).

Leaders must be proactive, flexible, and innovative in everything and committed to quality, which can be decisive. Leaders need to understand the role of innovation and change, the importance of the environment, and improve the same. Teams must have quality leaders and a workforce to keep up with the competition. They accept new ideas and quickly adapt to new business conditions. Responsible leadership plays a vital role in turning employees' essential knowledge into the organization's intellectual capital. The paper positively supports the relationship between responsible leadership and the organization's intellectual capital, proving that this relationship is also mediated by effective teamwork.

## REFERENCES

- [1] Umićević, Z. (2019): Komparativna analiza stilova upravljanja u preduzeću. Zbornik radova Fakulteta tehničkih nauka, Novi Sad: Факултет техничких наука, God. 34, Br. 5, 867-870.
- [2] Kastratović, E, Arsenijević, O. (2020): Liderstvo u timskom radu kao element intelektualnog kapitala sportske organizacije. U: PEROVIĆ-VUJAČIĆ, Jelena S. (ur.). Unifikacija prava i pravna sigurnost: zbornik radova 33. susreta Kopaoničke škole prirodnog prava Beograd: Копаноничка школа природног права.
- [3] Kastratović, E, Dragić, M, Arsenijević, O. (2022): Comparative analysis of the views of management students and managers on the importance of creativity for work, Faculty of Business Economics and Entrepreneurship International Review (2022 No.3-4), pp.22 <https://www.international-review.com/index.php/ir/issue/view/23/4>
- [4] Živković, N. (2019): Uticaj osobina ličnosti na timski rad. Zbornik radova Fakulteta tehničkih nauka. Novi Sad: Факултет техничких наука. God. 34, Br. 5, str. 1845-1848.
- [5] Lojić, R. (2019): Liderstvo. Ministarstvo odbrane. Beograd: Univerzitet odbrane, Vojna akademija, Medija centar «Odbrana».
- [6] Kastratović, E, Dragić, M, Arsenijević, O. (2022): Comparative analysis of the views of management students and managers on the importance of creativity for work. International review. [Štampano izd.]. no. 3/4. 18-23.
- [7] Arsenijević, O, Pajić, S, Krstić, S. (2021): Storytelling as an element of knowledge management in cultural heritage. International journal of economics and law. [Onlajn izd.]. vol. 11. no. 32. 1-10.
- [8] Northouse, P. G. (2007): Liderstvo – teorija i praksa, 4. Izdanje. Beograd: Data Status.
- [9] Arsenijević, J, Arsenijević, O. (2022): Changing the cultural paradigm in the Digital age. Баштина: гласник. sv. 56. 241-255.
- [10] <https://www.ddiworld.com/blog/team-effectiveness> (pristupljeno: 12. 10. 2023)
- [11] <https://deakinco.com/resource/key-elements-of-effective-teamwork/> (pristupljeno: 10. 10. 2023).
- [12] Ying, Y, Fang, T. Y. (2019): Factors affecting the effectiveness of team building among employees in small and medium enterprises in Malaysia. International Journal of Modern Trends in Business Research (IJMTBR). Volume: 2 Issues: 10. 26 – 33.

### Article history:

Received 5 February 2023

Accepted 30 November 2023



**PART III**  
**INVESTMENT AND THE DIGITAL ECONOMY**



# UNDERSTANDING THE DYNAMICS OF INVESTMENT FACTORS AND EXCHANGE-TRADED FUNDS PERFORMANCE IN THE U.S. MARKET 2018-2022

**KORENAK Boris<sup>1</sup>, STAKIC Nikola<sup>2</sup>, VESIC Tamara<sup>3</sup>**

<sup>1</sup>*Investometrix (CANADA)*

<sup>2</sup>*Singidunum University; Belgrade (SERBIA)*

<sup>3</sup>*Faculty of Business Economics and Entrepreneurship, Belgrade (SERBIA)*

*E-mails: korenak.boris@investometrixgroup.com; nstakic@singidunum.ac.rs; tamara.vesic@vspep.edu.rs*

## ABSTRACT

*The increasing popularity of exchange-traded funds (ETFs) among retail and professional investors necessitates a deeper understanding of their value-creation process. Recognizing inconsistencies between stated investment strategies and portfolio exposures is crucial for appropriate rebalancing in accordance with investment policy statements. Against the backdrop of evolving investment factors during the pandemic and changing geopolitical circumstances, the performance of ETFs has undergone significant shifts. Analyzing the directional changes of prevailing investment factors within specific macro environments is essential for optimizing portfolios composed out of ETFs. This study has a dual objective: firstly, to comprehend the dominant investment factors and their dynamics in the U.S. market, and secondly, to evaluate the performance of ETFs that adhere to specific investment philosophies and strategies. To achieve these objectives, the Fama-French three and five-factor models were employed to analyze a dataset comprising 72 U.S. ETFs. These ETFs were then categorized into four portfolios based on investment style and size. Performance appraisal measures were utilized to compare portfolios on a risk-adjusted basis relative to the benchmark. The bear market that commenced in early 2022 had a universally negative impact on observed ETFs due to their long-only exposures. This inflection point also marked a shift in the relative performance between value and growth styles, as well as the outperformance of more conservative investing approaches, underscoring the importance of adapting to changing market conditions. Additionally, the absence of a size premium throughout the observed period confirms investors' preference for large-cap stocks as a resilient factor. Furthermore, the size effect exerted a universal negative influence due to the size drift of ETFs employing a stated large-size investment strategy. During the observed period, the value style experienced a significant recovery, characterized by higher book-to-price ratios, operating profits, and more conservative investment policies that produced superior results compared to the previous longer period. The findings of this research enhance our understanding of the influence of investment factors on U.S. ETF performance, providing valuable insights for investors and portfolio managers who may need to adjust their strategies in response to observed changes in market dynamics.*

**Keywords:** *Exchange-traded funds, Investment factors, Financial markets, Investment performance, Performance attribution*

**JEL:**G10

**DOI:** 10.5937/intrev2304123K

**UDC:** 339.137.27(73)

336.76

**COBISS.SR-ID** 133918473

## INTRODUCTION

To fully understand the complexities and dynamics of financial markets, engaging in continuous analysis and monitoring is necessary. Financial markets are constantly evolving, reacting to new information and reflecting the behavioral biases of the investment community. Over time, markets can experience shifts in trends and changes in the factors that drive returns and risk. Therefore, it is important to recognize that the impact and direction of investment factors may not remain constant over time and may vary based on market conditions and other factors.

This research focuses on understanding and explaining the market factor dynamics at play in financial markets. However, the study does not stop there. It also provides insights into the performance attribution of individual exchange-traded funds (ETFs) and hypothetical portfolios that are constructed in line with specific investment philosophies and strategies. By examining the sources of returns and risk for these funds and portfolios, the study aims to provide a more comprehensive understanding of investment performance and provide insight into the investment decision-making process. By understanding the dynamics of market factors and the ways in which they influence the performance of different funds and portfolios, it is possible to optimize investments and make more informed decisions about portfolio construction and risk management.

The main objective of this study is to examine the key investment factors that have affected the performance of ETFs in the United States over the 2018-to-2022-year period, as well as to provide insights into the evaluation of ETFs' performance. This is a two-part goal, with the first aim being to understand the dominant investment factors and their dynamics in the U.S. market, and the second aim being to analyze the performance of ETFs that follow particular investment philosophies and strategies. By examining the sources of returns and risk for ETFs in the context of market conditions, the study aims to provide a more comprehensive understanding of investment performance. Adequate investment performance evaluation is essential for decision-makers, as it can help to explain the drivers of returns and risk and inform the optimization of portfolio exposures. By providing a feedback loop mechanism for investment decision-makers, the study aims to help them align their portfolio exposures with their economic expectations and goals.

Factor- and holdings-based models are essential tools for the process of investment performance attribution. These models allow for the decomposition and attribution of the sources of returns and risks in an investment portfolio. Without the use of these models, it may be difficult to accurately understand the drivers of performance and identify opportunities for improving portfolio construction and risk management. For this reason, it is important for investment managers to make use of factor- and holdings-based models on an ongoing basis as part of their investment decision-making process. By using these models to analyze the sources of returns and risk, managers can gain a better understanding of the factors that are driving portfolio performance and identify areas for improvement.

Current and prospective investors also need to be aware of the potential for inconsistency between stated investment policies and the actual exposures of their portfolios. This is because drift in investment style and other factors can occur over time, leading to deviations from the intended investment strategy. By being aware of these potential issues, investors can take steps to ensure that their portfolios are aligned with their stated investment policies and goals. Overall, the use of factor- and holdings-based models is a critical component of the investment performance attribution process, and it is important for both investment managers and investors to make use of these tools to improve the quality of their investment decision-making.

## LITERATURE REVIEW

The seed of the methodological background of the deployed models is laid decades ago. Since then, it has been the keystone of mainstream finance theory and it has been extended in a few major instances by research papers that have shaped the investment performance evaluation framework.

Factor-based models are commonly used in research papers for performance attribution because they provide a systematic way of understanding the sources of returns for a particular investment. The Capital Asset Pricing Model (CAPM)[1] is a popular factor model that attempts to explain expected returns using market risk as a factor. However, it has been shown to be unreliable in empirical tests. The Fama-French three-factor model[2] is an extension of the CAPM that identifies three factors that influence stock returns: the market factor, a factor related to firm size (SMB), and a factor related to the book-to-market ratio (HML). The model suggests that there are premiums for stocks with small market capitalizations and those with a high book-to-market ratio, which are referred to as value-style stocks. [2]

The Carhart four-factor model is another extension of the original CAPM, which includes momentum as an additional factor [3]. A study on the South African stock market (Boamah, 2015) found that the Fama-French and Carhart models were able to capture size, book-to-market, and momentum effects on the mentioned market. The study also found that small, high-book-to-market stocks were riskier than large, low-book-to-market stocks. [4]

The Fama-French five-factor model [5] is an extension of the three-factor model that adds two additional factors: robust-minus-weak profitability (RMW) and conservative-minus-aggressive investment (CMA). This model suggests that there are additional returns for companies with high levels of profitability and those that invest conservatively. The authors also found that the value factor in the three-factor model was not necessary for describing average returns in the sample they examined when the profitability and investment factors were included [5]. In a subsequent paper (Fama & French), the same authors demonstrated that positive exposures to RMW and CMA (returns from profitable, conservatively investing firms) were associated with high average returns, low market beta, share repurchases, and low stock return volatility, and vice versa. [6]

Focusing on the most recent research papers, there are a few noticeable trends when it comes to ETF investing:

- ETFs popularity and cash-inflow in the retail investor realm. [7]
- ETFs inclusion in professionally managed institutional portfolios. [8]
- Growing interest in ETFs' investment performance evaluation. [9] [10]
- ETF's investment style, -size, and other investment characteristics performance evaluation research topics growing interest. [11] [12]
- Possibility to draw certain conclusions based on the mutual funds' long track record for various investment styles, sizes, and other investment characteristics. [13] [14]

As a relatively new form of investment, ETFs have drawn the attention of investors, and the process of the cash flow migrations from traditional investments, such as direct investment to stocks or indirect via mutual funds have been gradually replaced by ETF investments. In an effort to explain why some investors migrated partially from stocks to ETFs while others migrated completely Meier & Maier [7] conducted the study.

The findings showed that both migration behavior were subject to the same perceptions, but the configurations that formed the behaviors were different. It was revealed that perceived investment possibilities, perceived risk reduction, administrative effort, expensiveness, and monetary loss costs influenced the migration from stocks to ETFs. In addition, they showed that three configurations of perceptions resulted in partial migration intention and one configuration resulted in complete migration intention. A complete migration required retail investors to sell their stocks and accept the costs incurred to invest in ETFs instead, while only some identified perceptions had to be present for a partial migration. [7]

Raising ETFs' popularity was not only specific to the retail investors' domain, but it has also naturally expanded to the professionally managed portfolios realm. Sherrill et al. [8] indicated that it is well-known that passively managed mutual funds use ETFs, although current research at the time had yet to establish the benefits of these positions. Focusing on ETF type, the authors investigated whether ETFs impacted portfolio management. Funds using benchmark ETFs saw reductions in cash holdings, particularly during periods of large flows, and lower tracking error. In contrast, non-benchmark ETF positions improved the performance of large mutual funds investing in micro-cap stocks while also reducing portfolio risk. While studies cautioned against the extensive use of ETFs, the authors concluded that ETFs could provide tangible benefits for funds when considering the type of ETF used. [8]

ETFs' investment performance evaluation draws the attention of the academic community. Arampatzis et al. [9] performed a study that examined the performance of fifty global ETFs traded on US stock exchanges. The specific time frame for the analysis was the period following the end of quantitative easing in 2014 to mid-2018, with data recorded on a weekly basis. The Capital Asset Pricing Model (CAPM) was employed to evaluate the performance of the ETFs based on their Morning Star ratings, using Sharpe and Treynor ratios, Jensen's alpha, and betas and  $a/b$  measures. The results indicated that the ETFs demonstrated selection skills and exhibited bearish behavior in relation to the market during the period of quantitative easing tapering. [9] In our research, we expand this approach further, by using three- and five-factor models, as well as additional investment performance appraisal measures. The reason behind it is the potential higher explanatory power of additional factors. Moreover, the reason is not to rely solely on the usage of any specific appraisal measure, but rather use them in a common perspective.

Investment performance evaluation in the context of investment style and other investment factors is well-established in academic research when it comes to mutual funds. Korenak (2022) demonstrated the predominance of investment drivers and their dynamics across the studied period, beginning with the financial crisis-induced recovery in the US mortgage market. The highly cyclical sectors started to perform worse than the defensive sectors in the most recent period, characterized by COVID-19 and geoeconomic events, as the dominant growth style lost its momentum. The results, however, provide a far more in-depth understanding of the dynamics of many market investing elements and their impacts on mutual funds' performance and alignment with their declared investment philosophies and strategies. When appropriate benchmarks were introduced, smart money did not live up to its reputation, and the statistically significant alphas diminished. [10] Due to the similarity of the variety of investment styles and size exposures in investment policies of mutual funds and ETFs, the same approach can be used for ETFs' performance evaluation.

Size exposure of the ETF is one of the factors that is researched for the previous period. Rompotis (2019) pointed out that there is a well-documented pattern in the literature concerning the outperformance of small-cap stocks relative to their larger-cap counterparts. His paper aimed to address the small-cap versus large-cap issue using data from the ETF industry. Several raw returns and risk-adjusted return metrics were estimated over the period 2012-2016. Results were partially supportive of the size effect. Small-cap ETFs outperformed large-cap ETFs in overall raw return terms, even though they failed the risk test. However, outperformance was not consistent on an annual basis, and this is also the focus of our research. When risk-adjusted returns were taken into consideration, small-cap ETFs were inferior to their large-cap counterparts. A possible generalization of the findings implied that profitable investment strategies could be based on the different performance and risk characteristics of small- and large-cap ETFs. [11] This is also a matter that we further explore in our research.

The popularity of the ESG topic in recent years was the trigger for ETFs performance study. The Lobato et al. (2021) study examined the risk-adjusted performance of socially responsible ETFs in comparison to conventional ETFs. The main empirical result was based on a risk-adjusted performance metric that did not rely on a linear framework. It measured the difference between the returns of an ETF and the returns of a volatility-match and efficient portfolio. In addition, performance was measured using alpha based on single and multifactor formulations. The results showed that the performance of socially responsible ETFs was not different from the performance of conventional ETFs. Given the results of the study, socially aware investors could choose to invest in socially responsible ETFs without sacrificing performance. [12]

Utilization of the Five-Factor Fama-French model for the investment performance of the mutual funds was deployed in the study conducted by Korenak & Stacic (2022). The results indicated that the original three factors were in line with expectations and there was no evidence of style drift. The operating profit factor had a causal relationship with the returns. However, the exposure to the investing factor was slightly negative, which may be unexpected given the value orientation of the mutual funds. The performance of the portfolio was found to be statistically significantly underperforming, with positive contributors including the market premium, a tilt towards stocks with strong operating profits and small capitalizations, and an aggressive investing strategy. The value-style tilt, on the other hand, led to negative performance because it was out of favor for the period 2010-2021 year. [13]

Lastly, Korenak (2022) conducted research using two types of models for determining the performance of investments: factor models and asset-based models. The factor models used included the capital asset valuation model, the three-factor Fama-French model, the Carhart model, and the five-factor Fama-French model. The asset-based models used were the Brinson-Hood-Beebower and Brinson-Fachler models, as well as geometric models. The research focused on thematic mutual funds in the United States, analyzing 240 individual funds at both the individual and portfolio levels, based on market capitalization and investment style. By using these models, the research was able to determine the impact of various factors on mutual fund portfolios and individual funds and found that certain aspects of investment philosophy were reflected in the investment strategies. The results also revealed that portfolio rebalancing can significantly improve returns when a dominant market investment style is predicted. The study also found that there is a high level of consistency at the portfolio and individual level based on the influence of factors from the applied models and that asset-based models provided more useful results for investment decision-making. The use of geometric models also helped overcome the shortcomings of arithmetic models for investment performance attribution over multiple periods. [14]

In our research, we make an effort to explain the ETFs' returns and their components. This includes investment-style and -size investment statement policy. In addition, we examine the exposures to different investment factors and their relation to the realized returns. Finally, we make an appraisal on a risk-adjusted basis using an appropriate benchmark.

## DATA AND METHODOLOGY

The research utilized factor-based models to examine the performance of ETFs. Fama-French three and five-factor models were deployed. The study used a sample of 72 individual ETFs, and four hypothetical portfolios were also constructed from these funds based on their stated investment style and size tilt.

The Large-Value portfolio (LV\_PORT) is composed of the following ETFs: SPDV, SURE, OUSA, SDOG, ESGS, ERM, FDRR, FDVV, FVAL, EDOW, FTA, FDL, RDVY, RNDV, FVD, QDEF, QDYN, QDF, LVHD, ROUS.

The Large-Growth portfolio (LG\_PORT) is composed of the following ETFs: AIEQ, ILCG, CACG, MTUM, QQQE, ENTR, FDMO, ONEQ, QQEW, QQXT, FPX, GURU, MILN, GVIP, PDP, PWB, QQQ, SPMO, RPG, IUSG.

The Small-Value portfolio (SV\_PORT) is composed of the following ETFs: VBR, FDM, FYT, SDVY, ROSC, RFV, RWJ, RZV, XSHD, XSVM, CSML, ISCV, IWN, IJS, CALF, DEEP, SQLV, SLYV, VTWV, VIOV.

The Small-Growth portfolio (SG\_PORT) is composed of the following ETFs: FYC, DWAS, RZG, XSMO, ISCG, IWO, IJT, JSML, SLYG, VTWG, VIOG, VBK.

Only 12 Small-Growth ETFs from the Morning Star database have a 5-year track record. All four portfolios were constructed using equal weighting.

The study analyzed the monthly returns of four hypothetical portfolios made up of different style-size ETFs. The observed period for the study was from January 2018 to December 2022, although the track record for the portfolios is limited due to their inception date. Also, the shorter time horizon was analyzed to make a comparison of the present market dynamics.

The Fama-French model was originally an extension of the CAPM, a single-factor model that only considered the difference between market and risk-free returns.

$$R_{it} - R_{ft} = a_i + b_i(R_{Mt} - R_{ft}) + s_iSMB_t + h_iHML_t + e_{it}$$

The Fama-French extended model added two additional factors: company size, based on market capitalization, and the book-to-market ratio as a proxy for value investing. The inclusion of these factors was motivated by the belief that small companies and companies with high book-to-market ratios tend to outperform their counterparts.

$$R_{it} - R_{ft} = a_i + b_i(R_{Mt} - R_{ft}) + s_iSMB_t + h_iHML_t + r_iRMW_t + c_iCMA_t + e_{it}$$

To compare the performance of different factors, certain breakpoints were established. Big stocks are those that make up the top 90% of the market by capitalization, while small stocks make up the bottom 10%. The 30th and 70th percentiles of relevant ratios, such as the book-to-market, operating profit, and investment ratios, are used as breakpoints for a given market.

The results of the study were presented monthly for the factor premiums and on an annual basis for the excess returns. Overall, this research provides a detailed analysis of the performance of ETFs and the factors that have influenced their performance over time.

## RESULTS AND DISCUSSION

The results provide a detailed understanding of the investment factors that have produced the United States ETFs' performance over a given period. The study period covers the pandemic period, and which was also shaped in a later period by the geo-political events, and the results show the changing dynamics of various investment factors during this time. In particular, the study found that the growth style of investing lost momentum and underperformed in comparison to the value style in more recent periods. This might indicate that the investors became more conservative and less willing to pay high multiples in exchange for expectations of growth in the future.

However, the results of the study offer more than just a snapshot of the performance of different investment styles. They also provide insight into the underlying dynamics of various investment factors

in the market and their effects on ETFs' performance. Moreover, the study found that smart money did not always live up to its name, and when appropriate benchmarks were introduced, the alphas with statistical significance diminished. This highlights the importance of considering a wide range of factors when evaluating ETFs' performance and the need to take a comprehensive approach to investment analysis. Overall, the results of the study provide valuable insights into the dynamics of investment factors in the U.S. market and the ways in which these factors influence ETFs' performance and consistency with stated investment philosophies and strategies.

The Fama-French five-factor model was applied to four hypothetical portfolios composed of ETFs, and the results are presented in Tables 1 to 4. The coefficients of determination for the five-factor model ranged from 98.0% to 99.0%. The F-statistic had a high value for all the tested ETFs' portfolios, indicating that the model was a good fit for the data. No significant autocorrelation or heteroscedasticity was found in the results.

The results suggest that the most prominent factor, with a high statistical significance based on t-stat values, that explains the ETFs' performance is the market premium. Due to the long-only exposure of the individual ETFs within the portfolios, it is not surprising that the coefficient for the market premium tends towards 1 for all four hypothetical portfolios. The rest of the factors will be discussed on a self-standing basis. Additional four factors for LV\_PORT [Table 1] are only partially in line with the expectations as per their stated investment strategy. The size factor is slightly positive even though ETF exposure should be a tilt toward the stocks with relatively large market-cap. On another hand findings regarding the exposure to stocks that have high book-to-price ratios are in accordance with the expectations, the coefficient is positive with a high statistical significance. This is in line with the value-style stated investment ETFs policy. Two more factors need to be considered. The operating profit factor shows a relatively low coefficient but with statistical significance in the case of, meaning when the returns on the highly profitable stocks outperform their peers the impact is negative for the observed hypothetical ETFs portfolio. The investing factor indicates that LV\_PORT has exposure toward the stocks of the companies that pursue more conservative investing policies, at the same time, the t-stat value suggests statistical significance. Apart from the size factor, all factors are in line with the ETFs' investment-stated strategy.

**Table 1.** Large-Value Portfolio (LV\_PORT) Fama-French Five-Factor Model Results (Jan 2018-Nov 2022)

Factors	Rm-Rf	SMB	HML	RMW	CMA	Annual Alpha	R <sup>2</sup>	F-stat
<b>Coefficient</b>	0.90	0.07	0.24	0.17	0.20	-2.55%	98.0%	507.9
<b>t-stat</b>	40.499	1.402	6.537	3.097	3.496	-1.907		
<b>p-value</b>	0.000	0.167	0.000	0.003	0.001	0.062		

Source: own study, based on

([https://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data\\_library.html](https://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html))

The study [Table 2] found that the LG\_PORT ETF confirmed a growth-style investing strategy, as indicated by its exposure to stocks with low book-to-price ratios. It also appears to have an aggressive investing policy, as indicated by its exposure to stocks of companies that pursue less conservative investing policies. The size factor was the only factor that did not align with the stated investment strategy, as the portfolio had a neutral exposure to stocks with a relatively large market cap rather than a tilt towards larger stocks. The operating profit factor showed a negative coefficient with statistical significance, meaning that when high-profit stocks outperform their peers, the impact is negative for the LG\_PORT portfolio. Overall, it seems that the study found that the LG\_PORT mostly aligns with its stated investment strategy, apart from the size factor that is neutral.

**Table 2. Large-Growth Portfolio (LG\_PORT) Fama-French Five-Factor Model Results (Jan 2018-Nov 2022)**

Factors	Rm-Rf	SMB	HML	RMW	CMA	Annual Alpha	R <sup>2</sup>	F-stat
<b>Coefficient</b>	1.04	0.01	-0.18	-0.14	-0.05	-0.01%	99.0%	1015.44
<b>t-stat</b>	60.876	0.177	-6.400	-3.371	-1.130	-0.013		
<b>p-value</b>	0.0000	0.860	0.000	0.001	0.263	0.989		

Source: own study, based on

([https://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data\\_library.html](https://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html))

The study also found [Table 3] that the SV\_PORT is in line with a value-style investing strategy, as it is composed of stocks with high book-to-price ratios and in companies with conservative investing policies. The operating profit factor had a high coefficient with statistical significance, meaning that the SV\_PORT portfolio performs well when high-profit stocks outperform their peers. Overall, the study found that the SV\_PORT fully aligns with its stated investment strategy. However, the portfolio had only slight positive exposure to small-cap stocks rather, without statistical significance.

**Table 3. Small-Value Portfolio (SV\_PORT) Fama-French Five-Factor Model Results (Jan 2018-Nov 2022)**

Factors	Rm-Rf	SMB	HML	RMW	CMA	Annual Alpha	R <sup>2</sup>	F-stat
<b>Coefficient</b>	0.90	0.07	0.24	0.17	0.19	-2.44%	98.0%	532.49
<b>t-stat</b>	41.505	1.455	6.605	3.182	3.378	-1.861		
<b>p-value</b>	0.000	0.152	0.000	0.002	0.001	0.068		

Source: own study, based on

([https://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data\\_library.html](https://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html))

Finally, the analysis discovered [Table 4] that the SG\_PORT does not adhere to a growth-style investing approach since it makes investments in stocks with high book-to-price ratios and in businesses with conservative investment practices. The portfolio performs well when high-profit stocks beat their peers because the operational profit component has a high coefficient and statistical significance, and this is opposite to the growth style. According to the study's findings overall, the SG\_PORT does not match its declared investment strategy. However, the portfolio's exposure to small-cap equities was present and statistically significant. We can conclude that there is a possible style drift but not a size drift. It is important to stress that due to the inception date limitation of the ETFs that stated to follow a small-growth strategy the ETFs sample size was limited for this portfolio.

**Table 4. Small-Growth Portfolio (SG\_PORT) Fama-French Five-Factor Model Results (Jan 2018-Nov 2022)**

Factors	Rm-Rf	SMB	HML	RMW	CMA	Annual Alpha	R <sup>2</sup>	F-stat
<b>Coefficient</b>	1.02	0.85	0.38	0.18	0.06	-2.09%	99.3%	399.9
<b>t-stat</b>	58.690	22.869	13.308	4.243	1.481	-2.004		
<b>p-value</b>	0.000	0.000	0.000	0.000	0.145	0.050		

Source: own study, based on

([https://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data\\_library.html](https://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html))

None of the four portfolios [Table 5] was able to produce a positive excess return on an annual basis utilizing both Fama-French models. The explanation power of the five-factor model was higher in all cases, and that is true even after the penalty factor introduction. It can be concluded that the five-factor model was more suitable for the ETFs' investment performance attribution.

**Table 5. Multifactor models comparison (Jan 2018-Nov 2022)**

Name	Fama-French Three-Factor model			Fama-French Five-Factor model		
	Annual Alpha	R <sup>2</sup>	R <sup>2</sup> Adjusted	Annual Alpha	R <sup>2</sup>	R <sup>2</sup> Adjusted
LV_PORT	-0.84%	97.2%	97.1%	-2.55%	98.0%	97.8%
LG_PORT	-0.87%	98.7%	98.7%	-0.01%	99.0%	98.9%
SV_PORT	-0.78%	97.4%	97.2%	-2.44%	98.0%	97.9%
SG_PORT	-1.22%	98.9%	98.8%	-2.09%	99.3%	99.3%

Source: own study, based on

([https://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data\\_library.html](https://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html))

The results [Table 6] were confirmed when the factor-model benchmark was replaced with Vanguard 500 Index. All the portfolios underperformed in relation to the newly introduced benchmark. The appraisal measures suggest that LV\_PORT and LG\_PORT had the best performance in the group, as per the most risk-adjusted ratios. This is for the most part to the lower self-standing and relative volatility. At the same time, these portfolios exhibit the lowest expected losses according to Value-at-Risk, with the exception of analytical Value-at-Risk for the benchmark that is slightly lower.

**Table 6. Investment' Performance Appraisal for ETFs in relation to Vanguard 500 Index (Jan 2018-Dec 2022)**

Measure	LV_PO RT	LG_PO RT	SV_POR T	SG_POR T	Vanguard 500 Index
Arithmetic Mean (monthly)	0.72%	0.80%	0.70%	0.68%	0.89%
Arithmetic Mean (annualized)	9.03%	10.02%	8.78%	8.42%	11.17%
Geometric Mean (monthly)	0.58%	0.63%	0.43%	0.44%	0.74%
Geometric Mean (annualized)	7.16%	7.80%	5.24%	5.42%	9.28%
Standard Deviation (monthly)	5.39%	5.88%	7.38%	6.85%	5.40%
Standard Deviation (annualized)	18.67%	20.38%	25.57%	23.73%	18.69%
Downside Deviation (monthly)	3.71%	3.89%	5.21%	4.76%	3.59%
Maximum Drawdown	-26.51%	-30.92%	-40.61%	-30.45%	-23.95%
Beta	0.95	1.05	1.20	1.15	1.00
Alpha (annualized)	-1.44%	-1.61%	-4.35%	-3.50%	0.00%
R Squared	90.68%	93.17%	77.35%	86.41%	100.00%
Sharpe Ratio	0.40	0.41	0.28	0.29	0.50
Sortino Ratio	0.57	0.61	0.39	0.41	0.74
Treynor Ratio (%)	7.80	7.91	5.98	5.97	9.38
Calmar Ratio	0.25	0.16	0.18	0.12	0.31
Active Return	-2.12%	-1.48%	-4.04%	-3.18%	n/a
Tracking Error	5.77%	5.42%	12.75%	9.20%	n/a
Information Ratio	-0.37	-0.27	-0.32	-0.36	n/a
Skewness	-0.54	-0.22	-0.62	-0.42	-0.37
Excess Kurtosis	1.19	-0.17	2.48	0.86	-0.19
Historical Value-at-Risk (5%)	-9.28%	-9.11%	-10.45%	-11.86%	-8.75%
Analytical Value-at-Risk (5%)	-8.08%	-8.81%	-11.35%	-10.51%	-7.99%

Source: own study, based on Bloomberg terminal

Decomposing the tracking record is required to have a better understanding of the ETFs' investing performance. The performance attribution findings [Table 7] for the period of five years are offered to achieve that. The market conditions were generally favorable for ETFs with the stock market outperforming a risk-free proxy on a cumulative level for the last five years. However, there was a negative trend to size factor for all observed portfolios due to their universal exposure towards small-cap stocks and the underperformance of small-cap to large-cap stocks at the same time. These results do not align with the predictions of the initial research using the Fama-French model, which suggests that small-cap stocks tend to outperform large-cap stocks. Additionally, the growth style outperformed the value style, as measured by the book-to-market ratio. This trend had a positive impact on the value of all portfolios with the exception of SV\_PORT. The performance of stocks from companies with strong operating profits and a conservative investing approach also affected the value of the portfolios. In the case of LG\_PORT, negative exposure to these types of stocks resulted in lost value, while in the case of all other portfolios, positive exposure to these stocks had a positive impact on their value.

*Table 7. ETFs Portfolio Performance Attribution (Jan 2018-Nov 2022)*

Name	Rm-Rf	SMB	HML	RMW	CMA	Total	Annual Alpha	R <sup>2</sup>
<b>Large-Value Portfolio (LV_PORT)</b>	78.41	-0.50	-1.46	8.37	6.90	70.45	-2.55%	97.96%
<b>Large-Growth Portfolio (LG_PORT)</b>	90.91	-0.05	1.10	-7.03	-1.72	83.09	-0.01%	99.00%
<b>Small-Value Portfolio (SV_PORT)</b>	78.77	-0.51	-1.45	8.43	6.53	71.43	-2.44%	98.05%
<b>Small-Growth Portfolio (SG_PORT)</b>	88.65	-6.38	-2.32	8.95	2.28	73.73	-2.09%	99.34%
<b>Factor Premiums (BPS)</b>	8 7.31	- 7.53	- 6.08	5 0.56	3 5.22			

*Source: own study, based on*

*([https://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data\\_library.html](https://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html))*

The observed period in question is the one that started at the beginning of 2022 [Table 8] due to the geopolitical global setting and economic conditions. The period was chosen for comparison because it represents a meaningful or relevant benchmark for evaluating the performance of different portfolios. During this period, the market as a whole underperformed compared to the risk-free rate, which is typically assumed to be the return on a zero-risk investment such as a US Treasury bond. This means that the overall return on the market was lower than the return that investors could have obtained by simply holding a safe asset without any risk. The impact of this underperformance was felt across all portfolios, as the value of their holdings declined relative to the risk-free rate. In addition to underperforming compared to the risk-free rate, the market also showed different dynamics between small-cap and large-cap stocks. Specifically, the performance of small-cap stocks was worse than that of large-cap stocks, as measured by some appropriate benchmark index. This could be due to a variety of factors, such as the relative riskiness or liquidity of small-cap stocks, the state of the sector or the industries in which they operate, or the specific characteristics of the companies in question.

Despite the overall negative performance of the market and the underperformance of small-cap stocks, the value style made a comeback in a big way during the observed period. Strategies that involved overweighting stocks with higher book-to-price ratios outperformed those that focused on growth stocks (i.e., those that are expected to have higher future earnings growth). This suggests that investors who were able to identify and invest in value stocks were able to capture higher returns, despite the challenging market conditions. Furthermore, assigning higher weights towards stocks of companies that have higher operating profits and more conservative investment policies also delivered better results than was the case for the previously observed longer period. This could be because these companies were better able to weather the market downturn and maintain their profitability, or they were more cautious and avoided making risky or speculative investments that may have backfired.

**Table 8. ETFs Portfolio Performance Attribution (Jan 2022-Nov 2022)**

	<b>Rm-Rf</b>	<b>SM B</b>	<b>HML</b>	<b>RM W</b>	<b>CMA</b>	<b>Total</b>	<b>Annual Alpha</b>	<b>R<sup>2</sup></b>
<b>Large-Value Portfolio (LV_PORT)</b>	-118.07	- 0.29	31.29	15.85	60.10	-21.14	-1.20%	99.68 %
<b>Large-Growth Portfolio (LG_PORT)</b>	-143.81	- 0.43	- 36.28	-6.49	-4.82	- 211.48	-2.37%	99.60 %
<b>Small-Value Portfolio (SV_PORT)</b>	-118.07	- 0.29	31.29	15.85	60.10	-21.14	-1.20%	99.68 %
<b>Small-Growth Portfolio (SG_PORT)</b>	-139.65	- 6.19	81.80	15.79	18.02	-40.12	-1.19%	99.88 %
<b>Factor Premiums (BPS)</b>	<b>-134.91</b>	- <b>7.45</b>	<b>257.2</b> <b>7</b>	<b>69.27</b>	<b>203.6</b> <b>4</b>			

Source: own study, based on

([https://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data\\_library.html](https://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html))

## CONCLUSIONS

For the longer-term period, which accounts for the emergence of the pandemic environment, the market premium, operating profitability, and conservative investing policy delivered positive factor premiums. In contrast, during the same period, exposure to the low book-to-market and small-cap size effects had the opposite impact. After the inflection point, marked by the bear market that commenced in early 2022 the dynamics of the investment factors have changed. The market premium sharply declined due to the market index decline and treasury bill yield increase, as a part of monetary tightening. Value book-to-market factor had re-emerged in dramatical fashion, by being the prevailing contribution component based on factor premiums. When it comes to the size effect for raw unadjusted returns, the results are inconsistent with Rompotis (2019) results. During both short and long-term periods, the investors' preference was in favor of large-cap stocks that showed a higher level of resilience during the turbulent macro environment in comparison to their small-cap peers. However, the changing market dynamics in observing periods can explain the differences. On the other hand, the results are in line with Fama & French (2015), when it comes to value factors for the most recent period, after market inflection moment. This is demonstrated by the short-term most recent observed period that was characterized by significantly different market dynamics compared to the longer period, with the value style outperforming the growth style, and more conservative investing strategies delivering better results. Appraisal on a risk-adjusted basis showed that large-cap ETFs have outperformed their small-cap peers. This can be for the most part explained by their lower self-standing and relative volatility. The findings are consistent with Rompotis (2019) study claiming that on a risk-adjusted basis, small-cap stocks underperform large-cap peers. The explanatory power of the five-factor model was higher in all cases, and that is true even after the penalty factor introduction. This is consistent with Fama & French (2015) and Fama & French (2004). The investment alpha for portfolios composed out of ETFs was not present both for multi-factor models and appraisal measures. These results are in line with the mutual funds study findings Korenak (2022). In addition to the findings mentioned above, it may be useful to consider the implications of the size drift observed in some of the ETFs. This can affect the risk and return characteristics of the ETF and may lead to divergences from the index performance. It is important for investors to be aware of any size drift in ETFs they are considering, as it may impact the expected returns and risk profile of the investment. On the other hand, the absence of pure-style drift in the ETFs studied suggests that they were able to maintain a consistent investment strategy and closely track the performance of the underlying index. These findings are not in line when it comes to size-drift presence but in line with size-drift absence Korenak & Stacic (2022).

The study provided valuable insights and tools for a variety of stakeholders within the investment community. For professional investment decision-makers, the results of the attribution models presented in the study can serve as a useful resource for optimizing portfolios according to their expectations and goals. By analyzing the sources of returns and risk for ETFs in the context of market conditions, the study may provide a feedback mechanism for decision-makers to fine-tune their portfolio exposures and make more informed investment decisions. Further studies can be developed in the direction of

understanding specific ETFs' performance based on investment strategies, themes, and exposures, that go beyond the investment factors within mainstream multifactor models.

## REFERENCES

- [1] Black, F., Jensen, M. C., & Scholes, M. (1972). The capital asset pricing model: some empirical tests, *Studies in the theory of capital markets*: New York, NY [u.a.], pp. 79–121. Available at: <https://ezproxy.nb.rs:2076/login.aspx?direct=true&db=edszwb&AN=EDSZBW379448416&site=eds-live> (Accessed: 01 January 2023).
- [2] Fama, E. F., & French K. R. (2004). The Capital Asset Pricing Model: Theory and Evidence, *The Journal of Economic Perspectives*, 18(3), pp. 25–46. Available at: <https://ezproxy.nb.rs:2076/login.aspx?direct=true&db=edsjsr&AN=edsjsr.3216805&site=eds-live> (Accessed: 20 March 2022).
- [3] Carhart, M. (1997). On Persistence in Mutual Fund Performance, *The Journal of Finance*, 52(1), pp. 57–82. doi: 10.2307/2329556
- [4] Boamah, N. A., (2015). Robustness of the Carhart four-factor and the Fama-French three-factor models on the South African stock market, *Review of Accounting and Finance*, 14(4), pp. 413–430. doi: 10.1108/RAF-01-2015-0009
- [5] Fama, E. F., & French, K. R. (2015). A five-factor asset pricing model, *Journal of Financial Economics*, 116(1), pp. 1–22. doi: 10.1016/j.jfineco.2014.10.010
- [6] Fama, E. F., & French, K. R. (2016). Dissecting Anomalies with a Five-Factor Model, *The Review of Financial Studies*, 29(1), pp. 69–103. Available at: <https://ezproxy.nb.rs:2076/login.aspx?direct=true&db=edsjsr&AN=edsjsr.43866012&site=eds-live> (Accessed: 28 December 2022).
- [7] Meier, M., & Maier, C. (2022). From stocks to ETFs: explaining retail investors' migration behavior. *Internet Research*, Vol. ahead-of-print No. ahead-of-print. <https://doi.org/10.1108/INTR-09-2021-0695>
- [8] Sherrill, E., Shirley, S., & Stark, J. (2020). ETF use among actively managed mutual fund portfolios. *Journal of Financial Markets*, Volume 51, 2020, 100529, ISSN 1386-4181, <https://doi.org/10.1016/j.finmar.2019.100529>
- [9] Arampatzis, M. Daskolou, K., Papaioannou, E., & Prassa, P. (2020). Performance Evaluation of Global High-rated ETFs During the Taper Tantrum. *Journal of Central Banking Theory and Practice*, vol.9, no.1, pp.23-44. <https://doi.org/10.2478/jcbtp-2020-0002>
- [10] Korenak, B. (2022) Dynamics of Prevailing U.S. Equity Market Investment Factors and Insight into the Mutual Funds Performance Attribution, *Global Economic Trends – Challenges and Opportunities*, Belgrade Banking Academy, Belgrade, Serbia ISBN 978-86-7852-070-9
- [11] Rompotis, G. (2019). Large-cap vs small-cap portfolio performance: new empirical evidence from ETFs. *Review of Accounting and Finance*, Vol. 18 No. 1, pp. 71-94. <https://doi.org/10.1108/RAF-03-2017-0056>
- [12] Lobato, M., Rodriguez, J., & Romero, H. (2021). A volatility-match approach to measure performance: the case of socially responsible exchange traded funds (ETFs). *Journal of Risk Finance*, Vol. 22 No. 1, pp. 34-43. <https://doi.org/10.1108/JRF-04-2020-0066>
- [13] Korenak, B., & Stakic, N. (2022). Investment performance attribution of the U.S. small-size value mutual funds using Fama-French five-factor model. *International Review*, 1-2, 17-23. <https://doi.org/10.5937/intrev2202021K>
- [14] Korenak B., (2022). Investment Performance Evaluation of the United States Equity Thematic and Sector Mutual Funds' Portfolios, (Doctorial dissertation), University Singidunum, Belgrade, 10.13140/RG.2.2.30616.26886

### Article history:

Received 12 March 2022

Accepted 19 September 2023

# CONTROVERSIES OF FOREIGN DIRECT INVESTMENTS - THE CASE OF SERBIA

**BESLAC Milan<sup>1</sup>, COGOLJEVIC Vladan<sup>2</sup>, JANJUSIC Dragan<sup>3</sup>**

<sup>1,2</sup>Faculty of Business Economics and Entrepreneurship Belgrade (SERBIA)

<sup>3</sup>Faculty of Management, Sremski Karlovci (SERBIA)

Emails: milan.beslac@gmail.com, [vladan.cogoljevic@vspep.edu.rs](mailto:vladan.cogoljevic@vspep.edu.rs)

## ABSTRACT

*Foreign direct investments (FDI) represent one of the flows of international movement of capital that can affect positively and negatively the macroeconomic factors of development of the country of origin, as well as the host country. The Republic of Serbia has been attracting significant foreign direct investments in recent years, with its promotional legislation, natural and human resources, and strategic and market position, which is also visible in the reports and evaluations of the most eminent international organizations. In this regard, the objective of this paper is, in addition to a theoretical approach to the types and carriers of FDI, the advantages and disadvantages of the impact of FDI on the economic and social development of the country receiving investments, to investigate the views of foreign investors themselves on their motives for investing in Serbia. In this respect, for the purpose of elaborating the hypothesis about the diversity of influence and investment motives of foreign investors, an empirical study was carried out on a sample of 53 FDI companies from the territory of the entire Serbia in 2022. The results showed that the primary motives for FDI in Serbia are: The possibility of exporting to other markets, political relations between the investor's country and the country receiving the investment, and subsidies and incentives for employment. The results of the research in this paper can be useful to decision-makers on the improvement of the legal and business framework for attracting direct investments to Serbia, as well as the educational, technological and innovative infrastructure in motivating FDI for investments in high technology sectors so that their impact on the macroeconomic development of the country would have a greater added value.*

**Keywords:** FDI inflows, legal and business framework, greenfield investments, economic growth

**JEL:** F30, G11, O40, P33

**DOI:** 10.5937/intrev2304134B

**UDC:** 339.727.22(497.11)

338.24.021.8(497.11)

**COBISS.SR-ID** 133920521

## INTRODUCTION

International capital flows represent the transfer of real and financial assets and they are very important for the functioning of the economies of both developed and underdeveloped countries. These flows are a consequence of the fact that some countries have excess assets, while others have a deficit. The largest volume of international capital is carried out between the most developed countries for the reason that less developed countries, due to insufficient competitiveness, most often appear as recipients of capital, and less often as exporters of capital, but appear as exporters of raw materials [6].

According to the UNCTAD World Investment Report for the year of 2021., FDI inflows dropped by 19% in 2020., from 4.3 billion USD in 2019. to 3.4 billion USD, as a result of the global economic crisis caused by the Covid-19 epidemic. In 2020., the total amount of FDI was 51.8 billion dollars. The COVID-19 crisis mainly affected reinvested earnings. The economic decline also affected export-oriented activities, because problems in GVCs, of which Serbian companies were an integral part, led to the interruption of manufacture. The manufacturing sector, including machinery and equipment, metallurgy, and the rubber and plastics industry, were most affected by the decline of FDI. Despite trade disruptions and GVCs, the automotive industry still saw some expansion, such as the Magna Seating plant and Cooper Tire & Rubber (USA). In the services sector, the decline of FDI also affected a wide range of activities, including construction, trade, and transport and storage. Nevertheless, Serbia remains the second largest recipient of FDI among economies in transition after the Russian Federation. The European Union is the source of 70 percent of investments in Serbia, followed by Russia, Switzerland and Hong Kong. However, inflows from various FDI source countries, including Austria, Germany and Hungary, as well as the Russian Federation and the United States of America, declined significantly in 2020. According to official sources, Serbia attracted 4.4 billion dollars in foreign direct investments in 2021., which contributed to the opening of production facilities in Zrenjanin, Indjija, Backa Topola, Belgrade, Aleksinac and Subotica, thus creating a total of 12,490 job positions. According to the Data of the National Bank of Serbia [24], the inflow of foreign direct investments reached record levels of about 8% of GDP in 2021.

## LITERATURE REVIEW

UNCTAD defines foreign direct investments as investments aimed at long-term and permanent interest and control of a business entity-investor from one country in relation to another business entity from another country. FDI can appear through [30]: Establishment of completely new capacities (*Greenfield investment*); Cross-border acquisitions and mergers; Contracted joint ventures; Equity investments; Brownfield investments; and Concessions.

Since international capital flows represent the transfer of real and financial assets, these flows can be divided according to Beslac [1:168] into two types: international movement of private capital (loans, portfolio investments and FDI) and movement of public capital.

The international movement of loan capital has long been the dominant movement of loan capital. This capital moved from developed countries towards developing countries. Portfolio investments represent institutions granting loans and buying securities to a level which prevents them from making decisions and controls, on which the investments were made [21]. The motive for portfolio investments is interest, dividend or some other type of income (capital gain), but at the same time these investments also achieve diversification of the investor's risk, because investing in several types of securities reduces the risk of investment. Foreign direct investments represent such investments that provide the investor with the right of ownership, control and management of the invested capital [6]. Foreign direct investments, i.e. foreign capital, means investments from abroad, which come from private sources (institutions, companies, international organizations), but also from states and individuals [7]. It is significant for foreign direct investments that it is not necessary to achieve 100% control over the company, but to achieve such a level of ownership that allows the investor the right to manage and conduct business policy.

It is considered that the holders of FDI are multinational or transnational companies. Although some theorists distinguish between transnational and multinational companies, there is essentially no difference between them. Transnational or multinational companies are business companies that have their registered office in one country (parent company), but establish their branches (affiliations) in other

countries around the world (subsidiary companies), to whom they transfer funds with the objective of returning these funds to them, which results that their financing has the same effect as lending funds. However, since the establishment of subsidiaries abroad in the form of foreign direct investment aims to achieve ownership, the ability to manage and control over the established or some other form of foreign direct investments, it cannot be said that lending is the same as investing through FDI. Foreign direct investments imply the possibility for a company in one country and its subsidiary in another country to produce the same types of products (horizontal organization) or for the products of one company to be inputs for another company abroad (vertical organization) or to manufacture several types of different products or services (conglomerates) [1]. FDI, according to the *platform* principle, refers to the fact that the company expands to a foreign country, but the production from foreign operations is exported to a third country. This is also called FDI on the export platform. This raises the question of why the same company manufactures the same type of product in two different places (two countries) [7]. This issue is often seen as one of location and internationalization. The theory of location is closely related to the theory of trade, it is based on resources, which indicates that where the best or rare and necessary resources are, that is where economic activity takes place. The location for the manufacture of certain products, in addition to others, is also determined by the factors of transportation costs (The impact of the amount of transportation costs on competitiveness and profit, is moving manufacture to closer markets).

Modern economies are based on new organizational forms, new technologies, and new ways and models of gathering information, both about consumer needs and tastes, as well as the width, depth, and types of markets. All this contributes and creates conditions for transnational companies to carry out intensive expansion of their activities, with the objective of maximizing profits. Their target are countries, i.e. underdeveloped or less developed markets that lack domestic capital, and therefore have a need for foreign direct investments with the objective of ensuring economic development, employment, new technologies and an increase in the gross national product. [29].

The international movement of capital, observed as a consequence of globalist changes, the development of financial markets, the actions of multinational companies and global organizations such as the IMF, the World Bank, the World Trade Organization, contributed to the opening of the markets of less developed and underdeveloped countries to developed markets. This further affected the increase in living standards in these countries. But globalization also has another, negative side. It was created under the influence of developed countries that want to realize their interests in all spheres of life without paying much attention to the interests of other, less developed and underdeveloped countries. Namely, developed countries are not open to all products and services from underdeveloped and less developed countries, but that is why they strive for these countries to be completely open to all their economic and other activities. In relation to these movements, FDI can have positive, but also unfavorable effects on the macroeconomic factors of development of both capital-exporting countries and capital-importing countries. There are numerous studies conducted by various authors in developing countries, as well as in developed countries related to FDI and their effects on the macroeconomic parameters of the development of those countries as investment hosts. The majority of authors see the positive effects of these investments, and in this regard the following studies are cited: Borensztein et al. [8], believe that FDI have the ability to affect the transfer of technology more than domestic investments. They included 69 developing countries in their study. Durham [11], claims that there is a direct positive impact of FDI portfolio investments on the development of the country, as a result of the research of 80 countries. Authors Güner, and Yılmaz [14], investigated the impact of FDI on development in 104 countries and concluded that they have a positive effect on capital accumulation and development in those countries. Alfaro et al. [1], on the example of 20 OECD countries and 51 country that are not members of this organization, concluded that, mostly countries that had a developed financial market also received benefits from FDI, while at the same time not realizing the automatic direct positive effects of FDI on the economic development of these countries. countries. Balasubramanyam, Salisu, and Sapsfort [2], studied aspects of the impact of FDI on the development of employment and skills of workers based on a study conducted in 46 countries. They stated that for a positive impact of FDI on the development process itself, the most important prerequisites are labor relations, respect for labor standards and training of workers. They also believe that exporting countries can have greater benefits from FDI. Bornschier, Chase-Dunn, and Rubinson [9], by conducting a study on the impact of FDI on the development of 76 less developed countries, came to the conclusion that these investments in themselves

do not significantly affect the economic development of these countries, but that they positively affect it by increasing the level of the country's income. De Mello [10], based on a study of 32 OECD countries, stated the irreversibility of FDI and technological development, by emphasizing the positive impact in countries that are technological leaders, and less in those that are less technologically developed. Duttaray [12], by studying FDI flows in 66 developing countries, reached the result that in less than 50% of these countries the impact of these investments on their economic development was achieved. Basuand and Guariglia [3], in their research in 119 countries on the effects of FDI, concluded that they affect the economic development and improvement of skills and knowledge in developing countries, but also reduce the participation of the agricultural sector in the country's GDP. Basu, Chakraborty, and Reagle [4], have, by studying FDI in 23 developing countries, concluded that the positive impact of FDI on economic development occurs in the long term, and that it is not visible in current development.

The authors Bengoa, and Sanchez-Robles [11], believe that economic freedoms in a host country are an important determinant of attracting FDI, which will influence the positive flow in further economic development. Hansen, and Rand [15], believe that there is a strong connection between FDI and GDP growth in developing countries, by studying 31 country in their study. Hermes, and Lensink [16], believe, based on a study conducted in 67 less developed countries, that the prerequisite for a positive impact of FDI on development in a host country is the level of development of the financial market and institutions. Authors Hsiao, and Hsiao [17], by studying FDI in 8 countries and their contribution to development, came to the conclusion that these investments affect export and thus indirectly contribute to the economic development of the country. In a study conducted by Hyun [18], in 59 developing countries, by investigating the impact of FDI on macroeconomic indicators, he came to the conclusion that these investments have little positive effects on the current economic development in those countries. Johnson [20], in his study conducted in 90 developing and developed countries, stated that FDI flows accelerate the economic development of developing countries, which is not valid for developed countries. Li, and Liu [22], studied the impact of FDI on the development of 21 developed and 63 developing countries and came to the conclusion that the influence of endogenous factors of the connection between FDI and economic development has increased since the eighties, and also the connection of FDI with human and technological capital of those countries.

Menzinger [23], believes that FDI affect economic development, but they do not affect FDI flows, based on a study he conducted on this topic in 8 EU countries. Papanek [25], conducted two studies on the effects of FDI on the economic development of FDI recipient countries, the first on a sample of 34 countries and the second on a sample of 51 country in a ten-year interval. He came to the conclusion that: savings and FDI flows make up one third of the economic development of these countries, and that foreign aid has a greater impact on economic development than other incomes. He also concluded that there is no mandatory connection between FDI and foreign aid and an implied correlation with per capita income and the size of the country itself. Zhang, and Ram [30], based on their research on FDI in 85 countries, came to the results that confirm the positive relationship between these investments and the economic development of those countries.

## RESEARCH RESULTS AND DISCUSSION

*Motives of the inflow of foreign direct investments.* The development of the economy of each country depends on many factors. FDI, although they are not one of the most important factors in the development of every country, occupy a significant place. Countries that do not have enough of their own capital for investments and thereby ensure higher rates of economic development, as an imperative, attract FDI [26]. FDI have many forms and all these forms do not affect the economic development of the country receiving the capital in the same way, nor do they have the same effect on the country providing the capital. Therefore, FDI cannot be viewed only through the economic effects achieved by the recipient country or the capital donor country, but the role of FDI should be observed through the prism of various other effects such as employment, technology transfer, increase in the living standard of the population, increase in income per capita, infrastructure improvement, social effects. FDI have a complex effect on numerous factors of the overall economic life of the host countries as well as on the overall economic life of the countries providing the capital, but at the same time on the domicile, regional and global markets.

In principle, the inflow of FDI depends on the business environment, that is, the investment conditions of the host country as a potential capital investment destination. The basic business environment (investment conditions) of a country or destination for FDI inflow is characterized by the openness of the country or destination, on the one hand, and the risk assessment of a particular investor. In order for an investor to invest in another country or destination, he analyzes and evaluates the economic and political risks. Namely, every investor wants to know in advance predictable and low-risk conditions, which means that he wants stable macroeconomic conditions characterized by stable economic growth, stable and predictable exchange rate, low or predictable inflation rate, stable market, etc. Since foreign investors almost as a rule come from developed countries, where macroeconomic and microeconomic conditions are stable, they want to know in advance the rules of conduct from which there will be no significant deviations. This primarily refers to the rule of law and clear and unambiguous procedures that will not change from case to case. In the event that there is no rule of law and procedures are often changed, potential investors risk higher costs, which then reduces their planned profit, that is, there is uncertainty about realizing the planned profit. For investors, it is important that the political relations between the country from which the investor comes and the country to which the investor comes are at a high positive level, because political relations are the basis of all other relations.

The location of the investment destination still plays a very important role (but not the decisive one), its proximity to developed markets, lower transport and other dependent costs. The low cost of labor is also an important factor for making investment decisions because it reduces the price of products and thus they become more competitive in terms of price. Training and productivity of workers, labor standards, labor laws and labor relations are also very important. Quality infrastructure and the possibility of using different forms of energy, the development of telecommunications and the availability of modern communication networks, also influence the positive decision of a potential investor, as well as the promotion of FDI [19]. In addition to these elements, the following factors are important for foreign direct investments:

1. Low prices of energy and raw materials also contribute to the reduction of business operations' costs, and thus to the increase of profits.
2. Completion of the production process.
3. Market expansion. A number of investors who come to Serbia are motivated by exports to the Russian Federation, with which Serbia has an Agreement on Free Trade without customs and other obstacles.
4. Free zones, because using them reduces customs and tax burdens.
5. Securing political influence: This motive is most present when states appear as investors, but political influence can also be achieved through private investors.

If there are more factors in the capital receiving country that positively influence investors from other countries - capital providers, consequently the inflow of FDI will be greater [27]. The authors of this paper believe that a special motive for accepting foreign direct investments is to eliminate the possibility of the introduction of sanctions by the country providing the capital, as this would endanger their own company.

Serbia was chosen for the assessment of foreign investors' investment motives and the contribution of FDI to the development of the host country due to its realized investments, as well as the legal and business framework for these investments, which were evaluated by the World Bank with top marks: (T.1).

*Table 1. Comparison of the index of protection of foreign investors in Serbia, 2022.*

	Serbia	Eastern Europe & Central Asia	United States	Germany
<b>Index of Transaction Transparency</b>	6.0	7.5	7.0	5.0
<b>Index of Manager's Responsibility</b>	6.0	5.0	9.0	5.0
<b>Index of Shareholders' Power</b>	5.0	6.8	9.0	5.0

*Source: [31]*

In the overview of the flow of FDI to Serbia, it is important to point out that the intensification of the inflow of FDI in the Republic of Serbia occurred after 2000. through the process of privatization. Then the most productive companies were privatized, such as cement factories, breweries, sugar factories, the dairy industry, telecommunications and the like. According to available data, in the period from 2001. to 2011., the inflow of foreign direct investments in Serbia amounted to 15,100 million. euros [19]. In this period, the largest inflow of FDI was in 2006., since in that year Mobtel was sold to the Norwegian Telenor for 1.6 billion euros. After that, in 2007., 2008., 2009. and 2010., there was a decline in FDI due to the decrease in the dynamics of privatization (because until 2006. the main source of FDI was the privatization process), but also due to the effects of the global economic crisis [13]. It is necessary to say that in this period not only Serbia was interested in attracting FDI, but all the countries of the Western Balkan region, which in the meantime has been transformed into a market with dynamic growth [29].

**Table 2.** Overview of FDI in Serbia in the period 2010.-2021. and basic macroeconomic indicators

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
FDI <sup>1</sup> in mil €	1,278	3,544	1,008	1,547	1,500	2,114	2,126	2,548	3,464	3,915	3,038	3,866
Real growth of GDP <sup>2</sup>	0.7	2.0	-0.7	2.9	-0.6	1.8	3,3	2.1	4.5	4.3	-0.9	7.5
Foreign exchange reserves in mil. € <sup>2</sup>	10,000	12,058	10,915	11,189	9,907	10,375	10,205	9,962	11,262	13,378	13,492	16,499
Unemployment <sup>2</sup> per survey	20.9	24.9	25.9	24.0	20.6	18.9	16.4	14.5	13.7	11.2	9.7	11.0
Public debt <sup>2</sup> in % of GDP	39.5	42.8	52.9	56.0	66.2	70.0	67.7	57.8	53.6	51.9	57.0	56.5
Foreign debt in mil € <sup>3</sup>	24,123	25,645	25,644	25,679	26,234	25,260	25,526	26,662	28,254	30,787	36,488	36,986
GDP in mil. € <sup>2</sup>	31,548	35,432	33,679	36,427	35,467	35,740	36,779	39,235	42,892	46,005	46,815	53,329

Source: [24]

The above data show that 2011. was a record year for the inflow of foreign direct investments. In 2012., there was a decline of FDI, but growth started already in 2013. The biggest contribution to the inflow of FDI in 2013. was the sale of the trade chain: Delta Maxi to the Belgian company: Delhaize for about 900 million euros. In 2019., FDI amounted to 3,915 million EUR, and in 2021., FDI increased compared to 2020. and amounted to 99% compared to 2019., and 27% more compared to 2020. The pandemic years 2020. and 2021. did not significantly affect the inflow of foreign direct investments, so that in 2020. they amounted to 77% compared to the pre-pandemic year. In order to determine the impact of FDI on the Serbian economy, it is necessary to analyze GDP growth, the unemployment rate, the rate of economic growth [5] as well as the amount of public debt.

The previous table shows that in the case of Serbia there is no complete correlation between the inflow of FDI and basic macroeconomic indicators, which means that FDI legitimately do not affect GDP growth, unemployment reduction, public debt or foreign exchange reserves.

## SAMPLING

For the purposes of this paper, in addition to the theoretical, an empirical research was conducted on the views of companies - direct foreign investors, on the topic of the level of significance of motives for FDI in Serbia. Respondents, representatives of FDI companies, were offered a set of motives that they had to rank and highlight the priority motives according to them. 53 companies from all over the country participated in the research in 2022. The survey used a questionnaire and online and telephone

communication with respondents. (Out of 157 questionnaires sent to FDI companies, 33,75% expressed interest in this research).

**Table 3. Motives for investing in the Republic of Serbia**

Basic motives for investing in Serbia						
Existence of professional staff	Placement of products and services on the domestic market	The possibility of exporting to other markets	Stable legislation	Political relations of the country from which the investors come and the host country	Monetary incentives per employee	Stable tax policy
8%	6%	25%	11%	21%	18%	11%

Source: Authors

According to the results of the survey of the views of representatives of the FDI companies that participated in it, the most important motive for investing in the Republic of Serbia was the possibility of exporting to other markets, i.e., to those countries with which Serbia has concluded Agreements on Free Trade (Russian Federation, EU, EAU, EFTA, CEFTA, UK, Turkey). In second place are the political relations of the countries from which the investors come and the host countries. This motive is objectively significant if it is taken into account that due to the conflict between Russia and Ukraine, various types of sanctions have been imposed on Russia, and numerous foreign investors have withdrawn from the Russian market. In third place are monetary incentives per employee. Although the survey showed that this motive is in the third place according to the way the respondents ranked the motive (first they put this motive in the first or second place, and then move it to the third place or even lower), which is why the authors of the paper got the impression that this motive is more significant than the final grade given by the respondents. Perhaps the most important motive of FDI. If it is taken into account that Serbia encourages foreign investors by providing them with grants of several tens of thousands of euros for each new job position, then this motive really has a great advantage over other motives. In addition, the importance of this motive is also evident from the fact that a number of companies leave Serbia after engaging all means of incentives. So far, the following companies have done this: Bertex Textile, Geox, Shinwon, Simit Saraj, Home Plus, Spilit, Servfood, Hendi, Leonardo, Gold exchange.

Most often, departing companies leave employees without a resolved employment relationship, with debts to employees and to the state. An interesting result of the research is that it shows that the market of the host country is not particularly important to foreign investors, nor is the existence of professional staff, because it is common for them to carry out training and further training, taking into account the technology they bring.

## CONCLUSION

Research of the motives of foreign direct investments and the effects on investors and the recipient country are different. The paper deals with the advantages and disadvantages as well as the motives of FDI in Serbia. It can be concluded that the positive effects of foreign direct investments on the importing country are reflected in:

- import of additional accumulation into the host country, they do not require the return of the investment amount nor is interest paid, as is the case with loan capital. At the same time, they contribute to economic development, which is reflected in the growth of the gross domestic product, and have a positive effect on the reduction and stabilization of inflationary trends, then improve the balance of payments. These investments, since they employ a large percentage of the domestic workforce, affect the reduction of the unemployment rate, i.e. increase the employment rate, and thus by paying taxes and contributions on the salaries of employees, they increase public revenues, while at the same time increase consumption and the standard of living of the population. Regardless of whether it is investing in less developed, undeveloped or developed countries, FDI bring new technologies that are very important for

the host country. The market (goods and services) is increasing, both in terms of quality and volume, which in the extreme can (but not necessarily) lead to lower prices, but certainly increase export (a large number of foreign investors invest in other destinations not only for the purpose of expanding the market in those destinations, but also for the purpose of exports) which positively affects the trade and balance of payments of the country.

It can be concluded that the negative effects of FDI on the host country are reflected in:

- Possibilities of irresponsible use of domicile resources (natural resources and labor force) under the exclusive interests of investors, the use of qualified labor force which is paid several times less than the same or similar personnel in the country from which the investors are coming,
- Frequent non-compliance with labor standards, workers' protection and industrial relations, which along with the insufficient interest of the established instruments of the social and economic entities of the host country in these matters leads to a kind of exploitation. Regarding the transfer of skills and knowledge, the educational system of the host country invests the most in the training and education of workers, and through additional training necessary for the investor, less often the investor himself. Since the most common foreign investments are in production with low or medium-developed technologies, the need for higher knowledge and skills is less frequent, so the transfer of technology itself is not carried out to the extent that FDI assume.
- When investing in the high-tech sector, the IT industry, telecommunications and energy, the highest quality personnel of domestic companies are taken over, which is otherwise in deficit (in the IT industry there is a permanent shortage of 38,000 experts per year), which weakens their competitive abilities. Foreign direct investors in the form of multinational companies or states, exert a very large influence on such consumption model (consumer society) that does not correspond to the population of the capital importing country. Also, foreign investors in the initial years of business operations, wanting to take over local markets, use dumping prices and thus destroy domestic competition, form monopoly or oligopoly markets from which only foreign investors benefit. A possible negative effect on the capital importing country is the violation of the sovereignty (political and economic) of the host country through these investments.

Looking at the data presented, the Republic of Serbia attracted 29,948 billion euros of foreign direct investments in the period from 2010. to 2021., and in the same period the foreign debt increased from 24 billion euros to 36 billion euros, which indicates that foreign direct investments did not contribute to the reduction of indebtedness. In the same period, GDP increased from 31 billion euros to 53 billion euros, which can be interpreted as a positive impact of attracted FDI in the country.

When it comes to motives for investing in the Republic of Serbia, research has shown that the most dominant motive for investing is the possibility of exporting to other markets. This motive is a consequence of the fact that Serbia has concluded Free Trade Agreements with Russia, Turkey, the EU, the EAU, the UK, the countries of the CEFTA Agreement and the countries of the EFTA Agreement. Another motive is the high-quality political relations between the country from which the investor of this motive comes and Serbia. The consistency of this motive is best seen from the example of Russia, from which many foreign investors left after its conflict with Ukraine. The third motive, which in the case of Serbia is probably the most significant, is the monetary incentives that Serbia grants to foreign investors for every newly created job position. If you look at the unemployment rate in 2010., which was 20.9%, and in 2021., it was 11%, it can also be linked to the positive impact of FDI inflow. However, this motive also has its negative aspects, because foreign investors, after spending the monetary incentives, can go to another destination without any consequences, which ten foreign investors have already done in Serbia.

## REFERENCES

- [1] Alfaro, L., Chanda, A., Kalemli-Ozcan, S., Sayek, S. (2002). FDI and Economic Growth: The Role of Local Financial Markets. (Available at: <http://www.people.hbs.edu/lalfaro/JIEfinal1.pdf>).
- [2] [2] Balasubramanyam, V.N., Salisu, M., ve Sapsfort, D. (1996). Foreign Direct Investment and Growth in EP and is Countries. *The Economic Journal*. 106 (434), 92 – 105.
- [3] Basu, P., Guariglia, A. (2007). Foreign Direct Investment, Inequality and Growth. *Journal of Macroeconomics* 29, 824 – 839.
- [4] Basu, P., Chakraborty, C., Reagle, D. (2003). Liberalization, FDI, and Growth in Developing Countries: A Panel Cointegration Approach. *Economic Inquiry*. 41(3), 510 – 516.
- [5] Bengoa, M., Sanchez – Robles, B. (2003). Foreign Direct Investment, Economic Freedom and Growth: New Evidence from Latin America. *European Journal of Political Economy*. 19, 529 – 545.
- [6] Beslac, M. (2022): *International Economics*, Faculty of Business Economics and Entrepreneurship, Belgrade.
- [7] Beslac, M. (2006) Volume of FDI in Southeast Europe and the Economy of SCG, *Economic Annals*, Belgrade, January-March, Belgrade Faculty of Economics.
- [8] Borensztein, E., Gregorio, J-De., Lee, J.W. (1998). How does Foreign Direct Investment Affect Economic Growth? *Journal of International Economics*. 45, 115 – 135.
- [9] Bornschier, V., Chase-Dunn, C., Rubinson, R. (1978). Cross-national Evidence of the Effects of Foreign Investment and Aid on Economic Growth and Inequality: A Survey of Findings and a Reanalysis, *The American Journal of Sociology*. 84(3), 651 – 683.
- [10] De Mello, L. R. (1999). Foreign Direct Investment-Led Growth: Evidence From Time Series and Panel Data. *Oxford Economic Papers*. 51, 133 – 151.
- [11] Durham, J.B. (2004). Absorptive Capacity and the Effects of Foreign Direct Investment and Equity Foreign Portfolio Investment on Economic Growth. *European Economic Review* 48, 285 – 306.
- [12] Duttaray, M. (2001). Essays on Foreign Direct Investment and Growth: Causality and Mechanism. Firebaugh, G. (1992). *The American Journal of Sociology*. 98(1), 105 – 130.
- [13] Djordjevic, A. (2015), *Transnational Companies and the Effects of Their Business Operations on Economy of Serbia*, Banking number 1.
- [14] [14] Güner, Ü., Yılmaz, M. (2007). The Effect of FDI on Economic Growth: A Panel Data Evidence for Developing Countries (1993 – 2004). *Akademik Araştırmalar Dergisi*. Sayı 34, 1 – 13.
- [15] Hansen, H., Rand, J. (2006). The Causal Links Between FDI and Growth in Developing Countries. University of Copenhagen and Development Economics Research Group. Copenhagen.
- [16] Hermes, N., Lensink, R. (2003). Foreign Direct Investment, Financial Development, and Economic Growth. *Journal of Development Studies*. 40 (1), 142 – 163.
- [17] Hsiao, F.S.T., Hsiao, M-C.W. (2006). FDI, Exports and GDP in East and Southeast Asia Panel Data Versus Time-Series Causality Analysis. *Journal of Asian Economics* 17., 1082 – 1106.
- [18] Hyun, H-J. (2006). *Foreign Direct Investment and Economic Growth in Developing Countries*. Indiana University.
- [19] Ignjatijevic, S. (2015): *Economic Analysis of the Importance of Foreign Direct Investments*, Oditor).
- [20] Johnson, A. (2006). The Effects of FDI Inflows on Host Country Economic Growth. CESIS Electronic Working Paper Series. Paper No. 58.
- [21] Kovac, O. (1994): *Balance of Payments and International Finances*, Ces Mecon
- [22] Li, X. and Liu, X. (2005). Foreign Direct Investment and Economic Growth: An Increasingly Endogenous Relationship. *World Development*. 33(3), 393 – 407.
- [23] Menzinger, J. (2003). Does Foreign Direct Investment Always Enhance Economic Growth? *KYKLOS*. 56, 491 – 508.
- [24] National Bank of Serbia. (2021). FDI Inflow in Serbia, available at: NBS | National Bank of Serbia (nbs.rs)
- [25] Papanek, G. V. (1973). Aid, Foreign Private Investment, Savings and Growth in Less Developed Countries. *The Journal of Political Economy*. 81(1), 120 – 130.
- [26] Randjelovic, S., Martinovic, N. (2022):, National competitiveness and foreign direct investment in Europe, *Economic themes*
- [27] Stefanovic M. 2008. The Impact of Direct Investments on the Development of the National Economy, *Economic topics* number 2. Faculty of Economics, Nis.
- [28] Susic, M., Spasojevic B. (2016): *Business studies*, University of Business Studies Banja Luka.
- [29] Vukovic, D., Radulovic D., Djukic M., (2013), The Impact of the Economic Crisis on Investment Flows and Changes in Their Structure, *Limes plus* number 3.
- [30] Zhang, K. H., Ram, R. (2002). Foreign Direct Investment and Economic Growth: Evidence from Cross-Country Data for the 1990s. *Economic Development and Cultural Change*. 51, 205.
- [31] World Bank. (2022). *Doing Business*, 2022

**Article history:**

Received 29 November 2022

Accepted 3 October 2023

# ECONOMETRIC ANALYSIS OF THE COVID-19 PANDEMIC IMPACT OF THE ON FOREIGN INVESTORS PARTICIPATION IN STOCK TRADING IN THE REPUBLIC OF SERBIA

**BARJAKTAROVIĆ Miljana<sup>1</sup>, STANKOVIĆ Sunčica<sup>2</sup>, MILOJEVIĆ Nataša<sup>3</sup>**

<sup>1,2,3</sup>Faculty of Business Economics and Entrepreneurship, Belgrade (SERBIA)

E-mails: miljana.barjaktarovic@vspep.edu.rs; suncica.stankovic@vspep.edu.rs; natasa.milojevic@gmail.com

## ABSTRACT

*The purpose of this research is to investigate how the Covid-19 epidemic has affected foreign investors' involvement in stock trading in the Republic of Serbia. Through the use of panel regression analysis, the empirical results obtained for the period of January 2021 to March 2022 demonstrate a negative impact of the pandemic on the involvement of foreign investors in stock trading for Covid-19 monthly cases in Serbia and globally, and a positive impact for Covid-19 monthly cases in Europe. The observed results have the potential to enhance comprehension of foreign investors' responses to other potential crises or pandemics, in addition to the Covid-19 pandemic.*

**Keywords:** Foreign investors, Belgrade Stock Exchange, panel regression analysis.

**JEL:** F20

**DOI:** 10.5937/intrev2304143B

**UDC:** 339.727.22(497.11)"2021/2022"

336.76-042.3:616-036.21

**COBISS.SR-ID** 133922569

## INTRODUCTION

According to the relevant literature, the role of foreign investors in share trading is very important when taking into account that they have a significant stake in numerous companies [1], their potential role in determining prices ([2], [3]), as well as their role in stabilizing the market ([4], [5]). Namely, Bae et al. [2] believe that with the help of foreign investors, the spread of information from the global market to share prices can be facilitated. The relevant literature also suggests that foreign investors may change their trading behavior when faced with a crisis ([6], [7]), such as the Covid-19 pandemic [1].

This paper examines the empirical effects of Covid-19 on foreign investors' participation in share trading on the Belgrade Stock Exchange, with a focus on the impact on participant behavior in the Serbian capital market. The impact on behavior in general has not received enough attention in the literature. The purpose of the study, according to the subject, is to ascertain how the Covid-19 epidemic has affected foreign investors' involvement in share trading in the Republic of Serbia. To address the stated purpose, the paper is structured into four sections. The first part includes introductory considerations. In the second part, a review of the relevant literature is made. The third part covers the methodology. In the last part, the conclusion, the key conclusions of the research are presented and guidelines are given to future researchers.

## LITERATURE REVIEW

Cross-border capital investments have grown at an accelerated rate in recent years. On the other hand, economic success entails the establishment of a stable environment for stock market trading, which encourages investors to make confidence investments and results in a predictable environment [8]. According to Le et al. [9], foreign investors may be to blame for the stock market's instability in developing nations that are experiencing a crisis. Many writers ([10] [11] [12][13] [14]) address different facets of the capital market, financial instruments, and investment performance; researchers ([15] [16] [17] [18][19][20][21] [22]) have focused a great deal of attention on the effect of Covid-19 on these markets' volatility. However, the existing literature does not offer clear enough evidence on whether there is an outflow of foreign capital in conditions of a pandemic or crisis from the perspective of developing countries. Borensztein and Gelos [23], for example, suggest that foreign investors have less information, which makes them prone to panic.

The goal of Naseem et al.'s study [24] was to examine investor and stock market psychology during the Covid-19 pandemic. According to their findings, there is a negative correlation between investor psychology and certain stock markets. This is because investors may decide to sell their stock market assets due to unfavorable feelings related to the pandemic, which could lower stock market returns.

Zhang et al. [25] sought to ascertain the effect of the pandemic on the trading behavior of international institutional investors in the first half of 2020. They did this by analyzing data on the daily trade of these investors in China and data on Corona-19 virus cases in six different countries. The study's conclusions indicate that, in five of the eleven sectors that were examined, the dominating "push factor" of Covid-19 in the home country was responsible for the decline in net foreign inflows; in contrast, in the majority of sectors, the overwhelming "pull factor" of local returns was responsible for the explanation of net foreign inflows. Furthermore, there is a direct correlation between the pandemic and the formation of herds among participants in the global financial market, as per the findings of the study conducted by Bouri et al. [26], which sought to investigate the impact of the Covid-19 pandemic on the herding behavior of investors in the global stock market. Also, there is evidence of synchronization between the G7 countries and the global market in the association between pandemic uncertainty and stock market activity (after adjusting for FERAS emotion) [27].

## METHODOLOGY

### Data Collection and descriptive analysis results

The research involving the participation of foreign investors in stock trade used monthly data from January 2021 to March 2022, while the number of observed entities was four (FIS – foreign investors participation in overall stock trading, b-FIS – foreign investors participation in overall stock trading – buy-side, s-FIS – foreign investors participation in overall stock trading – sell-side, and FIT – foreign investors participation in overall trading). The total number of observations is 60. The Belgrade Stock Exchange website provided information on foreign investors trading, while the web portal Our World in Data provided data on Covid-19 daily cases.

*Table 1. Description of the Regression Analysis's Variables*

Variable	Description	Source
Foreign investors participation in total stock turnover- <i>FIS</i>	Monthly data in % - Feb. 2021 – Apr 2022	Belgrade Stock Exchange <a href="https://www.belex.rs/eng/trgovanje/ucesce_stranaca">https://www.belex.rs/eng/trgovanje/ucesce_stranaca</a>
Foreign investors participation in total stock turnover - buy side - <i>b-FIS</i>	Monthly data in % - Feb. 2021 – Apr 2022	Belgrade Stock Exchange <a href="https://www.belex.rs/eng/trgovanje/ucesce_stranaca">https://www.belex.rs/eng/trgovanje/ucesce_stranaca</a>
Foreign investors participation in total stock turnover - sell side - <i>s-FIS</i>	Monthly data in % - Feb. 2021 – Apr 2022	Belgrade Stock Exchange <a href="https://www.belex.rs/eng/trgovanje/ucesce_stranaca">https://www.belex.rs/eng/trgovanje/ucesce_stranaca</a>
Foreign investors participation in total turnover- <i>FIT</i>	Monthly data in % - Feb. 2021 – Apr 2022	Belgrade Stock Exchange <a href="https://www.belex.rs/eng/trgovanje/ucesce_stranaca">https://www.belex.rs/eng/trgovanje/ucesce_stranaca</a>
New Coronavirus cases in Serbia	Daily data	WHO <a href="https://covid19.who.int/">https://covid19.who.int/</a>
New Coronavirus cases in Europe	Daily data	WHO <a href="https://covid19.who.int/">https://covid19.who.int/</a>
New Coronavirus cases in the World	Daily data	WHO <a href="https://covid19.who.int/">https://covid19.who.int/</a>

The research's dependent variable is the involvement of foreign investors in stock trading. The average monthly count of corona virus infections in Serbia, Europe, and world are independent variables in the research. Table 1 lists the variables that were used in the regression analysis and their descriptions.

*Table 2. Descriptive statistics*

Variable	Obs.	Mean	Std. Dev	Min	Max
Foreign investors trading	60	13.69	16.26	.27	90.33
Serbia	60	2131.867	1.563.360	136	5969
Europe	60	253221.6	142174.81	52740	520219
World	60	578822.5	133743.9	375869	793448

Source: Authors' calculation

Table 2 provides the descriptive statistics for the variables utilized in the analysis. It displays information on the quantity of observations as well as the computed values of the variabilities and measures of central tendency.

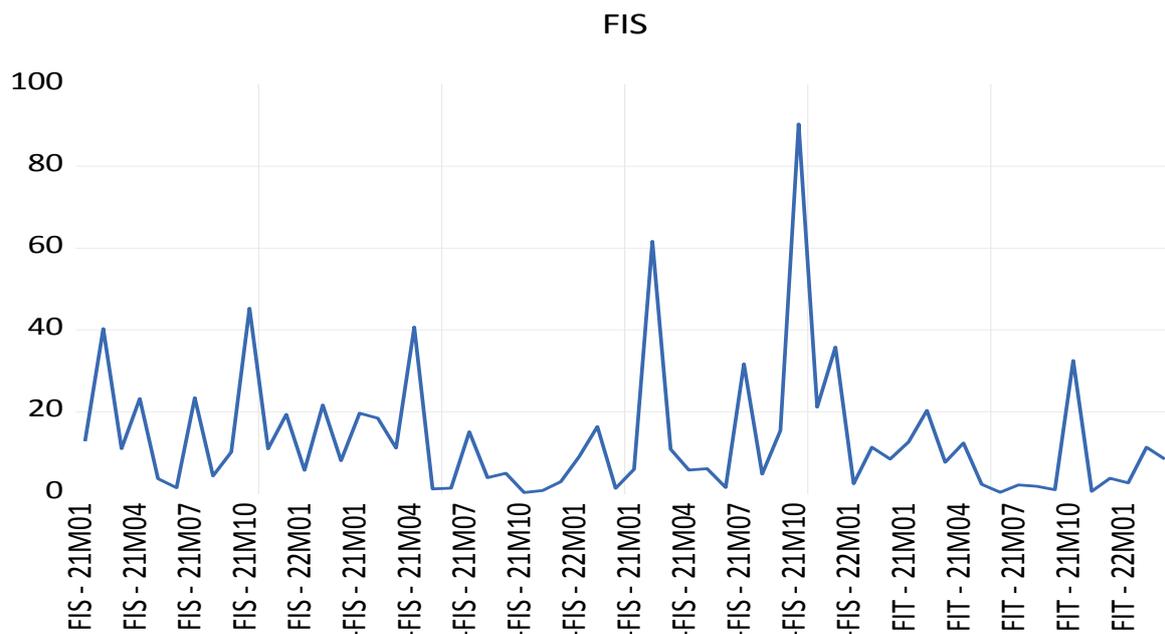


Fig. 1. Participation of foreign investors during the observed period  
 Source: Authors, based on EViews 12

Fig. 1 presents the movement of foreign investors’ participation in stock trading during the observed period. The s-FIS graphics, which depict the involvement of foreign investors in sell-side stock trading, demonstrate increased activity in stock selling on the Belgrade Stock Exchange during the first half of the pandemic and in the second half of 2021, with a peak participation rate of 45.3% in October 2021 (Table 3). Such trading activity is associated with initial panic on the market, fear of loss, and investors’ psychology over several periods, so-called pandemic *peaks*.

Table 3. Foreign investors participation in stock trading (in %)

m/y	FIS	b-FIS	s-FIS	FIT
Jan. 21	12.80	19.65	5.95	12.64
Feb. 21	<b>40.03</b>	18.42	<b>61.65</b>	20.34
Mar. 21	11.00	11.16	10.83	7.66
Apr.21	23.22	40.71	5.74	12.35
May.21	3.63	1.16	6.10	2.27
Jun. 21	1.43	1.37	1.50	0.31
Jul. 21	23.41	15.11	31.70	2.13
Aug. 21	4.34	3.90	4.78	1.81
Sep. 21	10.17	4.97	15.37	0.95
Oct. 21	<b>45.30</b>	0.27	<b>90.33</b>	32.51
Nov.21	10.93	0.76	21.11	0.56
Dec. 21	19.36	2.90	3.82	3.75
Jan.22	5.71	9.01	2.41	2.61
Feb.22	21.66	16.35	26.98	11,34
Mar.22	8.06	1.30	14.83	8.46

Source: Belgrade Stock Exchange (2022)

Research methods are based on regression models of strongly balanced panel data. The least-squares (POLS), random-effect (RE), and fixed-effect (FE) models were used for testing the assumed relationships.

## ANALYSIS RESULTS

Econometric tests were used to evaluate the model, with the dependent variable foreign investors' participation in stock trading (FI) as the linear stochastic function of the independent variables (new average monthly coronavirus cases in Serbia, Europe, and the world):

$$FI_{it} = \alpha_i + \beta_1 S + \beta_2 E + \beta_3 W + u_i + e_{it} \quad (1)$$

where:  $FI_{it}$  - foreign investors' participation in stock trading (dependent variable);  $i$  - entity (1 = FIS; 2 = b-FIS; 3 = s-FIS; 4 = FIT);  $t$  - time (1 = January 2021... 15 = March 2022);  $\alpha$  - intercept;  $\beta$  - coefficient of the respective independent variables;  $S$  - new average monthly coronavirus cases in Serbia (independent variable);  $E$  - new average monthly coronavirus cases in Europe (independent variable);  $W$  - new average monthly coronavirus cases in the world (independent variable);  $u_i$  - individual impact of the  $i^{\text{th}}$  entity; and  $e_{it}$  - error term.

Before choosing the appropriate model (POLS, RE or FE), the normality of residuals was tested. Results of testing for normality of residuals (Fig. 2) show that the residuals have a normal distribution, considering that the Jarque-Bera test result is 2.53, with a significance level above 0.05.

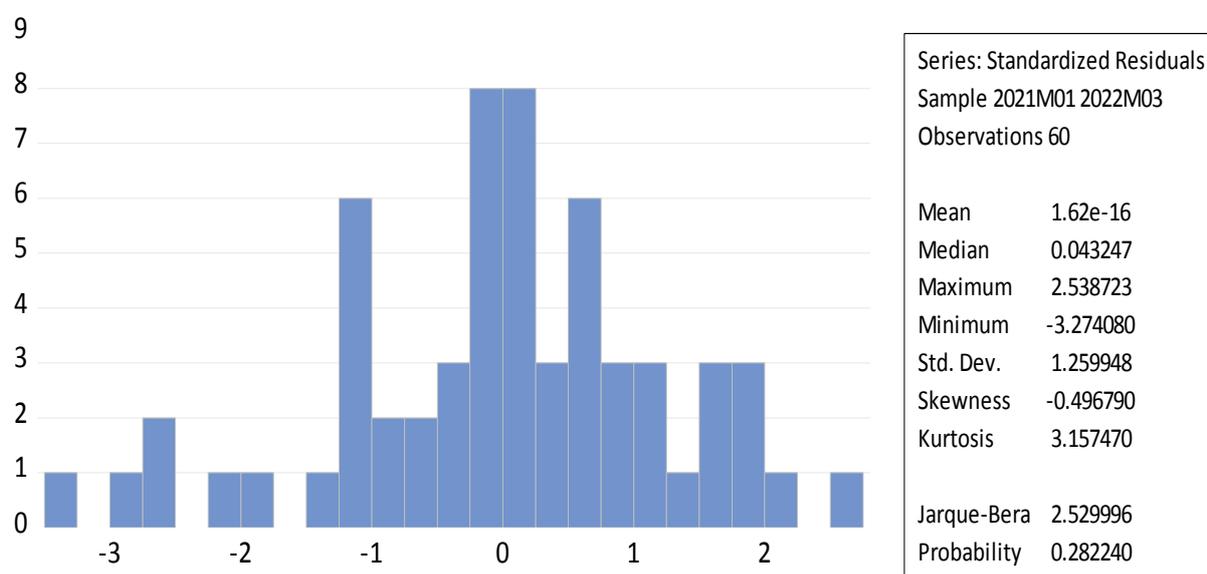


Fig 2. Results of testing for normality of residuals

The best suitable model was determined to be the POLS model. Table 4 indicates that the independent variable's parameters are statistically significant. The value of the determination coefficient shows that 11 % of dependent variable variations are explained by each of the models ( $R^2=0.11$ ). Based on the value of the coefficient of determination, it can be concluded that the participation of foreign investors in stock trading in Serbia is influenced by other important factors, not only the Covid-19 pandemic. To opt between the FE and POLS models Chow test was run. The Chow test values ( $F(3,53)=2.254418$ ;  $p = 0.0927$ ) suggest statistical insignificance, and the null hypothesis cannot be rejected, that is, the POLS model has an advantage over the FE model. After that, we checked whether the POLS model is more appropriate for the data research than the RE model. We do Lagrange multiplier tests for random effects to determine which of the two is more likely to result in the panel effect in the model. The findings ( $\chi^2(01) = 1.042549$ ;  $\text{Prob} > \chi^2 = 0.3072$ ) allow us to conclude that the spatial dimension outperforms the time dimension in the POLS model. We used the Ramsey RESET test to see if the model omitted any important variables. Gained values ( $F(3,53) = 2.56$ ;  $\text{Prob} > F=0.0650$ ) suggest that the model is well specified. The heteroskedasticity of the model was tested using White's test. The homoskedasticity of the model errors is confirmed by the probability value, which is  $\chi^2(9) = 12.13$ ;  $\text{Prob} > \chi^2 = 0.2060$ . Table 4 displays the outcomes of additional diagnostic test results.

The POLS model results indicate that trading involvement by international investors and infected cases in Serbia are negatively correlated and not statistically significant. Furthermore, in keeping with the findings, the number of newly infected people worldwide increases as foreign investors' involvement

in the Belgrade stock market decreases. This negative but significant correlation between the two variables indicates that foreign investors' involvement in the market is related to the number of newly infected individuals worldwide. However, trading by foreign investors on the Belgrade stock market is strongly connected, at a statistically significant level, with the number of illnesses in Europe; that is, as infections rise, so does trading by foreign investors.

**Table 4. Diagnostic tests, POLS, RE, and FE model evaluation with FI dependent variable**

FI	POLS		RE		FE	
	Coef.	t	Coef.	t	Coef.	t
Serbia	-.000167	-.126**	-.000167	-0.130**	-.000167	-.130**
Europe	3.82E-05	2.034*	3.82E-05	2.101*	3.82E-05	2.101*
World	-5.10E-05	-2.532*	-5.10E-05	-2.615*	-5.10E-05	-2.615*
Constant	33.87284	3.264*	33.87284	3.293*	33.87284	3.371*
R <sup>2</sup>	.11		.11		.21	
F	2.35*		2.31*		2.33*	
Root MSE	14.23		14.54		14.35	
Number of obs.	60		60		60	
$FIS = 33.8728388046 - 0.000167016400211 * Serbia + 3.8174508275e05 * Europe - 5.09616053113e05 * World (2)$						
<b>Diagnostic tests</b>						
Chow test					p = .0927	
LM test					p = .3072	
Hausman test					$\chi^2(3) = .0000$ ; p = 1.0000	
LR Test					$\chi^2(4) = 6.66467$ ; p = .22	
Breusch-Pagan-Godfrey test					$\chi^2(3) = 3.366334$ ; p = .09	
Breusch-Pagan LM					$\chi^2(6) = 4.810598$ ; p = .5683	
Pesaran scaled LM					$\chi^2(6) = .343351$ ; p = .7313	
Pesaran CD					$\chi^2(6) = .769394$ ; p = .4417	

Note: \* - statistical significance of 5%; \*\* - not significant

Source: Authors' calculation

The model does not exhibit detrimental multicollinearity issues based on Table 5 results, as all variables in the VIF column have coefficients less than 10 and higher than 0.1 in the 1/VIF column.

**Table 5. The VIF test**

Variable	VIF	1/VIF
Serbia	1.30	0.770443
Europe	1.30	0.771488
World	1.02	0.978907
Mean VIF	1.21	

Source: Authors' calculation

## CONCLUSION

The study's objective was to investigate how the Covid-19 epidemic affected foreign investors' involvement in share trading in Serbia. The POLS model is the best fit model for the analysis. According to the findings, there is a negative correlation—though not a statistically significant one—between commerce with foreign investors and Covid-19 infections in Serbia. The same statistics also show a statistically significant negative correlation between the number of affected people worldwide and foreign investors. Conversely, there is a statistically significant positive correlation between the number of diseases in Europe and the trade of foreign investors. The acquired results cannot be compared to other studies' findings since, to the best of the authors' knowledge, other studies did not examine these correlations in this manner.

The results of this study can be used to better understand how foreign investors are reacting to the Covid-19 outbreak and other possible crises. Nevertheless, the results obtained are limited to the foreign investors' involvement in stock trading within the Republic of Serbia. In this way, later researchers might examine foreign investors' involvement in other nations and contrast their findings with those of the current investigation.

## REFERENCES

- [1] Bing, T., and Ma, H. (2021). COVID-19 pandemic effect on trading and returns: Evidence from the Chinese stock market. *Economic Analysis and Policy* 71, pp. 384-396.
- [2] Bae, K.-H., Ozoguz, A., Tan, H., and Wirjanto, T.S. (2012). Do foreigners facilitate information transmission in emerging markets? *Journal of Financial Economics* 105(1), pp. 209-227.
- [3] Shive, S. (2012). Local investors, price discovery, and market efficiency. *Journal of Financial Economics* 104(1), pp. 145-161.
- [4] Burch, T.R., Emery, D.R., and Fuerst, M.E. (2016). Who Moves Markets in a Sudden Marketwide Crisis? Evidence from 9/11. *Journal of Financial and Quantitative Analysis* 51(2), pp. 463-487.
- [5] Huang, E.J. (2015). The role of institutional investors and individual investors in financial markets: Evidence from closed-end funds. *Review of Financial Economics* 26, pp. 1-11.
- [6] Giudice, A.D., and Paltrinieri, A. (2017). The impact of the Arab Spring and the Ebola outbreak on African equity mutual fund investor decisions. *Research in International Business and Finance* 41, pp. 600-612.
- [7] Hood, M., Kamesaka, A., Nofsinger, J., and Tamura, T. (2013). Investor response to a natural disaster: Evidence from Japan's 2011 earthquake. *Pacific-Basin Finance Journal* 25, pp. 240-252.
- [8] Wendt, K. (2017). Social Stock Exchanges - Democratization of Capital Investing for Impact. 30th Australasian Finance and Banking Conference 2017.
- [9] Li, D., Nguyen, Q., Pham, P.K., Wei, S.X. (2011). Large foreign ownership and firm-level stock return volatility in emerging markets. *The Journal of Financial and Quantitative Analysis* 46(4), pp. 1127-1155.
- [10] Kirillova, O.Y., and Emelyanova, E.S. (2021). Risk Management of Derivative Financial Instruments. *International Review* 1-2, pp. 89-98.
- [11] Korenak, B., Stakic, N. (2022). Investment Performance Attribution of the U.S. Small-Size Value Mutual Funds Using Fama-French Five-Factor Model. *International Review* 1-2, pp. 17-23.
- [12] Borjigin, S., Gao, T., Sun, Y., and An, B. (2020). For evil news rides fast, while good news baits later?—A network based analysis in Chinese stock market. *Physica A: Statistical Mechanics and its Applications* 551, pp. 1-18.
- [13] Živković, A. (2022). Forecast of Belex15 and Belexline Movement Using ARIMA Model. *Economic Analysis* 55(1), pp. 90-104.
- [14] Marjanović, M., Mihailovic, I., and Dimitrijević, O. (2021). Interdependence of stock exchange indices from leading capital markets: USA, Germany and Japan Stock Market. *BizInfo (Blace) Journal of Economics, Management and Informatics* 12(1), pp. 15-28.
- [15] Dai, P.-F., Xiong, X., Liu, Y., Huynh, T.L.D., and Sun, J. (2021). Preventing crash in stock market: The role of economic policy uncertainty during COVID-19. *Financial Innovation* 7(31), pp. 1-15.
- [16] Đorđević, B., and Stanković, S. (2022). Covid-19 and Serbian Stock Market Response: A Panel Data Approach. *Economic Analysis* 55(2), pp. 20-30.
- [17] Đorđević, B., and Stanković, S. (2022). The COVID-19 Pandemic, Government Response, and Serbian Stock Market: Evidence from ARDL Cointegration Model. 6th International Scientific Conference on Economics & Management - EMAN 2022, March 24, 2022. Ljubljana, Slovenia (online/virtually). EMAN 2022 -Selected Papers, pp. 59-69.

- [18] Đorđević, B., and Stanković, S. 2021. Analiza uticaja pandemije COVID-19 na volatilnost srpskog tržišta kapitala. Zbornik radova 11. Međunarodnog simpozijuma o upravljanju prirodnim resursima, Fakultet za menadžment, Zaječar, pp. 90-97.
- [19] Đorđević, B., and Stanković, S. 2021. Uticaj covid-19 na tržište akcija Beogradske berze: Panel regresiona analiza. V Međunarodna naučno-stručna konferencija Regionalni razvoj i prekogranična saradnja, Pirot, decembar 2021. Zbornik radova: Regionalni razvoj i prekogranična saradnja, pp. 543 – 555.
- [20] Ali, M., Alam, N., and Rizvi, S.A.R. (2020). Coronavirus (COVID-19) — An epidemic or pandemic for financial markets. *Journal of Behavioral and Experimental Finance* 27, 100341.
- [21] Bai, L., Wei, Y., Wei, G., Li, X., and Zhang, S. (2021). Infectious disease pandemic and permanent volatility of international stock markets: A long-term perspective. *Finance Research Letters* 40, 1-10.
- [22] Khalid, N., Zafar, R.F., Syed, Q.R., and Bhowmik, R. (2021). The Heterogeneous Effects of COVID-19 Outbreak on Stock Market Returns and Volatility: Evidence from Panel Quantile Regression Model. *Etikonomi* 20(2), pp. 225–238.
- [23] Borensztein E., and Gelos R.G. (2003). A panic-prone pack? The behavior of emerging market mutual funds. *IMF Staff Papers* 50(1), pp. 43–63.
- [24] Naseem, S., Mohsin, M., Hui, W., Liyan, G., and Penglai, K. (2021). The Investor Psychology and Stock Market Behavior during the Initial Era of COVID-19: A Study of China, Japan, and the United States. *Frontiers in Psychology* 12, 626934.
- [25] Zhang, J., Mao, R., Wang, J., and Xing, M. (2021). The way back home: Trading behaviours of foreign institutional investors in China amid the COVID-19 pandemic. *Pacific-Basin Finance Journal* 68, 101618.
- [26] Bouri, E., Demirer, R., Gupta, R., and Nel, J. (2021). COVID-19 Pandemic and Investor Herding in International Stock Markets *Risks* 9, 168.
- [27] Dash, S.R., and Maitra, D. (2022). *The North American Journal of Economics and Finance*. 62, 101712.

**Article history:**

Received 16 June 2022

First revision 1 November 2022

Accepted 13 January 2023

# DIGITAL TRANSFORMATION OF BUSINESS THROUGH E-COMMERCE IN SMALL AND MEDIUM-SIZED ENTERPRISES (SME'S)

JAKŠIĆ Krsto<sup>1</sup>, TRAJKOVIĆ Slaviša<sup>2</sup>, DELETIĆ Milan<sup>3</sup>, DELETIĆ Velimir<sup>4</sup>

<sup>1,2</sup>Faculty of Economics, University of Priština with temporary base in Kosovska Mitrovica (SERBIA)

<sup>2,4</sup>Toplica Academy of Applied Studies, Department of Business Studies Blace, Blace (SERBIA)

E-mails: [krsto.jaksic@gmail.com](mailto:krsto.jaksic@gmail.com), [tslavisa@gmail.com](mailto:tslavisa@gmail.com), [mdeletic@yahoo.com](mailto:mdeletic@yahoo.com), [velimir.deletic@yahoo.com](mailto:velimir.deletic@yahoo.com)

## ABSTRACT

*The crisis caused by Covid-19 confirmed that only those companies that are able to quickly and efficiently transform their business, first of all, by applying and using digital technologies, can be competitive and survive on the market. The paper analyzes the percentage of companies that apply digital tools through electronic sales and trade in the Republic of Serbia and neighboring countries, both full members of the EU and candidate countries for the EU. Using Eurostat data, it was shown the percentage of companies that made e-sales, then the percentage of turnover from e-commerce, as well as the percentage of companies that made sales through their own websites in pre-crisis 2019 as well as in the years after it. The results show that in terms of e-commerce, Serbia achieved the best results in 2019 and that it is above the average of the Western Balkans countries, as well regarding the percentage of turnover from e-commerce Serbia is far below the average of EU countries and countries of the Western Balkans, while in terms of web sales via its own website, Serbia is above the average of the Western Balkans countries.*

**Keywords:** transformation, business, e-commerce, SME`s

**JEL:** L26

**DOI:** 10.5937/intrev2304151J

**UDC:** 004.738.5:339

**005.591.6:334.713(497-15)"2019/2022"**

**COBISS.SR-ID 133924105**

## INTRODUCTION

Today, small and medium enterprises (SME's) are the backbone of the economic development of almost all countries of the world. Their role is primarily reflected in employment, creation of additional value, as well the introduction of innovations. According to the World Trade Organization, small and medium-sized enterprises (SMEs) account for more than 90 percent of the world's business fabric, 55 percent of the GDP of developed economies and employ 60-70 percent of the working population [1]. In turbulent environment and business conditions, and especially with the latest crisis caused by COVID-19, the digitization process is simply inevitable.

The Covid-19 crisis has shown that only those companies that are able to transform their business (primarily by using digital platforms) quickly and effectively are able to survive on the market. One of the major challenges for firms today is to adapt to technological development and embrace the ongoing industrial revolution which has mainly a digital nature[2]. One of the most effective strategies to pursue this goal is to engage in digital export, i.e., using e-commerce to access new international markets [3]. Gurbaxani and Dunkle [4] find that there are six dimensions of digital transformation, namely: strategic vision, culture of innovation, know-how and intellectual property, digital capability, strategic alignment, and technological assets. The latter ones entail the digital technologies underpinning the digital transformation including internet and wireless communication, mobile technologies, cloud computing, data mining, big data, etc. Interestingly, digital capabilities differ from technological assets and involve: (1) availability of digital expertise; (2) visionary/innovative skills within the company to define the right digital strategy; (3) systems of grading and incentives based on individuals' level of digital transformation knowledge; (4) technical talent for innovation; and (5) digital skills to execute the digital strategy.

In the context of commercializing disruptive technologies, small and medium enterprise (SME) entrepreneurship has been experiencing several entangled challenges [5]. The emergence of Industry 4.0 and the abrupt outbreak of the COVID-19 apocalypse have radically changed the business environment. The unprecedented situation has raised a question as to whether it will be possible for SME entrepreneurs to continue to play a decisive role in such an emerging business landscape [6]. To adopt such groundbreaking technologies, SME entrepreneurship requires managerial, financial, and technological competencies [7][8]. SME entrepreneurship needs to adjust and resettle the existing skill sets and expertise in a fast-paced environment. Quickly accepting and using new technology has been found to frustrate entrepreneurs of SMEs, impeding their motivation to take technology initiatives [9][10][11][12]. But whatever may be the challenges [7], SME entrepreneurship has benefitted from the emergence of several digital technologies, like the Internet of Things (IoT), blockchain, artificial intelligence (AI), social media, additive manufacturing process, and so on [13] [14][15][16][17][12]. Digital platforms are technological platforms that allow firms to edit, homogenize, and distribute data on a huge scale [18][19]. By using digital platforms, SME entrepreneurship has ventured to compete in the markets which were diachronically reserved for large enterprises [20][21][22]. Adoption of digital technologies has helped SME entrepreneurs to establish direct linkage between suppliers and buyers, to effectively entice the right investors through crowdsourcing and crowdfunding, to engage intimately with potential customers, and to use data more efficiently[23][24].

The paper will show the percentage of companies engaged in e-commerce in Serbia for the last four years, as well as a comparative analysis with the average percentage of e-commerce companies at the level of the European Union (EU) as well as neighboring countries using EUROSTAT data. Countries from the surrounding area that are members of the EU such as Croatia, Hungary and Romania, as well as the countries of the Western Balkans that are candidates for EU membership were taken as rapper countries, except for Albania and North Macedonia, for which there was not enough data. The goal is to show e-commerce in 2019, which is before the Covid crisis, as well as in 2020, during the crisis and the year after the crisis.

## DIGITAL TRANSFORMATION

With the Internet and the Web playing an increasingly important role in the world economy, the integration and adoption of new digital technologies is the major challenge for businesses today, observing the effects of Digital Transformation (DT) in all industries and all types of organization. Organizations that do not take advantage of this moment to evolve and transform digitally are in danger

of disappearing or being overtaken by more agile organizations [25]. Digital transformation is the way in which “a firm employs digital technologies, to develop a new digital business model that helps to create and appropriate more value for the firm” [26]. Such transformation affects business processes, operational routines, and organizational capabilities.

Interest in DT has increased in recent years, being one of the most important topics in management research and the business world [27]. DT does not have a unique definition, and there are different perspectives in academic literature, with common concepts and ideas, which are considered and accepted as typical definitions of DT. New digital technologies are the foundation of DT, including various types of technology such as data analysis and management (Big Data), automaton robots, simulation, horizontal and vertical systems integration, Internet-of-Things (IoT), cybersecurity, cloud computing, 3D printing, and augmented virtual reality. Digitization or DT can help companies gain competitive advantages by improving their organizational flexibility, resilience and enhancing their dynamic capacity [28]. In the same article Guo, 2020 indicates the possible benefits of digitization for the dynamic capacities of companies:

- Help predict or feel external environmental changes at a reduced cost.
- Allows better use of the business opportunity in crises.
- Breaking space and time obstacles by the decentralized nature of digital technologies.
- Allows the reconfiguration of company resources in response to crises.

The COVID-19 pandemic, which has taken society, business and industry by surprise and is likely to cause a global economic downturn [29], had demonstrated that digital tools and connectivity are essential tools and alternatives to their physical equivalents in combating the social and economic effects of the pandemic [30]. DT involves the transformation of processes and products, organizational structures, and management concepts. According to Matt and Hess 2015 “Digital transformation is concerned with the changes caused by digital technologies in the business model of companies, resulting in changes in products or the structure of the organization or the automation of processes.” [31] mention that digital technologies can be viewed as “combinations of information, computing, communication, and connectivity technologies,” which together transform business strategy and processes. von Briel et al. [32] suggest that digital technologies act as external enablers, providing a “potentially paradigm-shifting role”. In examining the potential impact of digital technologies in venture creation, von Briel et al. [32] identify six underlying mechanisms at play: (i) compression, which reduces the amount of time required to perform an action; (ii) conservation, which reduces the extent of resources required to perform an action; (iii) expansion, which increases the availability of a resource; (iv) substitution, which allows for replacing one resource with another; (v) combination, allowing for bundling of different resources to create new artifacts and combinations; and (vi) generation, which creates new artifacts by changing existing ones.

## **SMALL/MEDIUM ENTERPRISES AND DIGITALIZATION**

SMEs play a vital role in promoting technological innovation, offering jobs, and maintaining social stability. However, due to a lack of resources, SMEs are more vulnerable to public crises than other companies, and therefore need digital technologies to reduce this vulnerability as has happened with many SMEs in the pandemic crisis caused by COVID-19 [28]. Traditional retail companies to remain competitive must react to behavioral changes [33] derived from the use of digital technologies, as the majority of consumers have changed their shopping habits and turned to online commerce and services [34]. SMEs need to adapt to digital trends (Viswanathan and Telukdarie, 2019) that will possibly govern the culture and work organization of companies.

In general, for small and medium enterprises (SMEs), new digital technologies bring both promises and pitfalls [35]. As digital technologies and business models become more pervasive, they disrupt older legacy technologies, business models, operational processes, and partner relationships, leading to both new opportunities and challenges for the firm. On the one hand, digital technologies enable new venture creation process [32], allow organizations to create greater customer value through novel resource combinations [36][37] [38], enhance traditional manufacturing [39], improve product and process innovation [40][41], and speed up servitization [42]. On the other hand, digital technologies are challenging to adopt, mainly because of the SME’s inability to quickly and effectively migrate from old technologies and business models to new ones [43]. Digital transformation of small firms remains under researched, especially the specific ways in which digital technologies spur innovation and disruption in small firms[44].

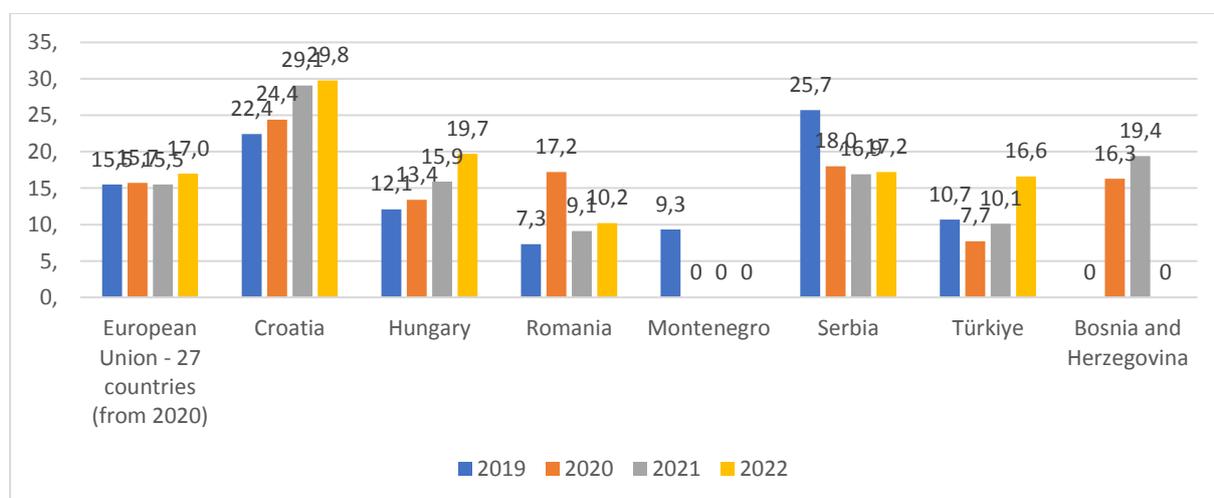
For SMEs operating within the broader entrepreneurial ecosystem [45][46][47], digital transition during a crisis can be especially challenging. In general, digital technologies transform the nature of uncertainty inherent in the entrepreneurial processes and outcomes, making the transition daunting [48]. The problem is exacerbated during a crisis when current ways of operating are either no longer effective or have to be forsaken, leading many firms to shy away from taking any innovation focused actions (Thorgren & Williams, 2020). At the same time, a recently concluded study of 2,000 U.S. SME owners by the Data Catalyst Institute notes that many of these SMEs actually expanded their use of digital tools during the COVID-19 crisis.

Literature has found that SMEs face increased difficulty in adopting new technologies due to lacking necessary resources, skills, commitment, and proper understanding of digital opportunities [7]. Overcoming these difficulties will require SMEs to build various capabilities. In SMEs, some capabilities (e.g., sensing, searching, and selecting the right source of digital knowledge) reside either in the entrepreneur or in the executive team. The ability to perceive new digital opportunities, to change customers' interactions, and co-create value with them imply changes in existing routines or resource configurations as well as building new capabilities. Filling these gaps is important, because digital technologies are important competitive tools for SMEs, and neglecting them is risky and may seriously compromise firm survival. Digital technologies provide support for value creation and customer engagement, which are critical success factors for SMEs. However, the use of technologies is not without difficulties and requires a change management and vision that have foundations in acquisition of new organizational and marketing capabilities.

## DATA ANALYSIS

A common thread among researchers in developing countries is that E-Commerce is a form of innovation in which parties interact electronically to perform one or more of the following functionalities depending on their contextual resources and constraints: (I) communication, such as delivering information, products/services, or payments via telephone lines, computer networks, or any other means; (II) the application of technology towards the automation of business transactions and workflow; (III) the meeting of the desire of firms, consumers, and management to cut service costs while improving the quality of goods and increasing the speed of service delivery; (IV) the provision of the capability of buying and selling products and information on the Internet and other online services [49][50].

E-commerce adoption can be defined as "set up of a company web site to share information, maintain relationships as well as carry out transaction using electronic networks" [51]. Harrington and Reed identified E-commerce as "the electronic exchange of information, goods, services and payments" while Choi et. al. [52] defined E-commerce as "the utilization of electronic equipment to carry out business". Grandona and Pearson's (2004, pg.197-216) definition of E-commerce as "the process of purchasing and selling products or services using electronic data transmission via the Internet and www."



*Fig. 1. E-commerce sales of enterprises by NACE Rev.2 activity*

The graph shows that the percentage of companies that operated through e-commerce in Serbia is higher than the average of EU countries. It is interesting to note that this percentage is the highest in 2019 at 25.7% and then decreases in 2020. during the COVID-19 crisis, it was 18.0% and stabilized in 2022 at some 17.2%. In relation to the neighboring countries of the EU, we see that Serbia has a tendency to fall, while in these countries the percentage is increasing, except for Romania. Croatia has the highest result, where the rate grows from some 22% in pre-crisis 2019 to almost 30% in 2022. When it comes to the Western Balkans countries, we see that this percentage is growing in Turkey and Bosnia and Herzegovina compared to pre-crisis 2019.

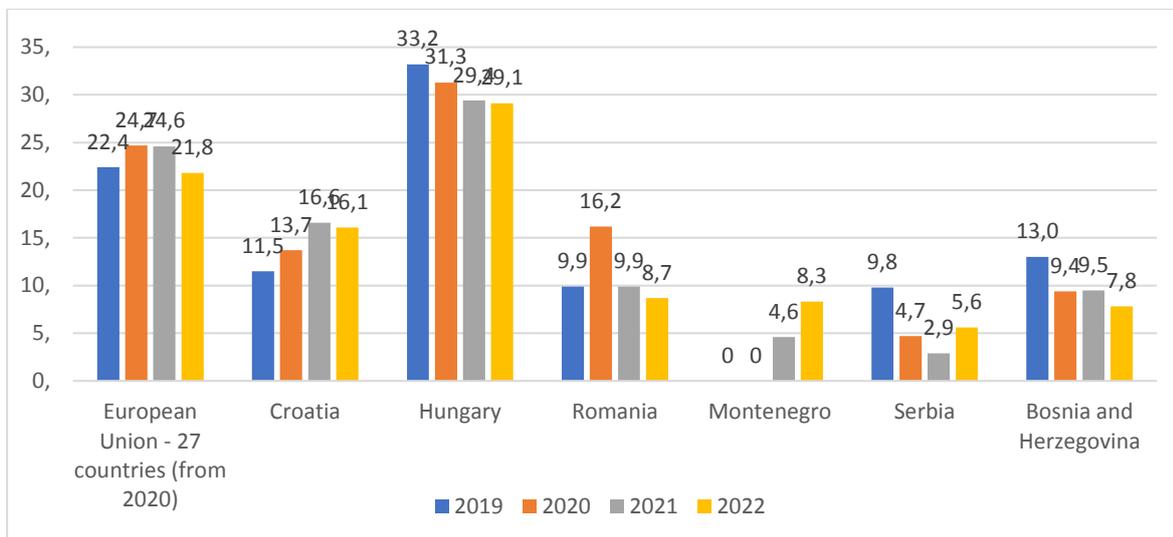


Fig. 2. Value of e-commerce sales by NACE Rev.2 activity

The percentage of turnover achieved by companies through e-commerce is far below in Serbia compared to the EU average. While that average in EU moves over 20%, in all four years in Serbia, it went from 9.8% in the pre-crisis year 2019 to 2.9% in 2021 and jumped slightly in 2022 to 5.6%. When it comes to the neighboring countries of the EU, we see that this percentage is the highest in Hungary and goes from over 33% in 2019 and slightly drops to 29% in 2022, while in Croatia it increases from around 11% to 16% and in Romania hovers around 10%. When it comes to the countries of the Western Balkans, we see that they are on average with Serbia, while BiH is slightly above that.

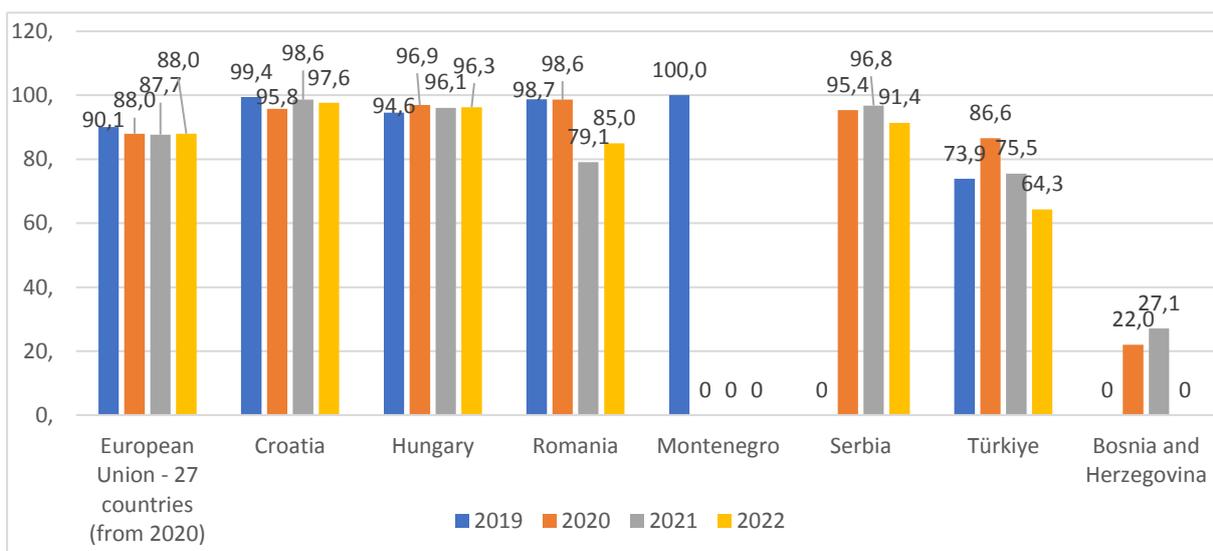


Fig.3. Enterprises with web sales via their own websites or apps

When it comes to the percentage of companies that had web sales through their own websites or applications, we see that Serbia is slightly above the EU average and that percentage ranges from 95% in 2019 and slightly drops in 2020 to 91.4%, while in the EU it is around 90%. When it comes to EU member states from the environment, we see that the average is even around 99% in Croatia, while Hungary is on average with Serbia, while Romania is slightly below. As for the countries of the Western Balkans, we see that Turkey is below Serbia with percentages between 86% in crisis 2020 and falling to 65% in 2020, while Bosnia and Herzegovina is far below Serbia, and there is not enough data for Montenegro.

## CONCLUSION

The application of digital technologies is a critical factor in the success of a company's operations. In the turbulent and globalized market as it is today, only those companies that apply and adopt technological trends can count on survival and development. The crisis caused by Covid-19, which simply stopped the flow of people and goods, forced companies to digitize their business even more quickly. Only those companies that were ready to quickly reorient themselves to e-commerce and e-orders managed to survive on the market.

The application of digital technologies is particularly difficult in small and medium-sized enterprises due to insufficient resources, both financial and human. EUROSTAT data also show a big difference in the application of digital technologies in large and small and medium-sized enterprises. Data from 2020 show that 44% of large businesses had e-sales, 29% of medium and 20% of small businesses. Also, the share of turnover from e-sales is 27% in large companies, while that share is 15% in medium-sized companies and only 8% in small ones.

As the process of digitization is unstoppable and one of the key factors in the competitive circumstances on the market, which is primarily reflected in electronic sales and trade, this working paper made a comparative analysis of Serbia with the average of EU countries. In order to obtain more realistic data on the share of companies that had e-sales, then the percentage of turnover from e-commerce as well as the percentage of companies that had more sales through their own websites and applications, it was made comparative analysis of the relationship of Serbia with neighboring countries that are members of the EU as well as with countries of the Western Balkans.

The results show that in Serbia, the percentage of companies that implemented e-commerce was the highest in 2019 and that it subsequently decreases, which is an interesting fact. Also, the result shows that it is above the EU average and that Croatia has better results than the surrounding countries, while Serbia has slightly better results than the countries of the Western Balkans. When it comes to the percentage of turnover from e-commerce, Serbia is far below the EU average as well as the EU member countries in which Hungary has the highest percentages in all four analyzed years, while in relation to the countries of the Western Balkans, Serbia is also slightly worse. The companies that had web sales through their own web or applications in Serbia are above the average of EU member countries and it is in the rank of EU member countries and with higher percentages compared to the countries of the Western Balkans.

## REFERENCES

- [1] W. T. Organization, «World Trade Report 2016», 2016.
- [2] Schwab, K. (2017) *The Fourth Industrial Revolution*. Crown Publishing Group, New York
- [3] Pergelova A., Manolova T., Ralitsa Simeonova-Ganeva & Desislava Yordanova (2019) Democratizing Entrepreneurship? Digital Technologies and the Internationalization of Female-Led SMEs, *Journal of Small Business Management* Pages 14-39 | Published online: 11 Nov 2019
- [4] Gurbaxani V., Dunkle, D. (2019), Gearing Up for Successful Digital Transformation, *MIS Quarterly Executive* September 2019 (18:3).
- [5] Cennamo, C., Santalo, J., 2019. Generativity tension and value creation in platform ecosystems. *Organ. Sci.* 30 (3), 617–641.
- [6] Liguori, E., Winkler, C., 2020. From offline to online: challenges and opportunities for entrepreneurship education following the Covid-19 pandemic. *Entrepreneurship Educ. Pedagog.* 3 (4), 346–351.
- [7] Giotopoulos, I., Kontolaimou, A., Korra, E., Tsakanikas, A., 2017. What drives ICT adoption by SMEs? Evidence from a large-scale survey in Greece. *J. Bus. Res.* 81, 60–69

- [8] Chatterjee, S., 2020. Internet of Things and social platforms: an empirical analysis from Indian consumer behavioural perspective. *Behav. Inform. Technol.* 39 (2), 133–149.
- [9] Kirchhoff, B., Walsh, S., 2000. Entrepreneurship's role in commercialization of disruptive technologies. In: Brauchlin, E., Pichler, J.H. (Eds.), *Unternehmer Und Unternehmensperspektive fur Klein-und Mittelunternehmen*. Dunker & Humboldt, Berlin/St. Gallen.
- [10] Kirchhoff, B., Walsh, S., 2008. Entrepreneurship's role in commercializing micro and nano technology products. In: Tolfree, D., Jackson, M.J. (Eds.), *Commercializing Micro-Nanotechnology Products*. CRC Press, Boca Raton, FL, USA.
- [11] Ayyagari, R., Grover, V., Purvis, R., 2011. Technostress: technological antecedents and implications. *MIS Q.* 35 (4), 831–858. Bagheri, A., Newman, A., Eva, N., 2020. Entrepreneurial leadership of CEOs and employees' innovative behavior in high-technology new ventures. *J. Small Bus. Manage.* <https://doi.org/10.1080/00472778.2020.1737094>. Manage, In Press <https://doi.org/>.
- [12] Chatterjee, S., Chaudhuri, R., Vrontis, D., Piccolo, R., 2021. Enterprise social network for knowledge sharing in MNCs: examining the role of knowledge contributors and knowledge seekers for cross-country collaboration. *J. Int. Manag.* 27 (1), 100827
- [13] Li, W., Liu, W.K., Belitski, M., Ghobadian, A., & O'Regan, N., 2016. e-Leadership through strategic alignment: an empirical study of small- and medium-sized enterprises in the digital age. *J. Inform. Technol.* 31 (2), 185–206.
- [14] Ruutu, S., Casey, T., Kotovirta, V., 2017. Development and competition of digital service platforms: a system dynamics approach. *Technol. Forecast. Soc. Change.* 117, 119–130.
- [15] Robinson, D.K., Lagnau, A., Boon, W.P., 2019. Innovation pathways in additive manufacturing: methods for tracing emerging and branching paths from rapid prototyping to alternative applications. *Technol. Forecast. Soc. Change.* 146, 733–750.
- [16] Islam, N., Marinakis, Y., Majadillas, M.A., Fink, M., Walsh, S.T., 2020. Here there be dragons, a pre-roadmap construct for IoT service infrastructure. *Technol. Forecast. Soc. Change.* 155, 119073.
- [17] Kimani, D., Adams, K., Attah-Boakye, R., Ullah, S., Frecknall-Hughes, J., Kim, J., 2020. Blockchain, business and the fourth industrial revolution: whence, whither, wherefore and how? *Technol. Forecast. Soc. Change* 161, 120254.
- [18] Yoo, Y., Henfridsson, O., Lyytinen, K., 2010. Research commentary—The new organizing logic of digital innovation: an agenda for information systems research. *Inform. Syst. Res.* 21 (4), 724–735.
- [19] Kar, A.K., Mustafa, S.Z., 2019. Securing IoT devices in smart cities of India: from ethical and enterprise information system management perspective. *Enterp. Inf. Syst.* 15 (4), 585–615.
- [20] Jin, H., Hurd, F., 2018. Exploring the impact of digital platforms on SME internationalization: new Zealand SMEs use of the Alibaba platform for Chinese market entry. *J Asia-Pac, Bus* 19 (2), 72–95.
- [21] Chatterjee, S., 2019. Is data privacy a fundamental right in India? An analysis and recommendations from policy and legal perspective. *Int. J. Law Manag.* 61 (1), 170–190.
- [22] Piccolo, R., Chatterjee, S., Chaudhuri, R., Vrontis, D., 2021. Enterprise social network for knowledge sharing in MNCs: examining the role of knowledge contributors and knowledge seekers for cross-country collaboration. *J. Int. Manag.* 27 (1), 100827.
- [23] Courtney, C., Dutta, S., Li, Y., 2017. Resolving information asymmetry: signaling, endorsement, and crowdfunding success. *Entrepreneurship Theory Pract* 41 (2), 265–290. Crant, J.M., 1996. The proactive personality scale as a predictor of entrepreneurial intentions. *J. Small Bus. Manage.* 34 (3), 42–53.
- [24] Elia, G., Margherita, A., Passiante, G., 2020. Digital entrepreneurship ecosystem: how digital technologies and collective intelligence are reshaping the entrepreneurial process. *Technol. Forecast. Soc. Change.* 150, 119791.
- [25] Pereira, C.N. N. Durão, D. Fonseca, M. J. Ferreira, e F. Moreira, «An Educational Approach for Present and Future of Digital Transformation in Portuguese Organizations», *Appl. Sci.*, vol. 10, n. 3, p. 757, Jan. 2020, doi: 10.3390/app10030757.
- [26] Verhoef, P. C., Broekhuizen, T., Bart, Y., Bhattacharya, A., Dong, J. Q., Fabian, N., & Haenlein, M. (2019). Digital transformation: A multidisciplinary reflection and research agenda. *Journal of Business Research.* <https://doi.org/10.1016/j.jbusres.2019.09.022>.
- [27] Ding, D., C. Guan, C. M. L. Chan, e W. Liu, «Building stock market resilience through digital transformation: using Google trends to analyze the impact of COVID-19 pandemic», *Front. Bus. Res. China*, vol. 14, n. 1, p. 21, Dez. 2020, doi: 10.1186/s11782-020-00089-z.
- [28] Guo, H., Z. Yang, R. Huang, e A. Guo, «The digitalization and public crisis responses of small and medium enterprises: Implications from a COVID-19 survey», *Front. Bus. Res. China*, vol. 14, n. 1, pp. 1–25, 2020, doi: 10.1186/s11782-020-00087-1.
- [29] S. Gavrilava e A. de Lucas Ancillo, «Spanish SMEs' digitalization enablers: E-Receipt applications to the offline retail market», *Technol. Forecast. Soc. Change*, vol. 162, p. 120381, Jan. 2021, doi: 10.1016/j.techfore.2020.120381.

- [30] Okuda e A. Karazhanova, «Digital Resilience against COVID-19», United Nations ESCAP, 2020. <https://www.unescap.org/blog/digitalresilience-against-covid-19> (acedido Jan. 22, 2021).
- [31] Bharadwaj, A., El Sawy, O. A., Pavlou, P. A., & Venkatraman, N. (2013). Digital Business Strategy: Toward a Next Generation of Insights. Retrieved from MIS Quarterly, 37(2), 471–482 <http://www.jstor.org/stable/43825919>
- [32] von Briel, F., Davidsson, P., & Recker, J. (2018). Digital technologies as external enablers of new venture creation in the IT hardware sector. Entrepreneurship Theory and Practice, 42(1), 47–69. <https://doi.org/10.1177/1042258717732779>
- [33] Wintjes, J.P. «The development of a strategic omnichannel strategy for fashion retail brands: the case of Tommy Hilfiger / Jan Philipp Wintjes», Heriot-Watt University, 2019.
- [34] Bollweg, L., R. Lackes, M. Siepermann, e P. Weber, «Drivers and barriers of the digitalization of local owner operated retail outlets», J. Small Bus. Entrep., vol. 32, n. 2, pp. 173–201, Mar. 2020, doi: 10.1080/08276331.2019.1616256
- [35] Roy, R., Lampert, C. M., & Stoyneva, I. (2018). When dinosaurs fly: The role of firm capabilities in the ‘avianization’ of incumbents during disruptive technological change. Strategic Entrepreneurship Journal, 12(2), 261–284. <https://doi.org/10.1002/sej.1278>
- [36] Amit, R., & Han, X. (2017). Value creation through novel resource configurations in a digitally enabled world. Strategic Entrepreneurship Journal, 11(3), 228–242. <https://doi.org/10.1002/sej.1256>
- [37] Rietveld, J. (2018). Creating and capturing value from freemium business models: A demand-side perspective. Strategic Entrepreneurship Journal, 12(2), 171–193. <https://doi.org/10.1002/sej.1279>
- [38] Tortora, D., Chierici, R., Briamonte, M. F., & Tiscini, R. (2021). ‘I digitize so I exist’. Searching for critical capabilities affecting firms’ digital innovation. Journal of Business Research, 129, 193–204. <https://doi.org/10.1016/j.jbusres.2021.02.048>
- [39] Borangiu, T., Trentesaux, D., Thomas, A., Leitˆao, P., & Barata, J. (2019). Digital transformation of manufacturing through cloud services and resource virtualization. Computers in Industry, 108, 150–162. <https://doi.org/10.1016/j.compind.2019.01.006>
- [40] Ardito, L., Raby, S., Albino, V., & Bertoldi, B. (2021). The duality of digital and environmental orientations in the context of SMEs: Implications for innovation performance. Journal of Business Research, 123, 44–56. <https://doi.org/10.1016/j.jbusres.2020.09.022>
- [41] Bresciani, S., Huarng, K.-H., Malhotra, A., & Ferraris, A. (2021). Digital transformation as a springboard for product, process and business model innovation. Journal of Business Research, 128, 204–210. <https://doi.org/10.1016/j.jbusres.2021.02.003>
- [42] Coreynen, W., Matthyssens, P., & Van Bockhaven, W. (2017). Boosting servitization through digitization: Pathways and dynamic resource configurations for manufacturers. Industrial Marketing Management, 60, 42–53. <https://doi.org/10.1016/j.indmarman.2016.04.012>
- [43] Ritter, T., & Pedersen, C. L. (2020). Digitization capability and the digitalization of business models in business-to-business firms: Past, present, and future. Industrial Marketing Management, 86, 180–190. <https://doi.org/10.1016/j.indmarman.2019.11.019>
- [44] Berger, E. S. C., von Briel, F., Davidsson, P., & Kuckertz, A. (2021). Digital or not – The future of entrepreneurship and innovation: Introduction to the special issue. Journal of Business Research, 125, 436–442. <https://doi.org/10.1016/j.jbusres.2019.12.020>
- [45] Audretsch, D. B., & Belitski, M. (2021). Knowledge complexity and firm performance: Evidence from the European SMEs. Journal of Knowledge Management, 25(4), 693–713. <https://doi.org/10.1108/JKM-03-2020-0178>
- [46] Audretsch, D. B., Cunningham, J. A., Kuratko, D. F., Lehmann, E. E., & Menter, M. (2019). Entrepreneurial ecosystems: Economic, technological, and societal impacts. The Journal of Technology Transfer, 44(2), 313–325. <https://doi.org/10.1007/s10961-018-9690-4>
- [47] Roundy, P. T., Bradshaw, M., & Brockman, B. K. (2018). The emergence of entrepreneurial ecosystems: A complex adaptive systems approach. Journal of Business Research, 86, 1–10. <https://doi.org/10.1016/j.jbusres.2018.01.032>
- [48] Nambisan, S. (2017). Digital entrepreneurship: Toward a digital technology perspective of entrepreneurship. Entrepreneurship Theory and Practice, 41(6), 1029–1055. <https://doi.org/10.1111/etap.12254>
- [49] Boateng, R., Heeks, R., Molla, A., Hinson, R., 2008. E-Commerce and socio-economic development: conceptualizing the link. Internet Res. 18 (5), 562–594.
- [50] Ngai, E.W.T., Wat, F.K.T., 2002. A literature review and classification of electronic commerce research. Inf. Manage. 39, 415–429
- [51] Zwass, 1996 “Electronic commerce: structures and issues” International Journal of Electronic Commerce, 1 (1) (1996), pp. 3-23
- [52] Choi, S., Stahl, D., Whinston, A. 1997. The Economics of Electronic Commerce. Indianapolis : Macmillan Technical Publishing.

**Article history**

Received 18 January 2023

Accepted 1 December 2023

# HUMAN RESOURCE MANAGEMENT DIGITALIZATION

**KALAVAKOLANU Sripathi<sup>1</sup>, PRASAD kdv<sup>2</sup>**

<sup>1,2</sup>Symbiosis Institute of Business Management, Hyderabad Symbiosis International (Deemed University), Pune (INDIA)  
E-mails: k.sripathi@sibmhyd.edu; Kdv.prasad@sibmhyd.edu.in

## ABSTRACT

*This article will study the concept of digital transformation in the administration of human resources, as well as the ways in which different technologies are supporting various HR functions and the personnel who work for those activities. The study is of a descriptive character, and its compilation included the use of secondary data such as reports from corporations, web sources, blogs written by subject matter experts, and research papers. This study was conducted with the intention of investigating the concept of "SMACI," which refers to the utilization of Artificial Intelligence (AI), HR Chatbots, Machine Learning, and Robot process automation (RPA) in order to perform the fundamental responsibilities of human resource management (recruitment, screening, interviewing, and onboarding) in a manner that is more intelligently, more quickly, and more effectively. The study also made an intervention in the existing literature by analyzing the different strategies that are employed by companies for the growth and development of their human resources departments. This allowed the researchers to make a contribution to both bodies of knowledge. The benefits of implementing digital transformation in human resource management, the potential obstacles or challenges a company may face during transformation, and the solutions to overcome those obstacles have all been investigated, with the examples of Indian companies and their uniqueness in the business world serving as case studies.*

**Keywords:** Expert Systems, Management, Artificial Intelligence, Human Resource

**JEL:** O15

**DOI:** 10.5937/intrev2304160K

**UDC:** 005.96

**005.336.5:004.8**

**COBISS.SR-ID** 133925897

## INTRODUCTION

Artificial intelligence, robots, virtual reality, and device learning are all examples of technologies that have progressed to the point that they have the potential to completely take over whole communities, cultures, economies, and businesses. The Sphere is on the verge of undergoing its fourth industrial revolution at this very moment. According to research that was carried out by Deloitte, HR players are rising to the challenge of renovating not only the staff but also the manner work is carried out, in addition to renovating HR processes. This is a positive development. As a result, the digital transformation of human resources is not limited to HR alone; rather, it is a change that incorporates the whole business. The convergence of a number of technologies that, over the course of time, are making the distinction between the digital and the physical domains more difficult to discern is at the heart of this revolution. It includes everything from driverless cars to intelligent robots to artificial intelligence (AI), nanotechnology, and virtual reality once more for the digital environment, as well as the accompanying processes and goods. Not only has the proliferation of digital technology transformed the possibilities that are accessible to consumers, but it has also prompted a reevaluation of traditional ideas about the enhancement of products, the collective production of art, and the management of businesses. It is important to keep in mind that every HR revolution that has endured in the market, regardless of whether or not it is digital, has done so with a particular goal in mind, and this is a solid rule of thumb to follow. Companies often give the impression that they are caving into the worries of their workers, but it is never a good idea to digitalize key HR procedures just for the sake of using digital solutions. As a consequence, the firm in issue ends up implementing technology that is insufficient to meet its goals[1].

## LITERATURE REVIEW

Chapano et al.[2] investigated if digital HRM strategies are implemented across the HR value chain by South African organizations and whether they are effective at achieving business objectives. Motivation: This study demonstrates the adoption pattern of digital HRM strategies and their compatibility with business objectives. Quantitative cross-sectional research was employed. In the Eastern Cape Province of South Africa, 312 line managers and HRM experts in the automotive sector were polled. Purposive and snowball sampling were combined with exploratory factor analysis (EFA) and other statistical tests. The adoption of digital HRM strategies across the HR value chain was found to be moderate.

The COVID-19 epidemic caused most firms to adopt remote and hybrid working modes and accelerate HR digitization, according to Kuzior et al.[3]. Due to unusual conditions, this workplace digital revolution was unexpected. The writers investigated the new workplace. The study hypothesized that digitalizing work and HR procedures bring firms closer to sustainable development. Economic, environmental, and social balance is sustainability. Digital procedures and work styles affected CO2 emissions, plastic waste, energy savings, gender diversity, and inclusiveness. The authors used original and desk research to verify the hypothesis. A Berlin IT startup conducted the original investigation between March 2020 and August 2021. International startups and scale-ups were also surveyed. The authors found that digitalization can improve organizational sustainability.

Zavyalova et al. [4] used data from 449 small, medium, and big enterprises operating in the Russian market to try and shed light on the essential elements of HRM digitization examined against critical features of organizations. The gathered information demonstrated the presence of the qualitative and quantitative elements of digitalization. The study found that greater success and functionality have not necessarily accompanied a company's broad reach and high efficiency.

In their study, Zhou et al. [5] drew on the adaptive structuration theory (AST) and embeddedness theory to examine how HRM digitalization and system maturity interact with company performance, as well as the moderating effects of HR strategy and business participation. Findings suggested that the interaction between HRM digitalization and HRM system maturity is positively connected to firm performance based on a sample of 211 listed firms in China. The study discovered that digitalizing HRM could significantly improve business performance. The impact of HRM digitization will be greater when HR departments are actively involved in the strategic management of the company. HR departments will have a greater positive impact on corporate operations when they are actively involved in them.

Melnychenko et al. [6] researched and formulated ways of digitalizing the enterprise's HR management system in the context of globalization developments using HR technologies and HR-functions transformation analysis. The research focuses on HR technology modification, which affects HR function development in digital times. Research methods are a set of theoretical, methodological, economic, and applied issues of defining, developing, and implementing the enterprise's HR management system's digitalization in the context of globalization. It analyzed research articles on digitalization processes, digital goods, and HR solutions, HR-management digitalization process directions, and globalization's impact on the enterprise's HR-management system. The article explains digital technology's role in HR and the opportunities it presents. The impact of digitization on HR activities and HR procedures was examined. Digital workforce, workplace, and HR are the primary HR-management digitalization trends. Digitalization has proven its HR-management benefits. Due to fast-moving digital decisions and native countries' globalization and digitalization influence, HR-technologies development demands further research.

In order to determine the causes of the discrepancy between the actually achieved level and the planned level of digitalization of HR management and to support management decisions about the introduction of digital technologies, Gaponenko et al. [7] created a methodology. The methodology entails a diagnosis of the degree of HR management digitization in three areas: digital workplace, digital management system, and digital workplace competency. For the diagnosis of staff digital skills, a combination method that combines self-diagnosis and manager evaluation on a single scale, then compares the results, has been presented. For estimating a digital workspace and a digital control system, a coefficient method is suggested. The benchmarking method is used to determine how much an organization's HR management has been digitalized.

Rudakova et al. [8] examined the evolution of HR functions under digitalization, and assessed the extent of automation of human resources administration activities, identifying the key opportunities for HR. Digital HR management requires mobile apps, social networks, analytics, cloud technology, VR, and new business development strategies. Everyone must first acquire the skills necessary to work effectively as a part of a team in order to facilitate a speedy shift to digital thinking for both management and employees. Implementing an integrated cloud platform that serves as the digital foundation for the company would be an excellent step to take in order to modernize the HR system. Research and adapt long-term plans to technology and evolutionary realities. HR must prioritize innovation. A team that understands all HR procedures and duties and can monitor, analyze, and use new stack technologies that arrive regularly is essential.

Fedorova et al. [9] analyzed different studies on the impact of digital technology introduction into personnel work in Russian enterprises of various industries and ownership types. Primary and secondary data were obtained. Surveys and interviews with respondents provided empirical data. The study's purpose determined the sample. Respondents were students, employees, and retirees. Summarizing and evaluating the research data, the authors illustrated how Russian companies are digitalizing human resource management. The article presents studies on HR-brand company development, sales manager recruiting, and employee labor function computerization. The authors concentrated on how digital technologies influence people's labor market and workplace behavior, such as work content, motivation, and efficiency.

Fedorova et al. [10] evaluated the impact that labor activity digitization procedures have on employee well-being, which is a topic that has gotten very little attention in HRM research and practice. The research investigates the causal relationship between employee well-being and the digital transformation of HRM practices. The research method used includes narrative and content analysis, as well as data analysis from sociological questionnaires. Furthermore, by utilizing the largest Russian institution as an example, the case study approach allows us to comprehensively investigate the issue. The findings of the study indicated the challenges that develop when digital technologies are more frequently employed in HRM systems, indicating both the good and negative effects that these procedures have on employee well-being. As a result, workplace wellness management techniques must be devised.

## OBJECTIVE

The research aimed to fulfill the following objectives:

- Human resources digitalization
- Improvements in human resource management thanks to digital innovation
- Problems faced by human resources in the age of digital transformation
- The upsides of hr.'s digital makeover

## METHODOLOGY

At this moment, the effects of the digital revolution are still being felt inside the department of human resources. To put this in more understandable words, the digital technology that was used to carry out the responsibilities that were delegated to this department resulted in those responsibilities undergoing significant shifts as a direct consequence of those shifts. This shift occurred as a direct consequence of the operations being delegated to the aforementioned department in the first place. Because of this, the company is able to save both time and money, which are two resources that are very significant to the operation of a firm. The information that you want is given down below for your convenience. The fundamental objective of this endeavor is to discover fresh and original approaches to incorporating digital tools and technology into the human resources department. Modifications may be made to every aspect of the operation, and it is strongly advised that these adjustments be made whenever feasible. This includes each and every step of the candidate selection and selection process. It's possible that incorporating certain elements of automation into the workflow of your company's human resources department can allow you to boost overall productivity at your organization. When this takes place, you are in a position to make better choices about recruiting and to better manage your team, both of which ultimately help your organization flourishing and thrive in a people-centered way over the long run.

## HUMAN RESOURCES DIGITALIZATION

As HR advances toward digital transformation and the future is determined by mobile, artificial intelligence, social media, and cloud computing, the capacity for organizations to train their employees to become more flexible, active, and modified is crucial. The acronym SMACI alludes to the interweaving of five different technologies: the internet, mobile devices, analytics, and social media platforms. Because of this comprehensive digital measurement framework, it is now possible to give the green light to initiatives that span product or service development, customer service, company operations, and human resource management. Customers have access to knowledge, commerce, and cooperation anytime and wherever they choose as a result of the synergistic benefits of the multiple components that make up SMACI.[11]

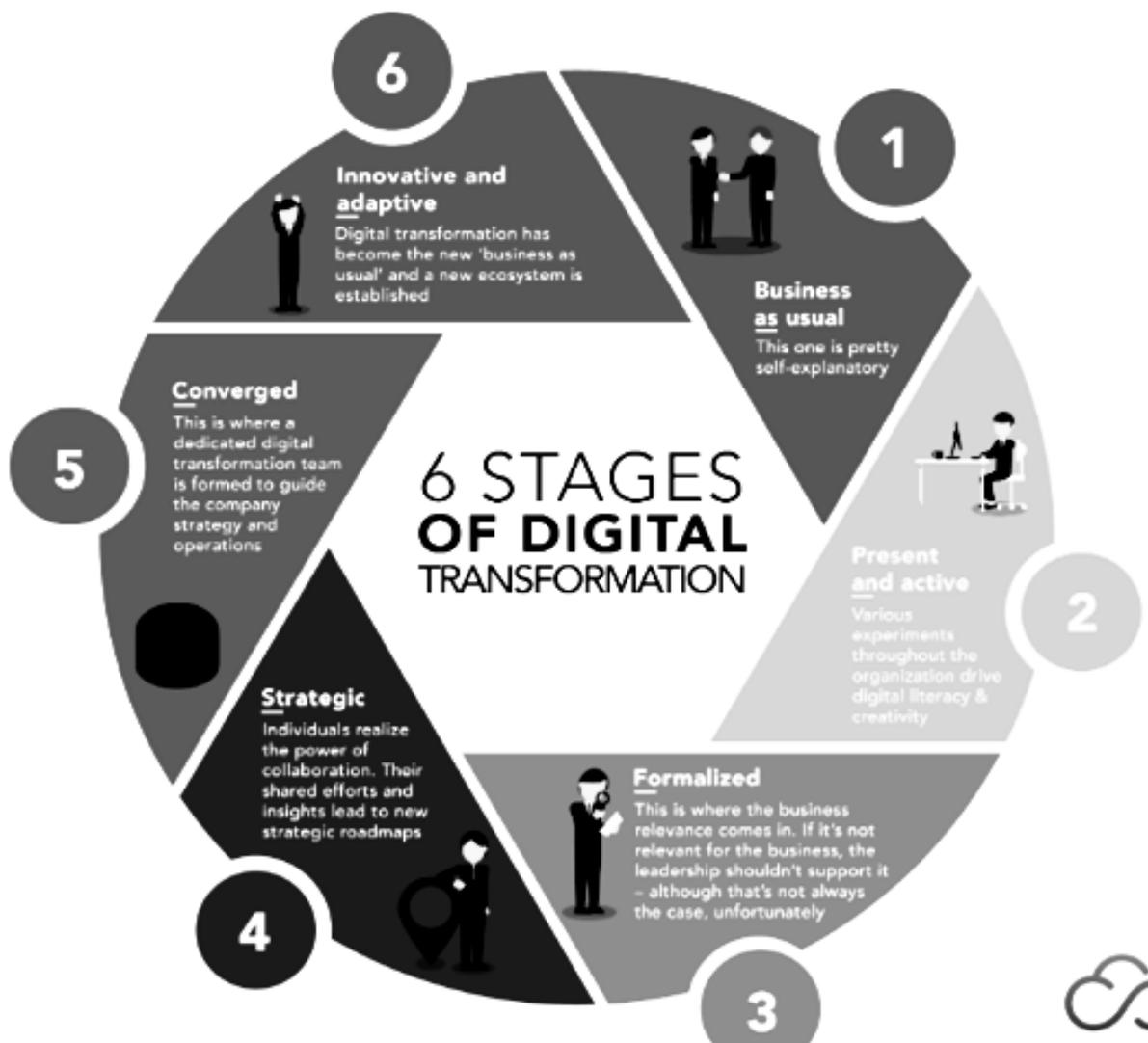
The use and utilization of technology inside the Human Resources department with the intention of improving that department's efficiency is what is meant by the phrase "HR digital transformation." Automate the digital transformation of human resources to save time and money, and simultaneously gather and analyze data from those cycles so that choices can be made with a greater level of awareness and understanding.

HR digital transformation is possible:

- A candidate worldwide positioning framework (ATS) may automatically screen through terrible up-and-comers using catchphrases and information from your high-performing reps rather than having to manually pursue every resume from job seekers who apply to your company.
- Onboarding software automates and streamlines the process of guiding new employees through a large volume of paperwork.
- Progression-arranging frameworks may combine data on worker performance, individual career goals, and authoritative skills to provide organizations with more evidence to guide advancement decisions than can be obtained via impulsive promotions.

### ***Improvements in Human Resource Management Thanks to Digital Innovation***

- Intelligent Employment Practices: The study found that roughly forty percent of companies are now using AI in their HR departments. The most successful organizations in the world, such as IBM, SAP, Facebook, and Hilton, are already putting this game-changing information to use in their recruitment processes in order to find great individuals, attract them to their companies, and ultimately employ them.
- Simplify screening and interviews: AI is proven effective in interviewing candidates by assessing their replies to standard questions and studying their body language. This helps to simplify the screening process. An AI can analyze a candidate's video interview in only 15 minutes and extract over 20,000 data points regarding the candidate's facial movements, originality, and word choice. This process takes just 15 minutes. Using machine learning may also help collect information on the communication styles of the candidates and evaluate whether or not they are a good cultural fit for the firm. Similarly, it may assist in determining whether or not the company is a good cultural match for the applicant. [12].
- It has been shown in the study that the onboarding process has a long-lasting influence on staff retention; thus, it should be strengthened. Because of this, it is very important to make a positive initial impression. AI is helping HR create a strong and positive first impression by reinventing the whole employee entry process via the production of maps. This process begins with the pre-hiring assessment and continues all the way through the interview stage, the Onboarding phase, and beyond.
- The use of technology allows for the prediction of whether or not an employee would condone an instance of bribery, corruption, or any other kind of probable unethical behavior. Using techniques such as Big Data and In-memory technology, businesses are now able to swiftly filter through massive amounts of unstructured data (such as emails, messages, scanned invoices, and so on) in search of indications of illegal or inefficient activity. A gadget of this kind is already being used by the accounting firm Ernst & Young.
- Robotics, an intelligent AI-machine learning technology, may be able to learn via observation how a human worker completes a repetitive action, leading to increased levels of productivity. Robots excel at automating labor-intensive jobs that include a lot of data. Robots are used for a wide variety of tasks, including data gathering from XLS files or systems, report production, data copying, data verification for completeness, email reading, processing, and approval, and data taping in HR or Payroll systems.
- Encourage continued learning in the workplace. Cloud-based productivity tools like Microsoft 365 may make it easier for employees to work and communicate at their highest levels without adversely affecting the amount of time available to do so. The HR department is able to construct individualized learning and development programs for each employee by making use of AI technology. This has a number of advantageous impacts, including greater productivity and job satisfaction, less stress at work, and reduced employee turnover.
- Assists Businesses in Preserving Their Edge in the Market: The integration of technological advancement into plans that are both realistic and sustainable is no longer a choice but a must. The use of good technology should be predicated on the idea that it should make your life easier in some way. No of the size of your business, you should develop a sound strategy for digital transformation and choose the technology that is most suited to fulfill your objectives.[13]



*Figure 1. Stages of Digitalization of Human Resource Management*

## **PROBLEMS FACED BY HUMAN RESOURCES IN THE AGE OF DIGITAL TRANSFORMATION**

Because workers are likely to disagree with any line of reasoning if they fear it may put their employment in jeopardy, the field of human resources is going to have a challenging future. The department that deals with human resources is already beginning to feel the impact of machines. The function of human resources (HR) will become much more important in the future to play the role of assuring employees of their talents and the resources required to apply those skills, all while automating the tasks that are superfluous to their occupations. In the future, HR will play the role of assuring employees of their talents and the resources required to apply those skills.[14] .

The following is a list of some of the potential difficulties that an organization can encounter:

1. **Resistance to change:** Technology is not the silver bullet that will miraculously free us from all of our problems; it can't cure any problem until we change the fundamental mindsets that underlie our thinking. People, in general, are not likely to inspire change unless and until they see it to be of significant importance.
2. **Support from the Leadership:** There should be a leader there to back and inspire the technology since the majority of businesses won't be able to practice digitalization because their managers or leaders were not encouraging enough. Therefore, having the backing of a decent leader who inspires revolution is something that is really necessary.

3. Sourcing the Right Talent, the collaboration of workers from different departments is one of the most important things that can be done to stimulate digital transformation. Don't allow the divide to do harm to the system, and in order to prevent this, make sure you have the proper technological advantage in the right location. This will help you bridge the gap between the developer and the communicator.
4. Having a Good Understanding of Your Customers: Businesses such as Amazon, Uber, Airbnb, and Tesla have fundamentally altered the future prospects of the market. The average customer today expects businesses to be able to identify their unique desires and requirements and devise individualized engagement strategies to meet those requirements. The vast majority of company executives are aware of this concept, yet they often become bogged down in conversations about modern technologies.

### *The upsides of HR's digital makeover*

Projects are expanding, and the need of translating promise into justification is compelling them to adopt HR digital transformation in order to provide development solutions. The benefits of HR digital transformation include creating the workforce of the future, guaranteeing a better representative experience, increasing accuracy in Dashboards and Analytics Data, managing the workforce, and increasing efficiency and agility to meet evolving business demands. [15]

- Mix and match your findings at every step

The Digital transformation framework is capable of properly managing data sources and criticism from customers and business associates.

- Form Adaptive Action Teams

By using sophisticated change in addition to business professionals and technology, we can ensure that decisions are taken after carefully examining our customers' needs rather than imposing them from on high. This benefits not just the company but also the customers.

- Third, use the executive's progress toward their desired changes as a metric of change success.

Adopting the new framework is crucial if continuous efforts are to be made to implement the best adjustments so that employees do not revert to practices that were ineffective before.

- Fourth, improve human resources productivity

Using Leave Board to request time off takes no more than 5 seconds. Those in charge of a group are automatically updated and given the chance to provide their stamp of approval. Try practicing your inner cycles and boosting your correspondence. Keep tabs on representative-training history to better predict future outcomes." [16].

- Spend less money and less time

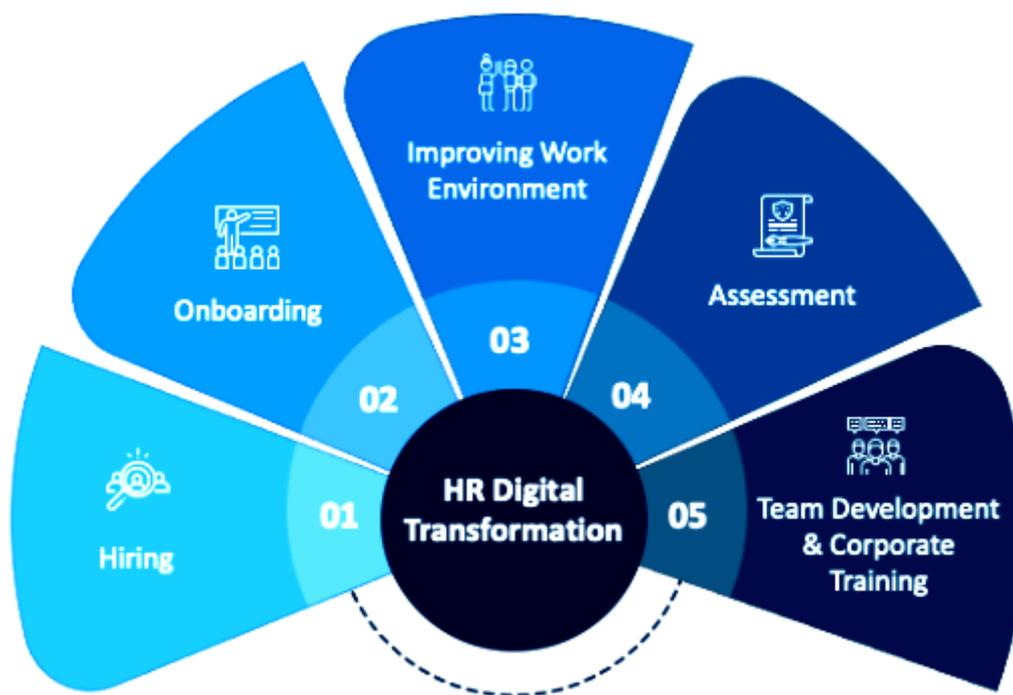
This is a great chance to reduce time spent on physical labor and stress caused by authoritative responsibilities. When relatives learn to maximize their time together, they are less likely to waste it on pointless activities and more likely to accomplish their goals. In a minute or two, I'll have the financial report ready for you. There are oblique savings to be had from using such systems, for instance, in the form of reduced time spent on quarterly reporting and carryforward administration.

- Improve the working conditions for your staff

Your family's skills, vitality, and productivity will all increase if you provide them access to training and education. In addition, your employees will be more loyal, focused, invested, and content in their work. They will be able to home in on the most critical tasks at hand and free up precious hours formerly spent on activities that generate a return on investment. The HR department may now create a unified representative experience to meet their evolving requirements thanks to cloud-based tools, big data, measure mechanization, clever combinations, and bots.

- Collect and store personnel information in one place

Find the illustrative data you need quickly and easily. Get rid of clutter and old paperwork. It is easier to provide the information you need at the time you need it when you use representative data sets. The use of data-driven strategies will become a standard differentiation factor across all industries. [17]



*Figure 2. Digitalization of Human Resources*

## CONCLUSION

Human resources digitalization is the use of cutting-edge technology to digitally alter long-standing HR procedures. The term "digital HR" refers to the automation of HR procedures and workflows via the use of cloud and SaaS technologies. Cloud is revolutionizing HR, reducing HR procedures, and enabling HR and People teams to concentrate on people. Organizations acquire cloud and SaaS technologies on a rolling subscription basis. With this digital strategy, businesses may avoid making a large upfront investment in physical infrastructure, instead spreading the expense out over time and adjusting it based on actual needs. By centralizing all of an organization's People data for analysis and reporting, digital HR empowers businesses to make informed, data-driven decisions. Businesses may take use of the cloud's potent analytic tools with a purpose-built, contemporary HRMS that is provided as SaaS. Management data and real-time inquiries allow HR & People teams to gauge progress, anticipate problems, and address them before they become major setbacks. With the help of HR technology, businesses can strategically plan their workforces and create exceptional employee experiences, putting them at the forefront of their industries by attracting and keeping top talent.

## REFERENCES

- [1] Nichols, A. (2022). Digital Nomads: A savvy enterprise's newest HR frontier. *Strategic HR Review*, 21(6), 185–190. <https://doi.org/10.1108/shr-08-2022-0049>
- [2] Chapano Munodani, Michelle R. Mey, & Amanda Werner. (2022). Adoption of digital strategies across the human resource value chain. *SA Journal of Human Resource Management*, 20(0), e1–e12. <https://doi.org/10.4102/sajhrm.v20i0.1992>
- [3] Kuzior, A., Kettler, K., & Raþ, L. (2022). Digitalization of Work and Human Resources Processes as a Way to Create a Sustainable and Ethical Organization. *Energies*, 15(1), 172. MDPI AG. Retrieved from <http://dx.doi.org/10.3390/en15010172>
- [4] Zavyalova, E., Sokolov, D., Kucherov, D., & Lisovskaya, A. (2022). The Digitalization of Human Resource Management: Present and Future. *Foresight & STI Governance*, 16(2), 42–51. <https://doi.org/10.17323/2500-2597.2022.2.42.51>

- [5] Zhou, Y., Liu, G., Chang, X., & Wang, L. (2021). The impact of HRM digitalization on firm performance: investigating three-way interactions. *Asia Pacific Journal of Human Resources*, 59(1), 20–43. <https://doi.org/10.1111/1744-7941.12258>
- [6] Melnychenko S., Lositska T., and Bieliaieva N. 2021. “Digitalization of the Hr-Management System of the Enterprise in the Context of Globalization Changes.” *Financial & Credit Activity: Problems of Theory & Practice* 6 (41): 534–43.
- [7] Gaponenko, T., Malkhasyan, A., Filin, N., & Bulatova, R. (2021). Diagnostics of the depth of digitalization of HR management. In *E3S Web of Conferences* (Vol. 273, p. 08086). EDP Sciences.
- [8] Rudakova Svetlana H., Danylevych Nataliia S., Shchetinina Liudmyla V., & Kasianenko Yaroslav A. (2020). Digital HR - the Future of Human Resources Administration. *Biznes Inform*, 1(504), 265–270. <https://doi.org/10.32983/2222-4459-2020-1-265-270>
- [9] Fedorova, A., Koropets, O., & Gatti, M. (2019, May). Digitalization of human resource management practices and its impact on employees’ well-being. In *Proceedings of the International Scientific Conference "Contemporary Issues in Business, Management and Economics Engineering"*, Vilnius (pp. 740-749).
- [10] Fedorova, A., Zarubina, A., Pikulina, Y., Moskovskikh, A., Balandina, T., & Gafurova, T. (2019). Digitalization of the human resource management: Russian companies’ case. In *International Conference on Education, Social Sciences and Humanities* (Vol. 12271230).
- [11] Rimon, G. (2017). Six surprising truths about how Digital Transformation Will Change HR. *Strategic HR Review*, 16(2), 102–104. <https://doi.org/10.1108/shr-02-2017-0010>
- [12] Biglova, A. A. (2021). HR-digital: Digital Technologies in Personnel Management. *Economic Development Research Journal*, (11), 67–72. [https://doi.org/10.54092/25420208\\_2021\\_11\\_67](https://doi.org/10.54092/25420208_2021_11_67)
- [13] Englert, M. (2018). HR goes Digital & Sustainable – Exzellente hr-Kommunikation und der weg zu human relations. *Digitale Unternehmensführung*, 307–317. [https://doi.org/10.1007/978-3-658-23053-1\\_19](https://doi.org/10.1007/978-3-658-23053-1_19)
- [14] DiRomualdo, A., El-Khoury, D., & Girimonte, F. (2018). HR in the digital age: How digital technology will change HR’s organization structure, processes, and roles. *Strategic HR Review*, 17(5), 234–242. <https://doi.org/10.1108/shr-08-2018-0074>
- [15] El-Khoury, D. (2017). Digital Transformation and the world-class HR difference. *Strategic HR Review*, 16(2), 86–88. <https://doi.org/10.1108/shr-01-2017-0001>
- [16] Dorogovtseva, A., & Erygina, A. (2019). HR-digital trends. *Management of the Personnel and Intellectual Resources in Russia*, 8(5), 19–22. [https://doi.org/10.12737/article\\_5dc960ab94c068.61133850](https://doi.org/10.12737/article_5dc960ab94c068.61133850)
- [17] Weigert, M., Bruhn, H.-D., & Strenge, M. (2016). Digital Hr oder HR digital – die bedeutung der digitalisierung für HR. *HR-Exzellenz*, 323–337. [https://doi.org/10.1007/978-3-658-14725-9\\_20](https://doi.org/10.1007/978-3-658-14725-9_20)

**Article history:**

Received 30 November 2022

Accepted 1 December 2023

# DIGITAL CURRENCY AS A TOOL FOR REDUCING INFORMATION ASYMMETRY (START-UPS' FINANCING EXAMPLE)

**KORABLEVA Olga<sup>1</sup>, KALIMULLINA Olga<sup>2</sup>**

<sup>1</sup>*Saint-Petersburg University of Management Technologies and Economics, , St Petersburg (RUSSIA)*

<sup>2</sup>*The Bonch-Bruевич Saint-Petersburg State University of Telecommunications, S-Petersburg (RUSSIA)*

*E-mails: on.korableva@gmail.com; chemireva@mail.ru*

## ABSTRACT

*Support for technology startups is a strategically important issue of economic development. One of the most relevant areas is a fintech startup. In this regard, it is interesting to consider the possibilities of new digital tools in the context of startup financing processes. The paper considers the problem of low efficiency of investing in startups, and makes an assumption about the possibilities of reducing the existing inefficiency of venture investments associated with information asymmetry through the usage of digital currency and digital platform.*

**Keywords:** *fintech startup, investment, digital currency, information asymmetry.*

**JEL:** L26

**DOI:** 10.5937/intrev2304169K

**UDC:** 336.7:004

005.51:005.334

**COBISS.SR-ID** 133928201

## INTRODUCTION

The use of innovations is one of the most important mechanisms for creating a sustainable competitive advantage and resilience in today's dynamic environment. Impressive achievements in the field of digital technologies contribute to the intensive growth of entrepreneurship and its manifestation in the form of startups. Digital innovations are widely used in all spheres of activity, including finance, and create new business models. This digital breakthrough has challenged the traditional way of providing financial services in more flexible, transparent and cost-effective ways. The fintech phenomenon comes from combining the English words finance and technology and refers to startups that use the latest technologies to provide innovative financial services. The fintech sector makes a significant contribution to the financial system by reducing costs, providing higher quality services and increasing customer satisfaction.

However, there are many uncertainties on the way to the development of technology startups [23] [25][2] [4] [5][6]: Due to the complexity of the solutions used and competitive environmental conditions, when studying the process of financing startups, we encounter the concept of information asymmetry. Distrust and uncertainty strongly affect the startup market.

The problem of information asymmetry in the used car market was raised in the 1970s by the Nobel Prize laureate G. A. Akerlof in his famous work "The Lemon Market: uncertainty of quality and the market mechanism" offered an understanding of why the used car market is characterized by mass distrust [1]. Solving the problem of information asymmetry between startups and investors is the key to successful fundraising for startups, which was considered in the research of Mollick, 2014; Ribeiro-Navarrete et al., 2021, Santoso et al., 2023. Sookram, 2023, Welter et al., 2023.

A startup is a developing technology company, the main problem of which throughout its development may be a lack of funding, since startups are also a "cat in the bag" with uncertain quality. This is due to the fact that, unlike more traditional business models, companies of this type operate in new markets, which is associated with a high risk of non-return on investment. Startups are forced to financially cover any technological developments and market entry until they are able to generate their own resources. Such companies do not find support in banks and are forced to look for other types of financing, both public and private. The startup market is characterized by high information asymmetry [3][20][31]. Startups always know more about a project than investors. To reduce information asymmetry, investors analyze a variety of information, project details, updates, and various market signals.

Within the framework of this study, an attempt is made to analyze the possibilities of new digital tools in the context of facilitating investment decisions in the process of financing startups. The article deals with the problem of inefficiency of venture investment in connection with the asymmetry of information. An assumption is made regarding the possibilities of reducing the existing inefficiency of venture investments associated with information asymmetry through the use of digital currency [37][36] and digital platform [38].

Research question 1. What is the state of the startup market in the Russian Federation?

Research question 2. How to reduce the information asymmetry in the financing of startups in the Russian Federation?

Research hypothesis: the use of digital currency and a specialized digital platform in financing startups can reduce information asymmetry and increase the effectiveness of financing.

## METHODOLOGY

Within the framework of this study, an analysis of the literature on startup financing, as well as on information asymmetry and digital currencies, an analysis of new digital tools based on blockchain technology was carried out. For this purpose, the search tools Elibrary, Google Scholar, and Scopus were used. The search strings included various combinations of the following terms: startups, startup financing, information asymmetry, digital currency.

The result of the search was a list of primary sources from 263 articles posted on the Internet, conference materials that either directly related to the concepts under study, or indirectly provided relevant information. If several articles covered similar or identical topics, articles were filtered: the journals with the highest rating were selected, had the largest number of citations and/or were written by authors with a solid track record of publications and reputation. This contributed to the ordering of the links used to the appropriate level for further analysis.

A consistent analysis of Statistical statistics on startups in Russia was also carried out, including characteristics of startups, industries, sources and amounts of funding to determine the problems and prospects of the Russian startup market.

## RESULTS

### ANALYSIS OF STARTUP FINANCING IN RUSSIA

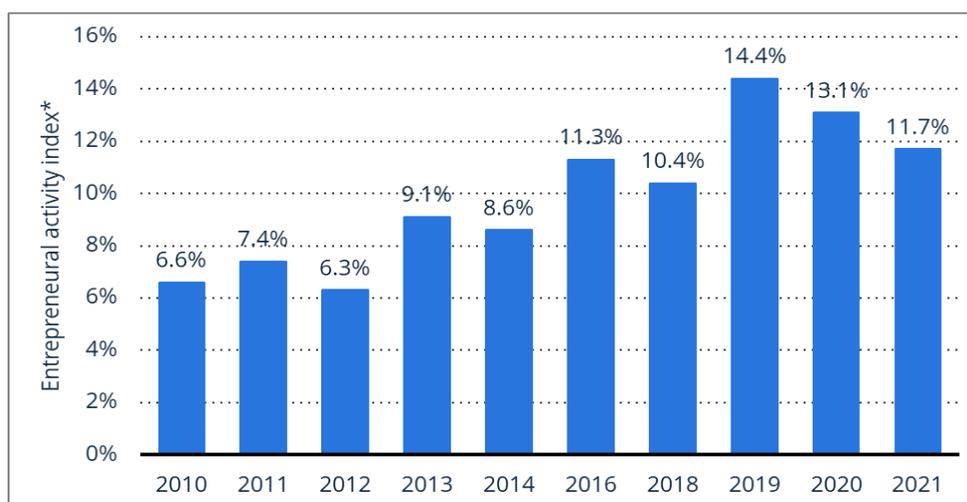
In 2022, more than 218 thousand new enterprises were created in Russia. In the period from 2017 to 2020, the number of new enterprises registered annually in the country gradually decreased. The number of new enterprises was lower than the number of closed enterprises, which in 2022 amounted to about 268 thousand. (fig. 1). This suggests the need to find new effective tools to support entrepreneurial activity to overcome this downturn.



**Fig. 1.** Number of new business registrations in Russia from 2017 to 2022 (in 1,000s)

Source: Number of new business registrations in Russia from 2017 to 2022. Data provided by the Federal State Statistics Service of Russia. <https://www.statista.com/statistics/1255142/russia-new-business-registrations/>

In 2021, less than 12 percent of Russians were engaged in entrepreneurial activity. In recent years, this indicator has decreased. For comparison, in 2019 it exceeded 14 percent. The index of entrepreneurial activity in Russia grew steadily from 2014 to 2019, but after 2019 it began to decline, which was associated with the pandemic (Figure 2).

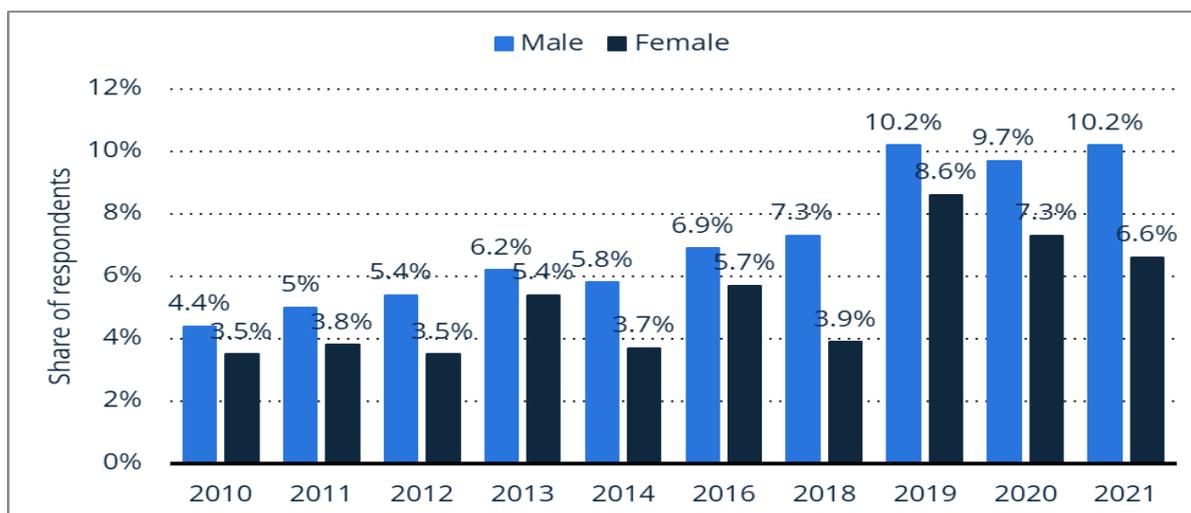


**Fig. 2.** Share of population engaged in entrepreneurial activity in Russia from 2010 to 2021

Source: Statista (2023).

The trend towards a decrease in entrepreneurial activity indicates a number of problems in this area: a high level of uncertainty in the market makes it necessary to reduce the level of risks, existing support tools do not work effectively enough.

Interestingly, in 2021, approximately 10 percent of Russian men aged 18 to 64 were aspiring entrepreneurs, compared to less than seven percent of women. The share of men engaged in early entrepreneurship prevailed over the share of women in all the observed periods (Fig. 3). This may be due to the difference in risk appetite between men and women. In conditions of information asymmetry and uncertainty, men are more prone to risk [22]. Reducing information asymmetry in venture financing processes can contribute to the gender alignment of the business community.



**Fig. 3.** Share of population engaged in early-stage entrepreneurial activity in Russia from 2010 to 2021, by gender

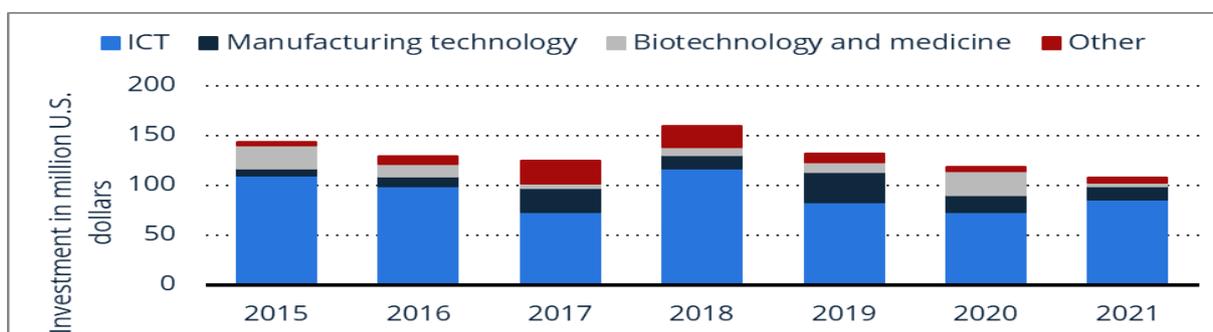
Note(s): Russia; from 2010 to 2021; at least 2000 respondents; 18-64 years

Source(s): GEM; Higher School of Management St. Petersburg; Sberbank of Russia

<https://www.statista.com/topics/7574/startups-in-russia/#topicOverview>

Analyzing the distribution of startups by industry, it can be noted that the cost of venture investments in projects in the field of information and communication technologies (ICT) in Russia was higher than in biotechnology and manufacturing technologies. All further data on financing will be given in US dollars, since the data of the service was used Statista.com.

In 2021, the total value of IT transactions was estimated at about 86 million US dollars, which is more than in the previous year (Fig. 4).



**Fig. 4.** Value of venture capital investment in Russia from 2015 to 2021, by sector (in million U.S. dollars)

Note(s): Russia; from 2015 to 2021

Source(s): Russian Venture Investment Association. Statista (2023).

The value of venture investments in information and communication technology (ICT) projects in Russia reached 86 million US dollars in 2021, compared with 73 million US dollars in the previous year.

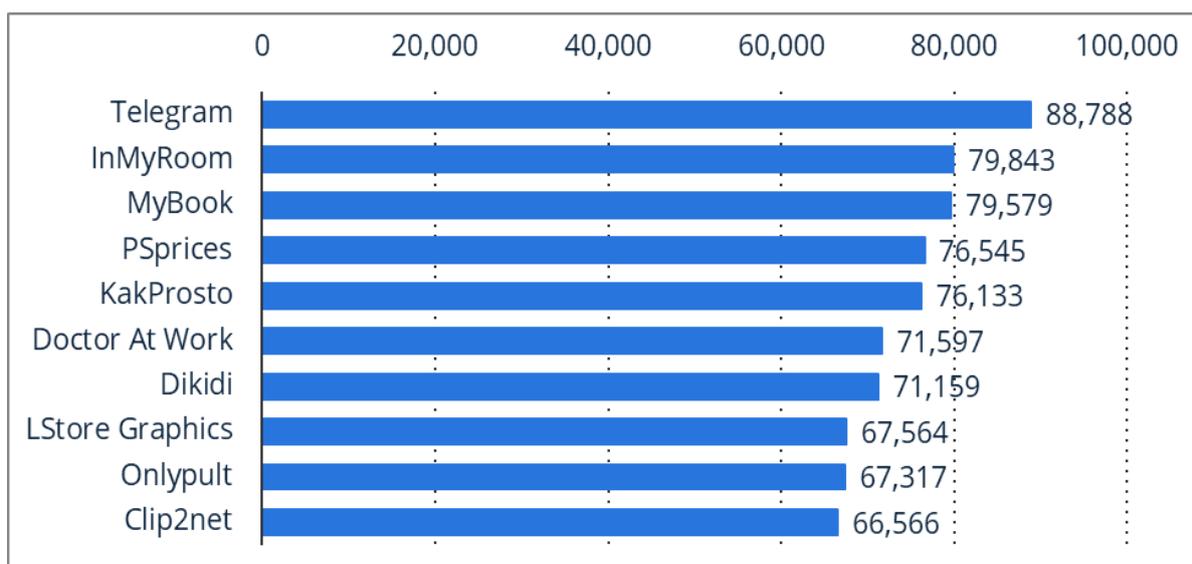
During the observed period, this figure peaked at 117 million US dollars in 2018. Venture investments in ICT had the highest cost compared to other sectors in the country (Figure 5).



**Fig. 5.** Value of venture capital investment in the information and communications technology (ICT) sector in Russia from 2015 to 2021 (in million U.S. dollars)

Source: Overview of the Russian Private Equity and Venture Capital Market. Statista (2023).

Analyzing the most successful startups, it can be noted that Telegram messenger has become the leading Russian startup with a score of almost 88.8 thousand points as of June 2022. It is followed by the interior design startup InMyRoom, whose rating was about 80 thousand points. The SR score measurements are based primarily on SEO and social media factors (Figure 6).

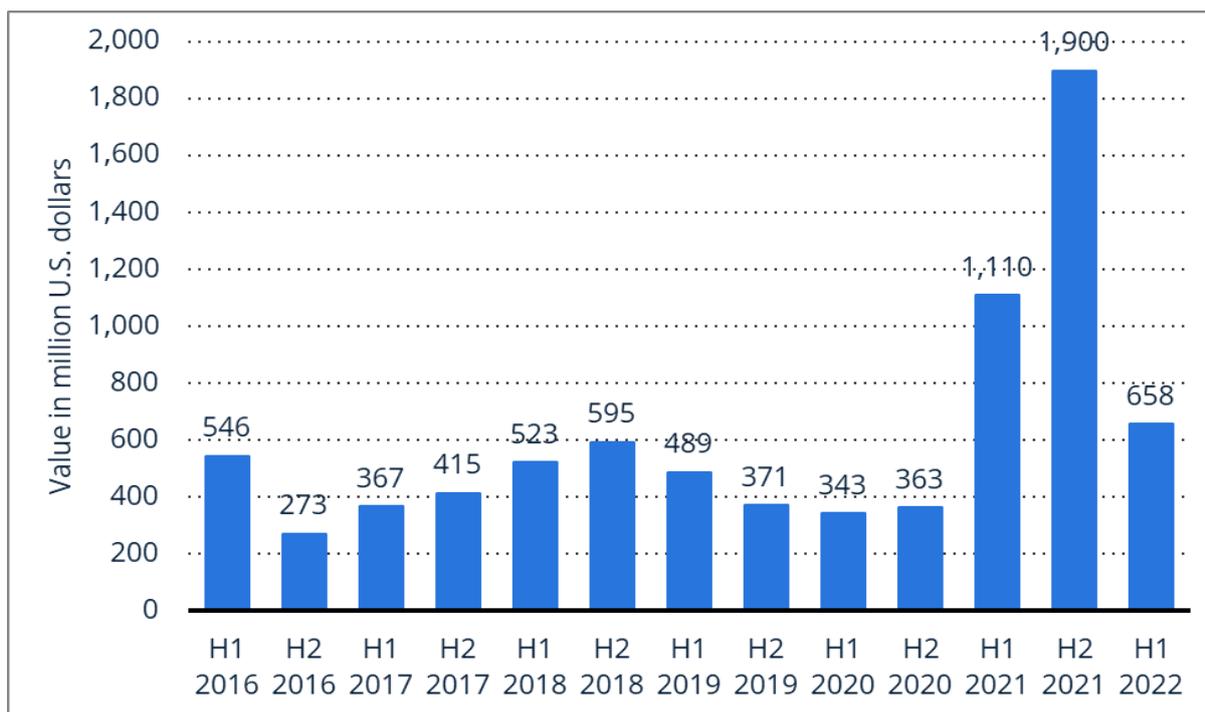


**Fig. 6.** Leading startups in Russia as of June 2022, by SR score

Note: Russia; from 2010 to 2021; at least 2000 respondents; 18-64 years

Source: Statista (2023).

The total volume of venture investments in Russian startups after the first half of 2022 amounted to 658 million US dollars, which is significantly lower compared to the corresponding period of the previous year. In the second half of 2021, the value of venture investments in the country amounted to almost two billion US dollars. (fig. 7.)

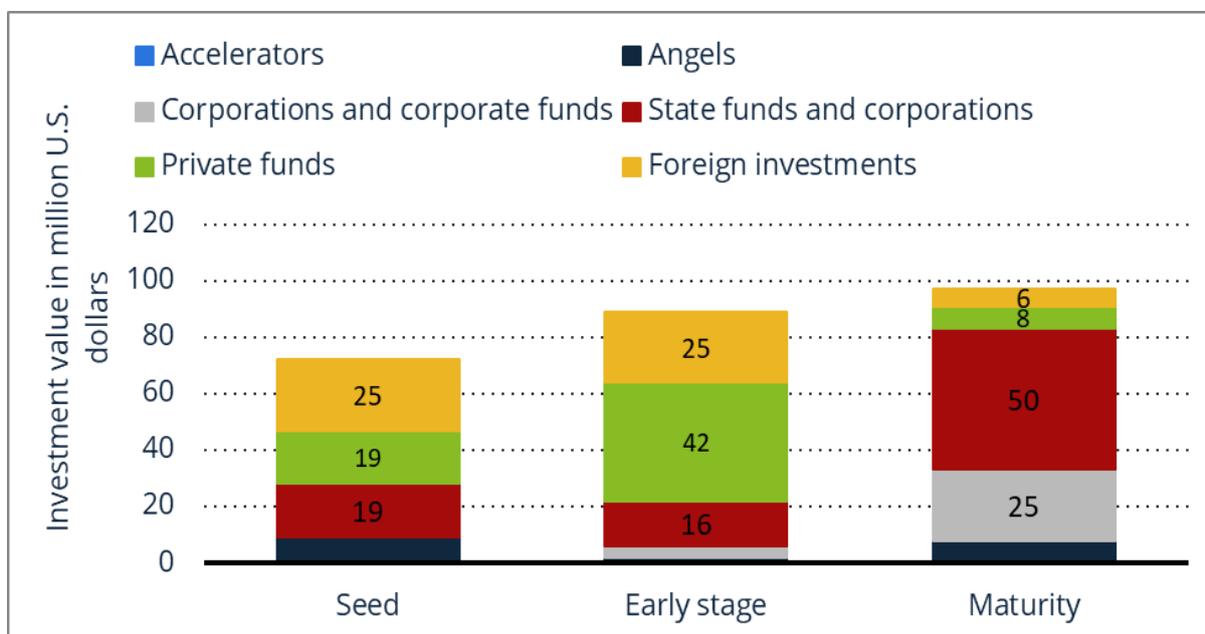


**Fig. 7.** Value of venture capital investment in startups in Russia from 1st half of 2016 to 1st half of 2022 (in million U.S. dollars)

Notes: Russia; from the 1st half of 2016 to the 1st half of 2022.

Sources: Statista (2023).

Let's analyze the sources of financing and at what stages of the project life cycle, which sources are more actively used (Figure 8).



**Fig. 8.** Venture capital investment in startups in Russia in 1st half 2022, by funding rounds stage and type of investor (in million U.S. dollars)

Notes: Russia; 1st half of 2022

Sources: Moscow Innovation Agency. Statista (2023).

Despite the fact that the volume of venture capital transactions was the largest at the initial stage, the cost of investments was the highest at the maturity stage for the specified period. Namely, startups at this stage of development collected about \$50 million from government funds and corporations in the

first half of 2022. At the seed stage, access to financing is difficult, financing from state funds and corporations is more actively involved at the maturity stage of the project. Startups received 25% of the volume of investments at the seed and early stages from foreign investors. At the moment, obtaining financing from foreign investors is difficult and 25% of the investment volume needs to be replaced with investments from other sources.

Based on a survey of more than 630 startup respondents in 2021 in the Russian Federation, the main sources of financing for startups at early stages were identified (Figure 9). As of 2021, about three-quarters of startups in Russia were funded by the equity of their founder at the launch stage. About eight percent of new companies received grants to start operations.

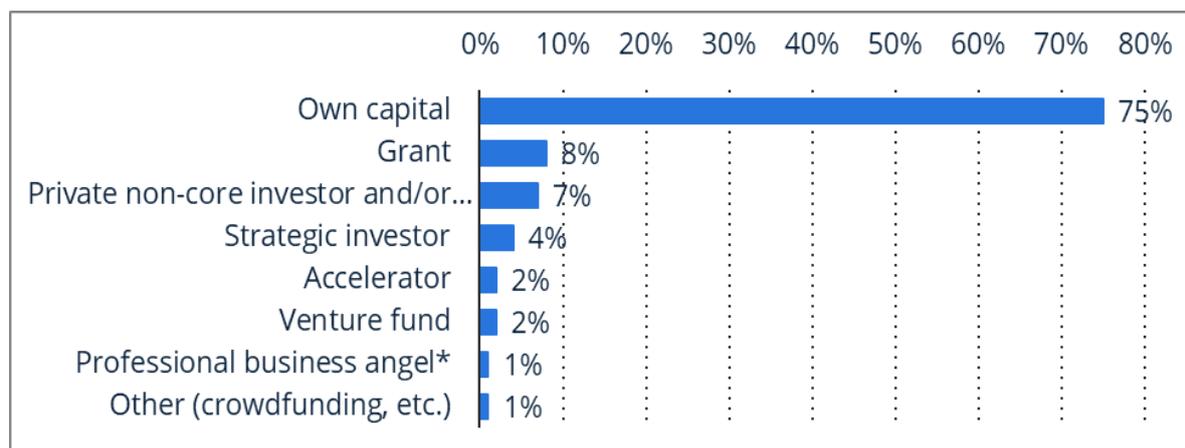


Fig. 9. Most common funding sources at the time of launching the startup in Russia in 2021

Notes: Russia; 2021; more than 630 respondents; Founders of startups in Russia; \* Private investor with more than 10 investments in the portfolio.

Source(s): Internet Initiatives Development Fund; Rostelecom PJSC; VK Barometer. Statista (2023).

Thus, there is an obvious need to expand the possibilities of venture financing. The process of obtaining financing continues to disappoint both venture capital firms and startups. Although uncertainty and risk are integral attributes of venture activity, there is inefficiency associated with information asymmetry in the process of venture investment. It is important to formulate this inefficiency both from the perspective of a startup and from the perspective of venture capital, and suggest some ways to reduce this inefficiency in order to achieve better results for startups, venture capitalists and society as a whole. The reduction of information asymmetry can contribute to the gender alignment of the business community, as well as increase the level of attracted financing at the seed stage of the project.

## THE PROBLEM OF INFORMATION ASYMMETRY IN VENTURE FINANCING

An imperfect competitive financial market has several fundamental problems, such as unfavorable selection and the problem of information asymmetry, which is especially relevant in the case of an investment transaction with venture capital [10][11]. The evaluation of a startup idea is based on information received from a variety of stakeholders, such as markets, governments, business owners and research and development activities. Information asymmetry may exist due to information privately held by external stakeholders and/or information that is not easy to track. Eliminating/minimizing information asymmetry can help investors make informed decisions about venture investment, increasing business efficiency in the long term.

Reducing information asymmetry in the process of choosing a project for investment clearly benefits startups and venture capital companies, but these benefits extend to broader aspects. The result has a great impact on society as a whole [18]. Entrepreneurship stimulates job growth, innovation and economic development. Therefore, a more effective fundraising process is in the interests of startups, venture capital companies, as well as the communities and countries in which they operate. Firstly, reducing the time and costs associated with the financing process will lead to investors financing more businesses. Less capital wasted on incorrect investment decisions caused by information asymmetry

frees up this capital for more suitable investments. Secondly, the reduction of information asymmetry will reduce search costs and free up startups to work on their project, and not to find funding. Moreover, investors spend most of their time evaluating startups [19][14], and not to increase the value of startups, accelerate the commercialization of products, which brings real benefits. Thirdly, the venture capital model is based on the assumption that a significant amount of venture capital investments in the early stages falls to zero value [34] Improving the process of information interaction between a venture investor and a startup will reduce information asymmetry and reduce transaction costs for information retrieval. It can also increase the effectiveness of agency relationships when the principal instructs the agent to invest in promising startups in the interests of the principal [15][16].

Let's consider the problems arising in connection with the current procedures of venture financing. Despite the general coordination of the goals of various stakeholders (i.e. startups, venture companies, society), there is inefficiency in the system, primarily due to information asymmetry. Various factors influence information asymmetry for both founders and venture capitalists. Information asymmetry can limit management's ability to make informed decisions. Despite the fact that information asymmetry is a multidimensional construct, the previous literature focused only on the asymmetry of financial information when making such decisions. In this regard, it is interesting to study the data of the World Bank Group from 1,250 observations in 11 emerging markets and interviews with eight owners and managers of small and medium-sized businesses [21]. The results of the study indicate that the asymmetry of financial information, business regulation and judicial information hinders effective decision-making on venture financing [17].

## **THE CENTRAL BANK'S DIGITAL CURRENCY AND DIGITAL PLATFORM AS A TOOL TO REDUCE INFORMATION ASYMMETRY IN VENTURE FINANCING**

Banking regulation addresses several issues: information asymmetry; bank failures; depositors' ability to recover their funds; unfair, discriminatory or fraudulent practices; and systemic risk. The financial system is one of the key elements of the functioning of the economy. State influence has always occupied and continues to play a serious role here. Amid the growing number of initiatives to issue private currencies, alternative systems for exchanging value (for example, using cryptocurrencies) and other challenges, central banks in most countries are beginning to explore the possibilities of digital transformation of one of the oldest elements of the economy — money. Digital currencies of central banks are one of the most important trends of the late 2010s, which can radically change the role of financial regulators in the financial services industry [12]. By the end of 2020, central banks around the world began to massively announce their interest in the development of the Central Securities Market, and from point initiatives of individual countries, digital currencies have become a general trend in the development of the industry [13].

The digital ruble (CR) is the third form of the national currency, which will be used on a par with cash and non-cash rubles [8].

The digital ruble is a digital form of the Russian national currency that the Bank of Russia plans to issue in addition to existing forms of money [8].

The digital ruble will have a number of unique properties and differences from fiat money. To finance startups, it is recommended to use a specialized platform based on blockchain technology, which will work with the digital ruble. As part of the study, the potential properties of the digital ruble were analyzed and an evaluation matrix was compiled (Table 1).

**Table 1. Digital Ruble valuation matrix**

	<b>STRENGTHS</b>	<b>WEAKNESSES</b>	<b>OPPORTUNITIES</b>	<b>THREATS</b>
Finance	<p>Increased competition within the financial system</p> <p>Increasing the stability of the financial system due to the possibility of improving monetary policy, as well as reducing the likelihood of panic cash withdrawals. This is of particular importance for anticipating crisis periods: by observing the flow of funds into its digital currency in real time, the Central Bank can make a conclusion about the financial condition of banks, as well as about the mood in society and respond more effectively to events and shocking (Carapella and Flemming, 2020) Opportunities to reduce information asymmetry for participants of the financial system</p>	<p>A radically innovative solution has more unexplored consequences for the existing financial services industry, which require a more careful approach and analysis, especially at the first stages of project development.</p>	<p>Improving national security in relation to financial services.</p> <p>Involvement in the creation of an international digital currency settlement system.</p> <p>Increase in GDP by reducing “distorting” taxes and other market imperfections.</p> <p>Increasing the average check, largely due to all the advantages of using financial innovations and non-cash payment methods for customers (Van Hove, 2021).</p> <p>Reducing the share of the shadow economy.</p>	<p>The design of the digital ruble implies the likelihood of an outflow of funds from the current financial services industry.</p>
Clients	<p>Providing products for target groups</p> <p>Creating products that do not have direct commercial benefits for existing financial intermediaries, while having tangible benefits for the end user</p> <p>Increasing mutual trust of participants in the financial system by reducing information asymmetry.</p>	<p>Offering a Digital Ruble to a target audience that is satisfied with current solutions may be a suboptimal waste of resources</p> <p>Heterogeneity of participants and the presence of vulnerable groups that have a low level of digital and financial literacy, low income, or, if we are talking about enterprises and financial intermediaries, with low business margins.</p>	<p>Increasing consumer welfare by increasing financial accessibility and minimizing risks (e.g. cash theft).</p> <p>Financial inclusion opportunities.</p>	<p>A low level of financial literacy among people can negatively affect the desire to try new things, as well as the understanding of the tool, the perception of its safety and necessity.</p>
Internal business processes	<p>If the role of distributed registries is strengthened, and the platform is based on the principles of organization unique to the market, it is possible to switch to a radical transformation of the current financial infrastructure, including industry platforms, for example, for financing startups.</p>	<p>The level of innovation of the Central Bank in relation to the current financial services industry</p>	<p>Changing the current business models of financial intermediaries affects not only the unique value proposition, but also the forms of monetization, the internal organization of intermediaries and other aspects of value creation.</p>	<p>The direct involvement of the Central Bank may undermine confidence in terms of performing the regulatory function.</p> <p>Compatibility with other industries.</p>

<p>Development</p>	<p>The technological reserve available, thanks to the initiatives of the Bank of Russia, can make it possible to create a Digital currency with minimal changes in the infrastructure.</p>	<p>Competition with commercial offers in those markets where existing financial services lead to a high level of well-being, and the market is saturated, can only stop the innovative development of the industry, putting unnecessary pressure on commercial players</p>	<p>Readiness of participants in the Russian financial services industry.  It is possible to involve partner solutions from other countries (e.g., together with the Chinese central bank or banks of the BRICS/CIS countries).</p>	<p>Due to the availability of a wide range of solutions from commercial market participants, Digital currency is likely to remain a niche product, especially if it is offered as a voluntary initiative for users.</p>
--------------------	--	--	--	---

The digital ruble can become a unique instrument of venture financing that can reduce information asymmetry, and if the role of distributed registries is strengthened and the digital ruble platform is based on organization principles unique to the market, a transition to a radical transformation of the current venture financing infrastructure is possible.

**CONCLUSION**

Research question 1. What is the state of the startup market in the Russian Federation?

As part of the study, it was revealed that the startup market of the Russian Federation is currently limited to the domestic market, as for financing, there are not enough effective tools at the startup launch stage (as of 2021, about three quarters of startups in Russia were funded from the equity of their founder), there are gender inequalities in the business community. It is necessary to increase the efficiency of financing and its volumes, to increase the competence to present their projects, it is necessary to develop a culture of supporting innovation with verified experience.

Research question 2. How to reduce the information asymmetry in the financing of startups in the Russian Federation?

Investment decisions are made based on several important factors. But often there is no information necessary for business management to make informed decisions. Information asymmetry in a transaction refers to an imbalance of information available to the parties involved, as a result of which one party has more information than the others. A lower level of information can increase the level of uncertainty that business management faces when carefully analyzing investment options. Consequently, enterprises with less information are likely to make suboptimal investment decisions, which can undermine the viability of their projects and, ultimately, the effectiveness of their business. Therefore, the key issue is to reduce the information asymmetry of the parties to the venture financing process.

However, new tools are emerging that can significantly reduce information asymmetry in venture financing. Thus, blockchain technology can reduce information asymmetry with the help of a system that stores data on the expenditure of funds as part of the implementation of a startup, such data is available if a digital currency is used to finance a startup. However, despite the fact that blockchain technology is strong in preserving information, understanding this information is still necessary to increase the value of the system for end users. The digital Ruble, the Central Bank's digital currency, is one of the promising tools based on blockchain technology. Ample opportunities to reduce information asymmetry for participants in the financial system will increase the level of mutual trust of participants. If the role of distributed registries is strengthened, and the digital ruble platform is based on organization principles unique to the market, it is possible to switch to a radical transformation of the current financial infrastructure, including industry platforms, for example, for financing startups.

The technological reserve available, thanks to the initiatives of the Bank of Russia, can allow the creation of a Central Bank with minimal changes in infrastructure.

Thus, the hypothesis of the study "the use of digital currency in financing startups can reduce information asymmetry and increase the effectiveness of financing" is confirmed.

Future research could focus on a more holistic understanding of the potential for digital currency to address information asymmetries. Also, one of the directions for future research is the design of a venture financing

platform based on blockchain technology with a multi-level verification process, the purpose of which is to assess the “quality” of the transaction flow on the platform. The first level algorithmically evaluates each trade using a variety of criteria that are combined to indicate its overall “quality.” The second level uses discrete deal flow channels. It is run by trusted organizations in the industry who use their experience and reputation to validate the deal. The third tier uses pre-approved agents on the platform to review and “qualify” specific deals. Ultimately, all organizations on the platform will have the same rating. Such a venture financing system could significantly reduce the level of information asymmetry and increase the efficiency of venture financing nationwide.

## ACKNOWLEDGMENTS

The research was carried out at the expense of a grant from the Russian Science Foundation № 23-28-00877, 2023-2024 <https://rscf.ru/en/project/23-28-00877/>.

## REFERENCES

- [1] Akerlof, G.A. (1970) The Market for ‘Lemons’: quality uncertainty and the market mechanism. *Q J Econ*, 84, 488–500. <https://www.jstor.org/stable/1879431>
- [2] Abakah, E. J. A., Wali Ullah, G. M., Adekoya, O. B., Osei Bonsu, C., & Abdullah, M. (2023). Blockchain market and eco-friendly financial assets: Dynamic price correlation, connectedness and spillovers with portfolio implications. *International Review of Economics and Finance*, 87, 218-243. doi: 10.1016/j.iref.2023.04.028
- [3] Adams M. (1994). Agency theory and the internal audit Manag. *Audit. J.*, 9, 8-12
- [4] Amit, R., Brander, J., & Zott, C. (1998). Why do venture capital firms exist? Theory and Canadian evidence. *Journal of Business Venturing*, 13, 441-466.
- [5] Alexander, C., Heck, D. F., & Kaeck, A. (2022). The role of binance in bitcoin volatility transmission. *Applied Mathematical Finance*, 29(1), 1-32. doi:10.1080/1350486X.2022.2125885
- [6] Barrett, B. (2019). Hack brief: Hackers stole \$40 million from Binance Crypto Exchange Wired. May 8. Retrieved from <https://www.wired.com/story/hack-binance-crypto-currency-exchange/>
- [7] Carapella F., & Flemming J. (2020). Central Bank Digital Currency: A Literature Review <https://www.federalreserve.gov/econres/notes/feds-notes/central-bank-digital-currency-a-literature-review-20201109.html>
- [8] Concept of the digital ruble published by the Central Bank of the Russian Federation dated 04/08/2021
- [9] <https://cbr.ru/fintech/dr/>
- [10] Connelly, B.L., Certo, S.T., Ireland, R.D. and Reutzel, C.R. (2011), “Signaling theory: a review and assessment”. *Journal of Management*, 37(1), 39-67.
- [11] Cumming, D., & Binti J. (2008). Preplanned exit strategies in venture capital. *European Economic Review*, 52(7), 1209–1241.
- [12] Skolkovo (2022). Digital currencies of central banks: typology, design and Russian specifics
- [13] <https://www.skolkovo.ru/researches/cifrovye-valyuty-centralnyh-bankov-tipologiya-dizajn-i-rossijskaya-spezifika/>
- [14] Drover, W., Busenitz, L., Matusik, S., Townsend, D., Anglin, A., & Dushnitsky, G. (2017). A review and road map of entrepreneurial equity financing research: Venture capital, corporate venture capital, angel investment, crowdfunding, and accelerators. *Journal of Management*, 43(6), 1820–1853.
- [15] Eisenhardt K. (1989). Agency theory: an assessment and review. *Acad. Manag. Rev.*, 14, 57-74
- [16] Fried, V.H., & Hisrich, R.D. (1994). Toward a Model of Venture Capital Investment Decision Making. *Financial Management*, 23, 28.
- [17] Glücksman S. (2020). THESIS FOR THE DEGREE OF LICENTIATE. A demand-side perspective on Venture Capital Financing. Department of Technology Management and Economic CHALMERS UNIVERSITY OF TECHNOLOGY, Gothenburg, Sweden 2020 [https://research.chalmers.se/publication/518321/file/518321\\_Fulltext.pdf](https://research.chalmers.se/publication/518321/file/518321_Fulltext.pdf)
- [18] Gompers, P. and Lerner, J. (2004). *The Venture Capital Cycle*. MIT press, Cambridge, MA.
- [19] Gompers, P., Gornall, W., Kaplan, S.N. and Strebulaev, I.A. (2020), “How do venture capitalists make decisions?”. *Journal of Financial Economics*, 135(1), 169-190.
- [20] Jensen, M. C. & Meckling, W. H., (1976). Theory of the firm: Managerial behavior, agency costs and ownership structure. *Journal of Financial Economics, Elsevier*, 3(4), 305-360, October.

- [21] Lin, M. S., Sharma, A., Pan, B., & Quadri-Felitti, D. (2023). Information asymmetry in the innovation adoption decision of tourism and hospitality SMEs in emerging markets: A mixed-method analysis. *Tourism Management*, 99 doi: 10.1016/j.tourman.2023.104793
- [22] Meleshkina A. I. (2017). The possibilities of gender policy to influence the perception of risk by economic agents. *Bulletin of the VSU. Series: Economics and Management*, 3, 177-183
- [23] Mirghaderi, S. A., Sheikh Aboumasoudi, A., & Amindoust, A. (2023). Developing an open innovation model in the startup ecosystem industries based on the attitude of organizational resilience and blue ocean strategy. *Computers and Industrial Engineering*, 181 doi: 10.1016/j.cie.2023.109301
- [24] Mollick E. (2014). The dynamics of crowdfunding: a study. *J. Bus. Ventur*, 29, 1-16. doi: 10.1016/j.jbusvent.2013.06.005
- [25] Page, A., & Holmström, J. (2023). Enablers and inhibitors of digital startup evolution: A multi-case study of Swedish business incubators. *Journal of Innovation and Entrepreneurship*, 12(1) doi:10.1186/s13731-023-00306-y
- [26] Ribeiro-Navarrete S., Palacios-Marquez D., Lassala K. and Ulrich K. (2021). Key information management factors to satisfy crowdfunding investors. *Int. J. Inf. Manag*, 59, 1-10. doi: 10.1016/j.ijinfomgt.2021.102354
- [27] Santoso, R.T.P.B., Priyanto, S.H., Junaedi, I.W.R. (2023). Project-based entrepreneurial learning (PBEL): a blended model for startup creations at higher education institutions. *J Innov Entrep* 12, 18.
- [28] Skolkovo Report (2023). [https://finance.skolkovo.ru/downloads/documents/FinChair/Research\\_Reports/SKOLKOVO\\_2018\\_10\\_ResearchReport\\_ru.pdf](https://finance.skolkovo.ru/downloads/documents/FinChair/Research_Reports/SKOLKOVO_2018_10_ResearchReport_ru.pdf)
- [29] Statista (2023). Startups in Russia - statistics & facts <https://www.statista.com/topics/7574/startups-in-russia/#topicOverview>
- [30] Sookram, P. C. (2023). Blockchain and crypto exchange-traded funds. The emerald handbook on cryptoassets: Investment opportunities and challenges (pp. 157-169) doi:10.1108/978-1-80455-320-620221011
- [31] Tata, F. (2023). Proposing an interval design feature to central bank digital currencies. *Research in International Business and Finance*, 64 doi: 10.1016/j.ribaf.2023.101898
- [32] The role of financial innovations in consumer behaviour in the Russian retail payments market: A comment on Krivosheya <https://ideas.repec.org/a/eee/tefoso/v172y2021ics0040162521004650.html>
- [33] Van Hove, Leo, (2021). The role of financial innovations in consumer behaviour in the Russian retail payments market: A comment on Krivosheya. *Technological Forecasting and Social Change*, Elsevier, vol. 172.
- [34] Venture Monitor (2023). PitchBook-NVCA, 2023 <https://pitchbook.com/news/reports/q1-2023-pitchbook-nvca-venture-monitor>
- [35] Welter, C., Holcomb, T. R., & McIlwraith, J. (2023). The inefficiencies of venture capital funding. *Journal of Business Venturing Insights*, 19 doi: 10.1016/j.jbvi.2023.e00392
- [36] Wandmacher, R. (2021). *Tokenization disrupts ETFs*. *Cryptofinance: A new currency for a new economy* (pp. 87-103) doi:10.1142/9789811239670\_0005
- [37] Waspada, I., Salim, D. F., & Krisnawati, A. (2023). Horizon of cryptocurrency before vs during COVID-19. *Investment Management and Financial Innovations*, 20(1), 14-25. doi:10.21511/imfi.20(1).2023.02
- [38] Yermack D. (2019). *Blockchain technology's potential in the financial system*. Proceedings of the 2019 Financial Market's Conference, May 20, Amelia Island, Florida

**Article history:**

Received 15 August 2023

Accepted 1 December 2023

# ANALYSIS OF THE EFFICIENCY OF BANKS IN SERBIA AND MONTENEGRO USING THE DEA METHOD

**SIMONOVIĆ Dragoljub<sup>1</sup>, MILOJEVIĆ Stefan<sup>2</sup>, MILAŠINOVIĆ Marko<sup>3</sup>,  
DIMITRIJEVIĆ Mladan<sup>4</sup>**

<sup>1</sup>University of Belgrade, Faculty of Organizational Science, Belgrade (SERBIA)

<sup>2</sup>EDUCONS University, Faculty of Business Economics, Sremska Kamenica (SERBIA)

<sup>3</sup>University of Kragujevac, Faculty of Hotel Management and Tourism, Vrnjačka Banja (SERBIA)

<sup>4</sup>Student Center Kragujevac, Kragujevac (SERBIA)

E-mail: d.simonovic@yahoo.com; aviation.adviser@gmail.com; marko.milasinovic@kg.ac.rs; office@studentskicentar-kg.rs

## ABSTRACT

*The banking sector of a country plays a crucial role in the overall economy of a nation. The efficiency of banks is a critical factor in assessing their financial performance and competitiveness. The aim of this paper is to measure the relative efficiency of the commercial banks in Serbia and Montenegro by using the non-parametric methodology Data Envelopment Analysis (DEA). The efficiency of banks will be measured using DEA for two models with different input and output variables. The sample consists of banks from Serbia (21) and banks from Montenegro (11) for the period 2017-2022. According to the obtained results, there are four banks that are relatively efficient every year, two from Serbia and two from Montenegro (AIK banka and 3M banka according to the first model and Crnogorska komercijalna banka and Hipotekarna banka according to the second model). The findings from the paper are valuable for further use by regulators, policy makers and bank management who are expected to identify a sustainable business strategy in line with the company's capabilities.*

**Keywords:** DEA analysis, business banks, efficiency, financial performance, business sustainability

**JEL:**G21

**DOI:** 10.5937/intrev2304181S

**UDC:** 005.332.1:336.71(497.11)"2017/2022"

005.332.1:336.71(497.16)"2017/2022"

**COBISS.SR-ID** 133929225

## INTRODUCTION

Financial institutions are a very important part of the financial system, and their quality has a dominant influence on the development of the economy [1], emphasizing that bank efficiency is a very important issue especially in transition economies [2]. According to Bou-Hamad et al. [3], the efficiency of banks has a critical role in the development of sound financial systems in countries. In modern business conditions, it is emphasized that well-functioning financial markets and banking institutions are usually considered to be a condition favorable to economic growth [4]. In its business, each banking institution has its own business principles, and one of the keys to a financially sustainable business is the principle of efficiency [5][6]. The ranking of banks is of vital importance if it is taken into account that the banking sector plays a significant role in the economic development of countries and business improvement [7], on the one hand, and that today's financial world is very complex compared to that of from one generation ago [8].

The paper is based on a systematic and comparative analysis of the available scientific literature, as well as on the results of the author's research. The research procedure was carried out based on the content analysis of primary and secondary sources. Revised and high-quality financial information is needed for business decision-making [9][10]. Data from publicly published financial reports for business banks operating in Serbia and those operating in Montenegro were used. The assessment of the efficiency of business banks was carried out using the DEA - CSR model. Data Envelopment Analysis (DEA): DEA is a non-parametric method that evaluates the relative efficiency of decision-making units (DMUs) based on multiple inputs and outputs. It aids in comparing similar entities by identifying efficient DMUs that achieve the highest level of outputs using the least amount of inputs.

The paper is organized in the following order. After the theoretical review in chapter 2, in chapter 3, the data used for the research and the applied methodology are presented. The rest of this paper will present the implementation of the CRS input-oriented DEA method, a non-parametric approach, i.e. model D2 (B) was used for business banks. Concluding considerations are given at the end of the paper.

## THEORETICAL BACKGROUND

Since DEA in its current form was first introduced in 1978, researchers in a number of fields quickly recognized it as an excellent and easy-to-use methodology for modeling business processes for performance evaluation [11]. Fukuyama et al. [12], state that traditional DEA-based models have been a vital tool case for the evaluation of banks' efficiency and productivity levels in different banking systems. As Lukić et al. [13] point out, due to the importance of the banking sector, its efficiency is being analyzed more and more. More and more attention is paid to the efficiency of financial institutions [14][15].

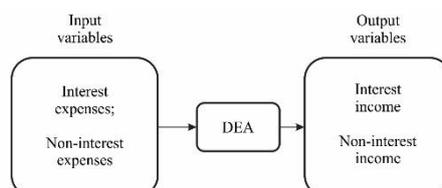
Data envelopment analysis (DEA) has become one of the most widely used instruments for measuring bank efficiency [16]. Four bank behaviour models which are most popularly employed to determine input and output factors in DEA studies - the intermediation approach, production approach, user cost approach and value-added approach [16].

## DATA AND METHODOLOGY

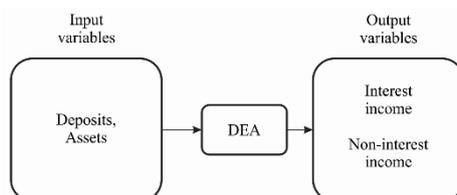
In this research, we use DEA to assess relative efficiency for 21 business banks in Serbia and 11 banks in Montenegro. For the application of the CRS model, two aspects were used, that is, two models (model A and model B). The purpose of the first model is to define how much interest and non-interest expenses should be reduced so that the bank can achieve the highest interest and non-interest income. On the other hand (model B), transactions based on non-fund income are observed. The first combination used variables according to Fotova Čikić et al. [17] (Figure 1), and the second combination used variables according to Tandon et al. [18], using an intermediate approach with a limited choice of variables (Figure 2).

The core profit efficiency model essentially seeks to evaluate how efficiently a bank transforms its input expenses (interest and non-interest expenses) into output incomes (net interest income and non-interest income) (model A). In other words, it assesses how well a bank manages its cost structure and revenue generation to maximize its profitability.

The choice of inputs and outputs for model B is guided by the previous choices of the mentioned studies and data availability. In addition to the above, the choice is also in line with recent trends in the Serbian banking industry. Namely, in addition to traditional activities such as borrowing and lending activities, banks are emphasizing transactions that generate more income without funds in order to encourage revenue growth. The trends in banking are different, but their impact on competitiveness is indisputable. Some of them are deregulation, technological progress and diversity of banking services [19], including the adoption of ESG products [20]. Over the past two decades, banking institutions have entered new product areas, moving from traditional lending to new strategies based on generating non-fund-based income through the provision of various services (securities trading, support for firms to issue new equity financing, securities commissions from values and asset management, etc.).



**Figure 1.** Parameters of the DEA - model A.  
Source: Authors



**Figure 2.** Parameters of the DEA - model B.  
Source: Authors

The DEA method is a specifically defined procedure for measuring the efficiency of complex units of a business system with different inputs and outputs [21]. DEA is one of the most widely recognized methods or approaches for calculating the relative efficiency of DMUs [22]. Decision Making Unit (DMU) is the standard name for business units (here business banks). DEA gives results about the DMU in terms of efficiency and inefficiency, as well as how much it is necessary to reduce a certain input and/or increase a certain output in order to make a certain DMU effective. The DEA model can be constructed either to minimize inputs or to maximize outputs [23].

The following form is used to apply DEA efficiency:

DEA Efficiency = Weighted sum of outputs / Weighted sum of inputs

The above definition of DEA Efficiency enables the aggregation of observed inputs and outputs into one virtual input and virtual output as a quotient of the sum of the product of weight coefficients and input values and the sum of the product of weight coefficients and output values.

The CRS models assume constant returns to scale (The Constant Returns to Scale Model). If the condition that is  $\sum_{j=1}^n \lambda_j = 1$  is added, then models are obtained, known as BCC DEA models [24] or VRS

(The Variable Returns to Scale Model) models, depending on the literature used. Basic DEA models have various variants in terms of certain restrictions, such as restrictions on weights or depending on the type of input or output, etc. In the following, two selected basic DEA models will be presented.

MODEL D1. Let  $x_{ij}$  – be the observed value of the input of the  $i$ -th row for  $DMU_j$  ( $x_{ij} > 0$ ,  $i = 1, 2, \dots, m$ ,  $j = 1, 2, \dots, n$ ), and  $y_{rj}$  – the observed value of the output of the  $r$ -th row for  $DMU_j$  ( $y_{rj} > 0$ ,  $r = 1, 2, \dots, s$ ,  $j = 1, 2, \dots, n$ ).

Charnes, Cooper & Rhodes proposed (known as the CCR ratio model) that for each  $DMU_k$ ,  $k = 1, 2, \dots, n$ , an optimization problem should be solved which is in the following form:

$$\max h_k(u, v) = \frac{\sum_{r=1}^s u_r y_{rk}}{\sum_{i=1}^m v_i x_{ik}},$$

with conditions

$$\sum_{r=1}^s u_r y_{rk} / \sum_{i=1}^m v_i x_{ik} \leq 1, u_r \geq 0, v_i \geq 0, r = 1, 2, \dots, s, j = 1, 2, \dots, m,$$

where

$h_k$  - relative efficiency of the  $k$ -th DMU,  $n$  - number of observed DMUs,  $m$  - number of inputs,  $s$  - number of outputs,  $u_r$  - weighting coefficient for output  $r$ ,  $v_i$  - weighting coefficient for input  $i$ . Weighting coefficients  $u_r$  and  $v_i$  represent the unknowns in the model that are determined by optimization, and are essential for the construction of the virtual input and the virtual output.

From the above it can be seen that  $0 \leq h_k \leq 1$ . First, if  $h_k$  is equal to 1 then the  $k$ -th DMU is relatively efficient, meaning that no other DMU can achieve a higher output value for a given input. The efficient  $k$ -th DMU has optimal values for the weighting coefficients. Second, if  $h_k$  is less than 1 then the  $k$ -th DMU is relatively inefficient and the value  $h_k$  indicates by what percentage the  $k$ -th unit should reduce its inputs. Third, it should be emphasized that the weighting coefficients  $u_r$  i  $v_i$  show the degree of importance of each input and output for each DMU so that each DMU is as efficient as possible. The characteristics of this model are non-linearity and non-convexity with linearly decomposed objective function and associated constraints.

MODEL D2. Model D1 can be reduced to a linear model as follows

$$(A) \quad \max z = \sum_{r=1}^s u_r y_{rk}, \text{ with conditions}$$

$\sum_{i=1}^m v_i x_{ik} = 1, u_r \geq 0, v_i \geq 0, \sum_{r=1}^s u_r y_{rj} - \sum_{i=1}^m v_i x_{ik} \leq 0, j=1, 2, \dots, n. u_r \geq \varepsilon, v_i \geq \varepsilon$ , where  $\varepsilon$  is a small positive value, i.e.  $\varepsilon > 0$ ,  $r = 1, 2, \dots, s, j = 1, 2, \dots, m$ ,

Model D2 maximizes the virtual output provided that its virtual input is equal to 1.

For model (A), the dual linear programming problem is

$$(B) \quad \theta^* = \min \theta,$$

with the conditions that is

$$\sum_{j=1}^n \lambda_j x_{ij} \leq \theta x_{ik}, i=1, 2, \dots, m, \sum_{j=1}^n \lambda_j y_{rj} \geq y_{rk}, r=1, 2, \dots, s, \lambda_j \geq 0, j=1, 2, \dots, n.$$

## RESEARCH RESULTS

The total efficiency of the selected banks was calculated using Excel Solver [25] to set the appropriate conditions of model D2 (B). The results are shown in Table 1. The research results indicate good efficiency for some banks, or wrong allocation or inefficient use of resources in the implementation of business activities for other banks for the observed period from 2017 to 2022. In addition, this research provides target values for improving the efficiency of business banks.

The results of the analysis of the efficiency of commercial banks in Serbia are presented in chapter 4.1, while the results of the analysis of the efficiency of commercial banks in Montenegro are presented in chapter 4.2.

## Efficiency of banks in Serbia

The results of the analysis of the efficiency of banks in Serbia in the period from 2017 to 2022, using model A, are shown in Table 1.

**Table 1. Efficiency of banks in Serbia - Model A**

Banks	2017	2018	2019	2020	2021	2022	Average
Addiko banka	64.71%	62.42%	77.60%	82.48%	100.00%	98.23%	80.91%
AIK banka	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Alta banka	54.99%	76.29%	67.38%	63.24%	68.90%	77.41%	68.03%
API banka	51.23%	29.05%	44.77%	25.41%	50.62%	55.67%	42.79%
Bank of China	100.00%	79.22%	100.00%	97.77%	100.00%	100.00%	96.17%
Banca Intesa	73.59%	88.34%	87.51%	48.99%	92.80%	76.10%	77.89%
Banka poštanska štedionica	48.54%	57.84%	54.02%	96.32%	68.19%	63.51%	64.74%
RBA banka	57.16%	65.80%	63.02%	70.43%	79.78%	79.63%	69.30%
Erste banka	78.32%	78.67%	71.81%	84.74%	90.83%	94.34%	83.12%
Euro banka	94.20%	89.77%	91.34%	56.56%	87.34%	71.42%	81.77%
Expo banka	100.00%	58.83%	51.19%	56.01%	57.37%	69.28%	65.45%
Halk banka	70.12%	73.35%	72.50%	71.31%	72.29%	65.79%	70.89%
Mira banka	22.58%	32.48%	27.75%	34.45%	36.38%	40.90%	32.42%
Mobi banka	25.73%	46.78%	40.73%	22.61%	51.95%	52.34%	40.02%
NLB Komercijalna banka	77.31%	68.57%	71.71%	72.36%	76.72%	100.00%	77.78%
3M banka	84.38%	96.75%	88.85%	90.40%	100.00%	100.00%	93.40%
Procredit banka	54.03%	68.38%	70.80%	75.68%	94.69%	100.00%	77.26%
Raiffeisen bank	100.00%	100.00%	100.00%	100.00%	100.00%	88.72%	98.12%
Srpska banka	69.33%	62.33%	67.24%	60.66%	71.60%	70.37%	66.92%
Unicredit banka	85.98%	100.00%	92.15%	99.61%	100.00%	90.80%	94.76%
OTP banka	69.32%	75.17%	74.93%	83.14%	98.33%	95.51%	82.74%
Average	70.55%	71.91%	72.16%	71.06%	80.85%	80.48%	

Source: authors based on data from financial reports of banks

As can be seen from Table 1, only AIK banka operated efficiently during the observed period. In other words, only this bank had 100% efficiency in all observed years. It is a bank that belongs to the large banks in terms of size. After AIK banka, the highest efficiency was recorded at Raiffeisen banka. The average efficiency of Raiffeisen banka during the observed period is 98.12%, and during the first five years that efficiency was 100%. Also, this bank belongs to the group of large banks. The lowest efficiency was recorded at Mira banka, which belongs to the group of small banks. The average efficiency of this bank in the period from 2017 to 2022 was 32.42%. After Mira banka, the lowest efficiency during the observed period was recorded at Mobi bank (average efficiency 40.02%). Observed by year, the lowest efficiency (70.55%) was recorded in 2017, while the highest (80.85%) was recorded in 2021.

Table 2 shows the value of chain indexes.

**Table 2. Chain indexes of efficiency of banks in Serbia - Model A**

Bank name	Chain index				
	2018/2017	2019/2018	2020/2019	2021/2020	2022/2021
Addiko banka	0.96	1.24	1.06	1.21	0.98
AIK banka	1.00	1.00	1.00	1.00	1.00
Alta banka	1.39	0.88	0.94	1.09	1.12
API banka	0.57	1.54	0.57	1.99	1.10
Bank of China	0.79	1.26	0.98	1.02	1.00
Banca Intesa	1.20	0.99	0.56	1.89	0.82
Banka Poštanska štedionica	1.19	0.93	1.78	0.71	0.93
RBA banka	1.15	0.96	1.12	1.13	1.00
Erste banka	1.00	0.91	1.18	1.07	1.04
Euro banka	0.95	1.02	0.62	1.54	0.82
Expo banka	0.59	0.87	1.09	1.02	1.21
Halk banka	1.05	0.99	0.98	1.01	0.91
Mira banka	1.44	0.85	1.24	1.06	1.12
Mobi banka	1.82	0.87	0.56	2.30	1.01
NLB Komercijalna banka	0.89	1.05	1.01	1.06	1.30

3M banka	1.15	0.92	1.02	1.11	1.00
Procredit banka	1.27	1.04	1.07	1.25	1.06
Raiffeisen banka	1.00	1.00	1.00	1.00	0.89
Srpska banka	0.90	1.08	0.90	1.18	0.98
Unicredit banka	1.16	0.92	1.08	1.00	0.91
OTP banka	1.08	1.00	1.11	1.18	0.97

Source: authors

Oscillations in the level of efficiency are present in the largest number of banks during the observed period (Table 2). Only at AIK banka, the level of efficiency is constant during the entire observed period. Also, a constant level of efficiency was recorded during the first five years at Raiffeisen banka. The biggest decrease and increase in efficiency was recorded at Mobi banka. That decrease, of 44%, was recorded in 2020 compared to 2019. On the other hand, the highest growth, of 130%, was recorded in 2021 compared to 2020.

The results of the analysis of the efficiency of banks in Serbia in the period from 2017 to 2022, using model B, are shown in Table 3.

**Table 3. Efficiency of banks in Serbia - Model B**

	2017	2018	2019	2020	2021	2022	Average
Addiko banka	37.74%	59.86%	62.86%	62.77%	50.60%	60.56%	55.73%
AIK banka	49.80%	49.64%	61.86%	91.58%	34.21%	26.46%	52.26%
Alta banka	31.35%	45.71%	43.74%	44.12%	35.95%	59.28%	43.36%
API banka	26.49%	36.39%	45.98%	38.78%	46.82%	58.59%	42.17%
Bank of China	100.00%	39.41%	73.91%	35.50%	42.38%	29.66%	53.48%
Banca Intesa	34.50%	63.71%	60.21%	57.19%	50.93%	55.60%	53.69%
Banka Poštanska štedionica	47.23%	55.07%	64.42%	100.00%	43.64%	50.29%	60.11%
RBA banka	34.73%	57.25%	58.57%	53.16%	41.93%	48.00%	48.94%
Erste banka	35.45%	46.00%	50.78%	48.68%	39.61%	42.94%	43.91%
Euro banka	37.74%	66.54%	60.34%	58.46%	28.57%	41.93%	48.93%
Expo banka	100.00%	47.26%	46.95%	45.12%	34.25%	66.57%	56.69%
Halk banka	34.14%	49.25%	50.20%	47.84%	40.05%	46.15%	44.60%
Mira banka	36.31%	58.37%	50.72%	57.92%	35.61%	50.70%	48.27%
Mobi banka	44.34%	100.00%	100.00%	100.00%	100.00%	100.00%	90.72%
NLB Komercijalna banka	45.45%	53.37%	54.53%	55.46%	45.55%	43.15%	49.58%
3M banka	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Procredit banka	33.79%	38.82%	42.05%	40.54%	33.48%	40.51%	38.20%
Raifaisen banka	32.89%	58.19%	60.45%	51.00%	43.79%	46.27%	48.77%
Srpska banka	16.84%	32.81%	33.51%	27.94%	28.64%	25.08%	27.47%
Unicredit banka	30.67%	41.30%	48.31%	46.65%	39.15%	44.18%	41.71%
OTP banka	29.58%	59.15%	45.72%	54.25%	32.96%	44.14%	44.30%
Average	44.72%	55.15%	57.86%	57.95%	45.15%	51.43%	

Source: authors based on data from financial reports of banks

As can be seen from Table 3, during the observed period, the highest level of efficiency was recorded at 3M banka and Mobi banka. 3M banka had an efficiency of 100% during the entire observed period. On the other hand, Unicredit banka achieved an average efficiency during the observed period of 90.72%, and in 5 out of 6 years it had an efficiency of 100%. The lowest level of efficiency was recorded by Srpska banka. Its average efficiency was 27.47%. Observed by year, the lowest efficiency (44.72%) was recorded in 2017, while the highest (57.95%) was recorded in 2020.

As can be seen from Table 4, oscillations in the level of efficiency of banks in Serbia were recorded when another approach is used to determine efficiency. The greatest increase in the level of efficiency was recorded at Mobi banka. Namely, this bank recorded a 126% increase in efficiency in 2018 compared to 2017. The biggest drop in the level of efficiency, of 61%, was recorded at the Bank of China in 2018 compared to 2017.

**Table 4. Chain indexes of efficiency of banks in Serbia - Model B**

Banks	Chain indexes				
	2018/2017	2019/2018	2020/2019	2021/2020	2022/2021
Addiko banka	1.59	1.05	1.00	0.81	1.20
AIK banka	1.00	1.25	1.48	0.37	0.77
Alta banka	1.46	0.96	1.01	0.81	1.65
API banka	1.37	1.26	0.84	1.21	1.25
Bank of China	0.39	1.88	0.48	1.19	0.70
Banca Intesa	1.85	0.95	0.95	0.89	1.09
Banka Poštanska štedionica	1.17	1.17	1.55	0.44	1.15
RBA banka	1.65	1.02	0.91	0.79	1.14
Erste banka	1.30	1.10	0.96	0.81	1.08
Euro banka	1.76	0.91	0.97	0.49	1.47
Expo banka	0.47	0.99	0.96	0.76	1.94
Halk banka	1.44	1.02	0.95	0.84	1.15
Mira banka	1.61	0.87	1.14	0.61	1.42
Mobi banka	2.26	1.00	1.00	1.00	1.00
NLB Komercijalna banka	1.17	1.02	1.02	0.82	0.95
3M banka	1.00	1.00	1.00	1.00	1.00
Procredit banka	1.15	1.08	0.96	0.83	1.21
Raiffeisen bank	1.77	1.04	0.84	0.86	1.06
Srpska banka	1.95	1.02	0.83	1.03	0.88
Unicredit bank	1.35	1.17	0.97	0.84	1.13
OTP banka	2.00	0.77	1.19	0.61	1.34

Source: authors

### The efficiency of banks in Montenegro

The results of the analysis of the efficiency of commercial banks in Montenegro in the period from 2017 to 2022, using model A, are shown in Table 5.

**Table 5. The efficiency of banks in Montenegro - Model A**

Banks	2017	2018	2019	2020	2021	2022	Average
Crnogorska komercijalna banka	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Hipotekarna banka	100.00%	100.00%	88.55%	83.34%	71.82%	85.58%	88.21%
Prva banka	84.25%	80.53%	76.79%	77.25%	64.51%	44.61%	71.32%
Erste banka	100.00%	100.00%	100.00%	100.00%	100.00%	49.93%	91.65%
NLB banka	100.00%	100.00%	100.00%	100.00%	83.31%	76.80%	93.35%
Addiko banka	82.73%	88.15%	84.28%	81.49%	80.57%	100.00%	86.20%
Universal capital banka	77.66%	96.27%	100.00%	100.00%	100.00%	100.00%	95.66%
Lovćen banka	99.54%	100.00%	100.00%	100.00%	100.00%	45.23%	90.79%
Zapad banka	75.77%	86.99%	55.62%	57.73%	63.95%	40.27%	63.39%
Zirrat banka	62.46%	65.56%	85.36%	80.81%	66.20%	32.97%	65.56%
Adriatic banka	28.14%	35.84%	35.55%	50.34%	100.00%	100.00%	58.31%
Average	82.78%	86.67%	84.20%	84.63%	84.58%	70.49%	

Source: authors based on data from financial reports of banks

During the observed period, the highest level of efficiency was recorded at Crnogorska komercijalna banka. Namely, this bank had an efficiency level of 100% during all six years. Universal capital banka (with an average efficiency of 95.66%), or NLB banka (with an average efficiency of 93.35%) is in second and third place, respectively, in terms of average efficiency. Universal capital banka had an efficiency level of 100% during the last four observed years, while NLB banka had an efficiency level of 100% during the first four observed years. The lowest level of average efficiency during the observed period was recorded at Adriatic bank (58.31%). Observed by year, the lowest efficiency (70.49%) was recorded in 2022, while the highest (86.67%) was recorded in 2018.

Table 6 shows the value of the chain indexes.

**Table 6. Chain indexes of efficiency of banks in Montenegro - Model A**

Banks	Chain indexes				
	2018/2017	2019/2018	2020/2019	2021/2020	2022/2021
Crnogorska komercijalna banka	1.00	1.00	1.00	1.00	1.00
Hipotekarna banka	1.00	0.89	0.94	0.86	1.19
Prva banka	0.96	0.95	1.01	0.84	0.69
Erste banka	1.00	1.00	1.00	1.00	0.50
NLB banka	1.00	1.00	1.00	0.83	0.92
Addiko banka	1.07	0.96	0.97	0.99	1.24
Universal capital banka	1.24	1.04	1.00	1.00	1.00
Lovćen banka	1.00	1.00	1.00	1.00	0.45
Zapad banka	1.15	0.64	1.04	1.11	0.63
Zirrat banka	1.05	1.30	0.95	0.82	0.50
Adriatic bank	1.27	0.99	1.42	1.99	1.00

Source: authors

At the largest number of banks in Montenegro during the observed period, oscillations in the level of efficiency are present. Only Crnogorska komercijalna banka recorded a constant level of efficiency during the entire observed period. A constant level of efficiency during the first 5 years was recorded at Erste banka. The highest increase in the level of efficiency, of 99%, was recorded at Adriatic banka in 2021 compared to 2020. The biggest drop in the level of efficiency, of 55%, was recorded at Lovćen banka in 2022 compared to 2021.

The results of the analysis of the efficiency of banks in Montenegro in the period from 2017 to 2022, using model B, are shown in Table 7.

**Table 7. Efficiency of banks in Montenegro - Model B**

Banks	2017	2018	2019	2020	2021	2022	Average
Crnogorska komercijalna banka	96.16%	83.70%	76.17%	84.70%	95.85%	81.34%	86.32%
Hipotekarna banka	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Prva banka	65.93%	60.22%	60.06%	73.93%	85.69%	62.32%	68.02%
Erste banka	88.59%	92.74%	87.36%	79.65%	85.18%	63.42%	82.83%
NLB banka	98.57%	88.48%	81.61%	90.17%	81.38%	81.55%	86.96%
Addiko banka	86.97%	100.00%	100.00%	100.00%	100.00%	100.00%	97.83%
Universal capital banka	34.96%	41.93%	64.22%	70.01%	61.94%	55.92%	54.83%
Lovćen banka	100.00%	100.00%	87.54%	82.44%	72.20%	46.82%	81.50%
Zapad banka	97.52%	91.44%	42.33%	65.85%	51.07%	28.80%	62.83%
Zirrat banka	93.91%	100.00%	65.46%	100.00%	95.76%	49.35%	84.08%
Adriatic banka	46.29%	59.39%	59.34%	43.13%	78.01%	52.27%	56.41%
Average	82.63%	83.45%	74.92%	80.90%	82.46%	65.62%	

Source: authors based on data from financial reports of banks

The highest level of efficiency in the period from 2017 to 2022 was recorded at Hipotekarna banka and Addiko banka. Namely, during all six years, Hipotekarna banka had 100% efficiency. On the other hand, Addiko banka only in the first observed year did not have 100% efficiency, but 86.97%. Thus, the average efficiency of Addiko banka during the observed period is 97.83%. The lowest level of efficiency was recorded at Adriatic banka and its average efficiency was 56.41%. Observed by year, the lowest average efficiency was recorded in 2022 (65.62%), while the highest was recorded in 2018 (83.45%).

As can be seen from Table 8, the largest number of banks in Montenegro have oscillations in the level of efficiency during the observed period. At Hipotekarna banka a constant level of efficiency was recorded during the observed period, while at Addiko bank, that level was recorded during the last five years. The highest increase in the level of efficiency, of 81%, was recorded at Adriatic banka in 2021 compared to 2020. On the other hand, the biggest drop in the level of efficiency, of 56%, was recorded at Zapad banka in 2019 compared to 2018.

**Table 8.** Chain efficiency indexes of banks in Montenegro - Model B

Banks	Chain indexes				
	2018/2017	2019/2018	2020/2019	2021/2020	2022/2021
Crnogorska komercijalna banka	0.87	0.91	1.11	1.13	0.85
Hipotekarna banka	1.00	1.00	1.00	1.00	1.00
Prva banka	0.91	1.00	1.23	1.16	0.73
Erste banka	1.05	0.94	0.91	1.07	0.74
NLB banka	0.90	0.92	1.10	0.90	1.00
Addiko banka	1.15	1.00	1.00	1.00	1.00
Universal capital banka	1.20	1.53	1.09	0.88	0.90
Lovćen banka	1.00	0.88	0.94	0.88	0.65
Zapad banka	0.94	0.46	1.56	0.78	0.56
Zirrat banka	1.06	0.65	1.53	0.96	0.52
Adriatic banka	1.28	1.00	0.73	1.81	0.67

Source: authors

## DISSCUSSION

In this paper, we measured the relative efficiency of commercial banks in two developing countries in Europe - Serbia and Montenegro using the DEA method, for two combinations of variables (two models). For the observed period of five years (2017–2022), balanced panel data were used for both observed samples. Productivity and efficiency are essential metrics to realize company goals and diagnose critical points for performance improvement. “The CCR efficiency measure also reflects any inefficiencies due to divergence from the most productive scale size” [27].

According to model A, the average efficiency of the Serbian banking sector in the first observed year was 70.55%, while in the last observed year it was 80.48%. According to model B, the average efficiency of the Serbian banking sector in 2017 was 44.72%, and in 2022 it was 51.43%.

When it comes to the average efficiency of the banking sector of Montenegro, using model A, it was 82.78% in 2017, and it was 70.49% in 2022. According to model B, the average efficiency in 2017 was 82.36% and in 2022 it was 65.62%. This research suggests that banks in Serbia and Montenegro showed different efficiency during the observed five-year period. It is obvious that these two countries had different dynamics and challenges in their banking sectors.

The rationale for reducing the efficiency of banks in Montenegro should be investigated in a broader political and economic context [26]. Serbia and Montenegro are still candidate countries for EU membership. In addition to the broader political and economic context, it would also be useful to consider specific factors or changes in the banking sector of both countries that could contribute to the decrease in efficiency.

This research provides an important insight into the effectiveness of the banking sectors in Serbia and Montenegro. Furthermore, continuous monitoring and further analysis can help identify key areas for improvement and optimization of efficiency in those sectors to support economic growth and stability.

## CONCLUSION

The aim of this paper was to present the application of an adequate method used in the assessment of the efficiency of banks, based on inputs from financial reports. Therefore, in this paper, the emphasis is placed on two different models (input and output combinations) to evaluate efficiency using the DEA method.

The research results can usefully serve managers and other interest groups (investors) who want insight into the efficiency of commercial banks. Based on the received efficiency data, it was identified for which banks and in which periods the efficiency was unsatisfactory, which certainly affected the financial viability of the observed financial organizations.

The results of this study can be further investigated by expanding the size of inputs and outputs and including a larger sample, that is, all the countries that make up the Western Balkans. The results of the research can usefully serve bank managers and other interest groups (investors) who want insight into the efficiency of the observed business banks. Based on the obtained efficiency data, it was identified for which banks and in which periods the efficiency was unsatisfactory, which certainly affected the

financial sustainability of the observed banks. Productivity and efficiency are essential metrics to realize banks' goals and diagnose critical points for performance improvement.

## REFERENCES

- [1] Fotova Čikovic, K., & Cvetkoska, V. (2017). Efficiency of the Macedonian banking sector: A non-parametric approach. *CEA Journal of Economics*, 12(2), pp. 17-26
- [2] Qamruzzaman, M., & Jianguo, W. (2016). An assessment of financial efficiency using Data Envelopment Analysis (DEA) - Multistage approach: A case study of Banks in Bangladesh. *Journal of Economics and Finance*, 7(6), pp. 96-103
- [3] Bou-Hamad, I., Anouze, A.L. & Osman, I. H. (2022). A cognitive analytics management framework to select input and output variables for data envelopment analysis modeling of performance efficiency of banks using random forest and entropy of information. *Annals of Operations Research*, 308, pp. 63–92. <https://doi.org/10.1007/s10479-021-04024-0>
- [4] Novickytė, L., & Drożdż, J. (2018). Measuring the Efficiency in the Lithuanian Banking Sector: The DEA Application. *International Journal of Financial Studies*, 6(2), 37. <https://doi.org/10.3390/ijfs6020037>
- [5] Bulajić, M., Jeremić, V., Knežević, P. S., & Žarkić Joksimović, N. (2013). A statistical approach to evaluating efficiency of banks. *Ekonomika istraživanja (Economic research)*, 26(4), pp. 91–100. <https://doi.org/10.1080/1331677X.2013.11517632>
- [6] Knežević, S., Marković, M., & Barjaktarović Rakočević, S. (2012). Assessing Efficiency in Banking. *Industrija*, 3, pp. 71-92
- [7] Hoque, M. R., & Rayhan, M. I. (2013). Efficiency Measurement on Banking Sector in Bangladesh. *Dhaka University Journal of Science*, 61(1), pp. 1–5. <https://doi.org/10.3329/dujs.v61i1.15088>
- [8] Milošević, M., Stojiljković, M., Raičević, J., & Milojević, S. (2023). Obrazovanje i obuka u oblasti strateškog finansijskog menadžmenta i kontrole: u kom pravcu bi trebalo da idemo? *Revizor*, 26(102-103), str. 25–36. <https://doi.org/10.56362/Rev23102025M>
- [9] Knežević, S., Stanković, A., & Tepavac, R. (2012). Accounting Information System as a Platform for Business and Financial Decision-Making in the Company. *Management - časopis za teoriju i praksu menadžmenta*, 17(65), pp. 63-69
- [10] Milašinović, M., Knežević, S. & Mitrović, A. (2022). The significance of audit and audit opinions in the contemporary environment. *Revizor*, 25(97-98), str. 21–31. <https://doi.org/10.56362/Rev2298021M>
- [11] Cooper, W.W., Seiford, L.M., Zhu, J. (2011). *Data Envelopment Analysis: History, Models, and Interpretations*. In: *Handbook on Data Envelopment Analysis*, pp. 1-39, Springer. [http://dx.doi.org/10.1007/978-1-4419-6151-8\\_1](http://dx.doi.org/10.1007/978-1-4419-6151-8_1)
- [12] Fukuyama, H., Hashimoto, A., Matousek, R., & Tzeremes, N.G. (2021). Analyzing bank “black boxes”: A two-stage Nerlovian profit inefficiency model. *Expert Systems with Applications*, 183, 115405. <https://doi.org/10.1016/j.eswa.2021.115405>
- [13] Lukić, R., Sokic, M., & Kljenak, D. V. (2017). Efficiency analysis of banking sector in Republic of Serbia. *Business excellence and Management*, 7(4), pp. 5-17
- [14] Lukić, R. (2021). Analiza efikasnosti finansijskih institucija u Srbiji na bazi OCRA metode. *Tehnika – menadžment*, 71(1), pp. 103-111
- [15] Lukić, R. (2023). Application of PROMETHEE Method in Evaluation of Insurance Efficiency in Serbia. *Revija za ekonomske in poslovne vede*, 10(1), pp. 3-19.
- [16] Ahn, H., & Le, M. H. (2014). An insight into the specification of the input-output set for DEA-based bank efficiency measurement. *Managing Review Quarterly*, 64, pp. 3–37. <https://doi.org/10.1007/s11301-013-0098-9>
- [17] Čiković, K. F., Lozić, J., & Guzvovski, M. (2022). Do mergers and acquisitions improve bank efficiency? Evidence from North Macedonia. *Journal of International Studies*, 15(2), pp. 77-93
- [18] Tandon, D., Tandon, K., & Malhotra, N. (2014). An Evaluation of the Technical, Pure Technical and Scale Efficiencies in the Indian Banking Industry using Data Envelope Analysis. *Global Business Review*, 15(3), pp. 545–563. <https://doi.org/10.1177/0972150914535141>
- [19] Guzvovski, M., Rudančić, A., & Zgurić Dobrenić, V. (2022). Distribution channels of banking services: Attitudes and preferences of clients. *International Review*, 1-2, pp. 24-30. <https://doi.org/10.5937/intrev2202029G>
- [20] Ristanović, V., & Mirković, S. (2023). Ocena profitabilnosti bankarskog sektora u Srbiji. *Revizor*, 26, 102-103, pp. 71–81. <https://doi.org/10.56362/Rev23102071R>
- [21] Charnes, A., Cooper, W. W. & Rhodes, E (1978). Measuring the efficiency of decision-making units. *European Journal of Operation Research*, 2, pp. 429-444

- [22] Susanty, A., Hartini, S., Puspitasari, D., & Arsiwi, P. (2015). Measuring Efficiency of Using Resource in the Production Process of Making Stamped-Batik: A DEA Approach. *Mediterranean Journal of Social Sciences*, 6(5), pp. 317-327. <http://dx.doi.org/10.5901/mjss.2015.v6n5s2p318>
- [23] Lekić, N., Savić, G., Knežević, S., & Mitrović, A. (2018). The efficiency analysis in small wineries in the Republic of Serbia. *Economics of Agriculture*, 65(4), pp. 1529-1544. <https://doi.org/10.5937/ekoPolj1804529L>
- [24] Banker, R. D., Charnes, A., & Cooper, W.W. (1984). Some models for estimating technical and scale inefficiencies in data envelopment analysis. *Management Science*, 30(9), pp. 1078-1092.
- [25] Cooper, W. W., Seiford, L. M., & Tone, K. (2006). *Introduction to Data Envelopment Analysis and Its Uses: With DEA-Solver Software and References*. New York: Springer
- [26] Cvetkoska, V., Fotova Ciković, K., & Tasheva, M. (2021). Efficiency of Commercial Banking in Developing Countries. *Mathematics*, 9, 1597. <https://doi.org/10.3390/math9141597>
- [27] Banker, R. D. (1984). Estimating most productive scale size using data envelopment analysis. *European journal of operational research*, 17(1), pp. 35-44

**Article history:**

Received 14 November 2023

Accepted 16 December 2023

# A BOOTSTRAP EFFICIENCY ANALYSIS BASED ON ECONOMIC SENSITIVITY FOR THE FIRST TERM OF COVID-19

TOPÇUOĞLU Özlem<sup>1</sup>, BOZKURT Eda<sup>2</sup>, ALTINER Ali<sup>3</sup>

<sup>1</sup>Atatürk University, Vocational School of Social Sciences, Department of Foreign Trade (TURKEY)

<sup>2</sup>Atatürk University, Faculty of Open Education, Department of Foreign Trade (TURKEY)

<sup>3</sup>Recep Tayyip Erdoğan University, Faculty of Economics and Administrative Sciences, Department of Economics (TURKEY)

E-mails: ozlemgunduz@atauni.edu.tr, edabozkurt@atauni.edu.tr, ali.altiner@erdogan.edu.tr

## ABSTRACT

*No situation similar to the Covid-19 pandemic on a global scale has been encountered in the world lately. The uncertainty caused by the nature of the disease at the time of the emergence of Covid-19 also led to the fact that the methods of struggling with it were not fully known. Governments have started to implement strategies to combat the pandemic. However, it is debated whether the interventions of the countries are fast, serial, and effective enough. Although it is accepted that the Covid-19 crisis caused an unprecedented economic downsizing after the great depression of 1929, it is also known that countries responded seriously. In this study, the performance of countries in the pandemic was handled from an economic point of view, taking into account the Covid-19 parameters. Bootstrap Efficiency analyses conducted in 24 European countries during the period March 2020-March 2021 revealed that the countries did not exert full efficiency in terms of economic sensitivity which was used as output. The results indicated that countries should be more prepared for future risks related to the fight against the virus when assessed from an economic point of view.*

**Keywords:** covid-19, economic sensitivity, efficiency, European countries

**JEL:** D60, F00, I15, O47

**DOI:** 10.5937/intrev2304191T

**UDC:** 005.336.1:005.5

658:005.334(4)

**COBISS.SR-ID** 133932553

## INTRODUCTION

From the past to the present, pandemics have appeared on Earth many times. The global catastrophe of the 21st century is considered to be the Covid-19 pandemic. Covid-19 is known as a subtype of Coronavirus that is recognized well worldwide. This family of viruses first manifested itself in 2003 with the SARS pandemic. Like Covid-19, the SARS virus was first seen in China. Subsequently, the pandemics of MERS emerged in Saudi Arabia and Ebola in West Africa. The common feature of all three pandemics is that the known transmission ways originated from animals. In particular, coronaviruses transmitted via droplets can lead people to death with symptoms such as fever, cough, muscle pain, and shortness of breath. Although SARS, MERS, and the Ebola pandemic are known at the global level, Covid-19 has had a much more devastating impact in terms of indicators such as the area where it has spread, the number of cases, and death rates ([1], [2], [3]). Shortly after 31 December 2019, when China reported the disease to the World Health Organization (WHO), the first death due to Covid-19 was announced on 11 January 2020, and the WHO declared it a pandemic on 11 March 2020 [4]. The impact of Covid-19 on human health has been quite devastating. Millions of people lost their lives. For the pace of the pandemic to slow down, governments were forced to implement mandatory practices. The idea that the contagiousness of the disease would be broken depending on the distance and isolation pushed people to stay at home compulsorily. At this point, especially the places where people coexist, such as gyms, cafes, restaurants, and public-private sector workplaces were closed, face-to-face education in schools was stopped, and distance education was started. Curfews were even imposed. The global pandemic has significantly affected cultural, social, and economic activities along with these measures. Especially when judged from an economic perspective, there have been negativities in individuals, households, and firms at the micro-level and in the country's economies at the macro dimension, as well as in international economic relations.

Unlike past global crises, the crisis caused by the Covid-19 pandemic does not depend on a specific main source. The crisis caused by the global pandemic is a very comprehensive crisis in which demand, supply, and financial shocks are seen together. In the crisis that started due to Covid-19, the cessation of activities in some sectors, especially based on restriction policies, resulted in a shrinking in demand based on loss of income. On the other hand, in addition to the destruction experienced in production chains and supply structure, the decrease in employment has manifested itself as a supply shock in economies. With the collapse in asset values in both local and global financial markets, financial capital values have reached the point of evaporation [5]. Of course, the findings of the disease cannot be expected to decrease the economic growth rate, decrease the stock markets, increase inflation and increase unemployment alone. But it can be said that quarantine-based measures taken by governments have turned into a package of economic tightening while slowing the spread of the disease. For example, it seems unlikely that travel companies will gain value on the stock market in a circle where travel restrictions are increasing. Similarly, the revenues of sports clubs decreased during the period when matches were played without spectators. Conversely, the increase in demand for the food and retail sector has led to the transformation of the pandemic into an opportunity for these companies [6].

While scrutinizing the effects of the pandemic in daily life, the most important issue on the agenda was the performance of countries in the fight against the disease. For this reason, the Covid-19 process management activities of countries have been investigated by researchers. For example, Ergülen et al. [7] handled the efficiency of the Ministry of Health of the Republic of Turkey in the Covid-19 Process of April, May, June, July, August, September, and October 2020 in Turkey through Data Envelopment Analysis (DEA). In the study consisting of two analyses, the number of patients and the number of tests were selected as input variables in the first case, and the number of patients and the number of tests were selected as input variables in the second case. The output variables were determined as the number of deaths in the first case and as the number of recovered patients in the second case. The results showed that April, May, July, and September achieved full efficiency, while June, August, and October did not achieve full efficiency. In addition, April, May, and September achieved full efficiency according to the number of deaths, while June, July, August, and October did not achieve full efficiency. In another study, Selamzade and Özdemir [8] investigated the efficiency of the Organization for Economic Co-operation and Development (OECD) countries in the fight against Covid-19. In the analysis based on DEA, the number of doctors, nurses, and hospital beds per ten thousand people, and the ratio of health expenditures to Gross Domestic Product (GDP) were used as input variables. The number of tests, the

number of cases, and the number of deaths per million people constituted the outputs. Eight countries were found to exert efficiency as a result of the test conducted with the Charnes Cooper Rhodes (CCR), and 11 countries were found to exert efficiency as a result of the analysis of the Banker Charnes Cooper (BCC). Shirouyehzad et al. [9] calculated global efficiency with DEA for countries that have been at least one month since the first confirmed case of Covid-19 on March 25, 2020. The inputs are the country population density and average of 13 IHRCCS in the first stage and the variables of the confirmed case in the second stage. Confirmed cases were selected in the first stage, and the number of death cases and the number of recovered cases were selected in the second stage. The average efficiency was 0.879 for the first stage and 0.627 for the second stage. Aydın and Yurdakul [10] conducted a performance evaluation using clustering analysis, weighted stochastic improve data acquisition analysis (WSIDEA), and machine learning algorithms in 142 countries. The inputs were total deaths, stringency index, extreme poverty, CVD death rate, diabetes prevalence, female smokers, and male smokers, while the outputs were population, GDP, hospital beds, total recovered patients, and total tests. As a result of the analysis, it was found that the optimum number of clusters for 42 countries was three. In addition, 20 out of 142 countries were identified to achieve full efficiency. Finally, it was observed that data such as GDP, smoking rates, and diabetes patient rates did not affect the efficiency level of countries.

It is known that the most severe impact of the Covid-19 pandemic is on economies following health. It is seen that some economic indicators are also included in the literature studies investigating the efficiencies of countries in the field of health. Based on this, the main purpose of the study is to determine how Covid-19 changes economic efficiency. In the study, the efficiency of the impact of Covid-19 on the economy was calculated by taking into account the economic sentiment indicator (ECOSENTIMENT) published by the European Statistical System (Eurostat) [11]. The ECOSENTIMENT indicator is calculated monthly for European countries that are members and candidates of the European Union and thus used to monitor GDP growth. As is known, Covid-19 data (number of cases, number of recovered patients, number of deaths, etc.) is published daily. The data can be converted into monthly and annual forms. However, there are no indicators to represent economic growth daily. For this reason, the ECOSENTIMENT variable was used in the analyses. Thus, the performance levels of the countries were measured by combining economic parameters with the indicators of the Covid-19 crisis in the early period (number of confirmed cases, rate of transmission, number of tests, number of deaths, number of recoveries, etc.). The next part of the research continued with the methodology and findings sections where detailed information was presented. It was completed with the discussion section in which the results were discussed.

## **METHODOLOGY**

Pandemics lead to significant changes in economic, social, political, and administrative aspects, as well as the occurrence of death cases in societies. The number of cases of infection and death in a society in the process of a pandemic in a country and their rate of spread largely depend on the readiness and strength of the health system of that country [8]. The number of confirmed cases, the rate of infection, the number of tests, the strictness of the measures, the number of deaths and the number of recoveries and the economic sensitivity indicators realized in the relevant period reveal the performance in the response to the pandemic. It is expected that these indicators, which provide a serious insight, will also reveal the efficiency of the country in combating the pandemic and reflecting it on the economy.

In the light of these evaluations, the present study aims to determine the first-term efficiency scores of the pandemic for 24 countries affected by the Covid-19 pandemic. In the evaluation of efficiency, DEA was preferred as a method that provides the ability to calculate the relative efficiency of each unit.

## **MEASURING EFFICIENCY SCORES: DATA ENVELOPMENT ANALYSIS (DEA)**

The main approach used in the calculation of efficiency values in the study is DEA. DEA is a model that includes efficient and inefficient Decision-Making Units (DMU). The linear efficiency limit formed by the efficient ones forms an “envelope” surrounding all the observations, and the efficiency scores of all the observations are determined according to this envelope curve [12]. The approach that was first used only for measuring technical efficiency under the CCR assumption was later modified by Banker, Charnes, and Cooper [13] to make it possible to measure scale efficiency under the BCC assumption.

DEA is a model that allows multi-input and multi-output efficiency analyses to be performed. In the model based on calculating the efficiency score of each DMU, the efficiency of the DMU is measured in the form of the ratio of weighted total outputs to total inputs:

$$\text{Max } e_j = \frac{\sum_{r=1}^s u_{rj} Y_{rj}}{\sum_{i=1}^m v_{ij} X_{ij}} \quad (1)$$

Where  $j$  represents DMU, and  $Y_{rj}$ ,  $r = 1, \dots, s$  represents the number of output factors produced by the DMU, and  $X_{ij}$ ,  $i = 1, \dots, m$  indicates the number of input factors. The weights loaded by  $j$  into the input and output factors are represented by  $v_{ij}$  and  $u_{rj}$  [14].

The weights given by the method to the inputs and outputs cannot have a negative value, and the efficiency of any DMU can exceed 1,000. Thus, many weight sets can be selected for DMUs, and there is usually a tendency to give the highest weight to the least used inputs and the most produced outputs for DMUs. In the DEA, which aims to measure how effectively the DMU uses resources to create an output set, the fact that the value of  $(\sum_{r=1}^s u_{rj} Y_{rj})$  function is equal to 1,000 means that the DMU is efficient, in other cases, it is not efficient [15].

## BOOTSTRAP IN EFFICIENCY

If it is difficult or impossible to obtain the sample distribution of an estimator using an asymptotic approach, and if the information about the data generation process of observations is not enough, the Bootstrap method, which is a statistical resampling method, is used. This method, proposed by Efron [16], is often used in complex problems. The main idea of this method is to create an artificial sampling distribution of the estimator of interest by making a certain number of repeated samples from the available mass sample. The Bootstrap method, which is used to make some inferences about the sample distribution, was later developed by Efron and Tibshirani [17] for some statistical inferences such as confidence interval. The data generation process takes place by resampling the original dataset to produce a set of samples taken each time the Bootstrap is repeated. The model can be estimated experimentally by applying the obtained Bootstrap samples to the original estimators. Thus, the samples created by the Bootstrap method reflect the statistical characteristics of the main sample [18].

The Bootstrap DEA method was developed by Ferrier and Hirschberg [19], as well as Simar and Wilson [20], to overcome the main deficiency of basic DEA analysis, namely the precision of sampling results, by determining confidence intervals of DEA efficiency scores. The Bootstrap DEA method was later developed by Simar and Wilson ([21], [22], [23]). In these studies, they aimed to remove the dependency between the efficiency scores and to evaluate the statistical characteristics of nonparametric efficiency scores resulting from the process of producing some unobservable data. Thus, a method has been developed with different studies to obtain the bias of DEA efficiency scores. Due to the statistical limitations of the DEA method, the Bootstrap DEA method is often used. Based on repeating the original data  $B$  times, DEA efficiency scores are recalculated with each repetition.

Based on the original DEA estimator  $\theta_{DEA}(x, y)$ , the Bootstrap deviation estimation values are calculated as follows:

$$BIAS_B(\hat{\theta}_{DEA}(x, y)) = B^{-1} \sum_{b=1}^B \hat{\theta}_{DEA,b}^*(x, y) - \hat{\theta}_{DEA}(x, y) \quad (2)$$

In the formula,  $\hat{\theta}_{DEA,b}^*(x, y)$  indicates the Bootstrap value, and  $B$  indicates the Bootstrap repetition count. The deviation-corrected estimator  $(x, y)$  can be calculated from the formula as follows:

$$\hat{\theta}_{DEA}(x, y) = \hat{\theta}_{DEA}(x, y) - BIAS_B(\hat{\theta}_{DEA}(x, y)) = 2\hat{\theta}_{DEA}(x, y) - B^{-1} \sum_{b=1}^B \hat{\theta}_{DEA,b}^*(x, y) \quad (3)$$

This deviation correction process performed according to Simar and Wilson [24], may cause an additional error. Therefore, the sample variance of the estimated Bootstrap values  $\hat{\theta}_{DEA,b}^*(x, y)$  is calculated as:

$$\hat{\sigma}^2 = B^{-1} \sum_{b=1}^B [\hat{\theta}_{DEA,b}^*(x, y) - B^{-1} \sum_{b=1}^B \hat{\theta}_{DEA,b}^*(x, y)]^2 \quad (4)$$

## EMPIRICAL RESULTS

In the study, 4 input and 2 output variables were used for 24 countries influenced by the pandemic. As input variables, the number of confirmed cases (NEWCASE), transmission rate of the disease (REPRODUCTION), the number of tests (NEWTEST), and stringency index (STRINGENCY) were determined. Also, as the output variables, the number of deaths (NEWDEAD), the number of recovered patients (RECOVERED), and the economic sentiment indicator (ECOSENTIMENT) variables were determined. The data were obtained from the Eurostat [11] and the Humanitarian Data Exchange databases [25]. The results were reported separately with the original and Bootstrap calculations as CCR and BCC. Table 1 demonstrates the original one-year CCR values of the countries in the analyses (March 2020-March 2021).

According to Table 1, the average efficiency value for March 2021 was 0.651. The efficiency value of the relevant period was well below the full efficiency value (1,000), and only France was able to reach the full efficiency level during this period. In April, this number increased to 5 (Albania, Croatia, France, Italy, and Slovenia), and the average number of efficiency increased by 15% compared to the previous month. A full efficiency was observed in 6 countries (Albania, Croatia, Cyprus, Ireland, Italy, and Latvia) in the May period, though it was one of the periods when the average efficiency level was high. Also, in the June period, 6 countries consisting of Albania, Estonia, Ireland, Lithuania, Luxembourg, and Malta reached the full efficiency level. In July, only Luxembourg was seen to have full efficiency, while in August, September, October, and November, no country achieved full efficiency in terms of original CCR values, and the average efficiency value of these 4 periods decreased by 7.32% compared to the previous period, decreasing to 0.696.

*Table 1. Original CCR Efficiency Scores*

Country	ORIGINAL CCR												
	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER	JANUARY	FEBRUARY	MARCH
Albania	0.841	<b>1.000</b>	<b>1.000</b>	<b>1.000</b>	0.896	0.936	0.859	0.677	0.708	0.664	0.711	0.741	<b>1.000</b>
Austria	0.657	0.625	0.664	0.733	0.767	0.739	0.571	0.527	0.722	0.632	0.644	0.682	0.938
Bulgaria	0.572	0.673	0.708	0.706	0.783	0.792	0.656	0.693	0.818	0.819	0.690	0.681	0.965
Croatia	0.786	<b>1.000</b>	<b>1.000</b>	0.805	0.944	0.989	0.850	0.820	0.816	0.946	<b>1.000</b>	0.994	0.895
Cyprus	0.638	0.867	<b>1.000</b>	0.738	0.702	0.649	0.558	0.524	0.529	0.565	0.500	0.513	0.635
Denmark	0.454	0.532	0.617	0.617	0.615	0.598	0.704	0.663	0.689	0.772	0.702	0.688	0.805
Estonia	0.626	0.704	0.899	<b>1.000</b>	0.985	0.829	0.893	0.736	0.720	0.785	0.812	0.688	0.871
Finland	0.511	0.659	0.887	0.949	0.803	0.772	0.776	0.731	0.720	0.739	0.683	0.727	0.949
France	<b>1.000</b>	<b>1.000</b>	0.616	0.620	0.591	0.683	0.689	0.881	0.852	0.810	0.859	0.771	0.890
Germany	0.650	0.755	0.667	0.691	0.645	0.706	0.601	0.722	0.864	<b>1.000</b>	<b>1.000</b>	0.897	<b>1.000</b>
Greece	0.776	0.787	0.703	0.671	0.631	0.647	0.610	0.567	0.717	0.596	0.527	0.557	0.748
Hungary	0.636	0.803	0.999	0.660	0.616	0.606	0.686	0.578	0.745	0.726	0.635	0.623	0.982
Ireland	0.418	0.731	<b>1.000</b>	<b>1.000</b>	0.578	0.588	0.546	0.670	0.519	0.509	0.697	0.616	0.802
Italy	0.955	<b>1.000</b>	<b>1.000</b>	0.777	0.622	0.658	0.539	0.774	0.934	0.845	0.826	0.828	<b>1.000</b>
Latvia	0.716	0.722	<b>1.000</b>	0.756	0.831	0.818	0.776	0.664	0.624	0.638	0.671	0.686	0.745
Lithuania	0.585	0.743	0.955	<b>1.000</b>	0.966	0.974	0.727	0.613	0.647	0.756	0.750	0.747	<b>1.000</b>
Luxembourg	0.879	0.985	0.827	<b>1.000</b>	0.763	0.716	0.680	0.700	0.764	0.739	0.759	0.990	0.990
Malta	0.664	0.596	0.918	<b>1.000</b>	0.739	0.816	0.677	0.618	0.710	0.668	0.697	0.686	<b>1.000</b>
Portugal	0.446	0.462	0.497	0.586	0.602	0.589	0.542	0.589	0.665	0.594	<b>1.000</b>	<b>1.000</b>	<b>1.000</b>
Romania	0.409	0.514	0.638	0.658	0.751	0.740	0.645	0.636	0.720	0.734	0.883	0.830	<b>1.000</b>
Slovakia	0.465	0.944	0.744	0.851	0.891	0.884	0.570	0.577	0.603	0.657	0.675	0.740	0.976
Slovenia	0.636	<b>1.000</b>	0.772	0.831	0.857	0.679	0.572	0.549	0.577	0.692	0.804	0.787	<b>1.000</b>
Spain	0.957	0.795	0.856	0.518	0.515	0.626	0.630	0.766	0.674	0.626	0.954	0.813	0.805
Turkey	0.361	0.494	0.530	0.664	0.696	0.672	0.659	0.531	0.940	<b>1.000</b>	<b>1.000</b>	<b>1.000</b>	<b>1.000</b>
Mean	0.651	0.766	0.812	0.785	0.751	0.740	0.669	0.658	0.717	0.731	0.769	0.752	0.917

*Table 2. Bootstrap CCR Efficiency Scores*

Country	BOOTSTRAP CCR												
	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER	JANUARY	FEBRUARY	MARCH
Albania	0.716	0.805	0.862	0.844	0.801	0.859	0.791	0.626	0.649	0.620	0.664	0.654	0.830
Austria	0.606	0.569	0.620	0.698	0.733	0.690	0.534	0.508	0.664	0.578	0.594	0.647	0.890
Bulgaria	0.521	0.629	0.657	0.677	0.754	0.756	0.603	0.644	0.719	0.707	0.620	0.613	0.888
Croatia	0.719	0.807	0.832	0.747	0.876	0.947	0.776	0.755	0.759	0.830	0.815	<b>0.893</b>	0.806
Cyprus	0.578	0.777	0.870	0.636	0.658	0.594	0.534	0.500	0.509	0.521	0.464	0.497	0.613
Denmark	0.425	0.484	0.574	0.580	0.587	0.575	0.673	0.634	0.665	0.721	0.645	0.640	0.757
Estonia	0.580	0.624	0.799	0.797	0.894	0.758	<b>0.847</b>	0.702	0.694	0.753	0.775	0.647	0.799
Finland	0.474	0.608	0.822	0.853	0.722	0.719	0.746	0.702	0.699	0.716	0.661	0.700	0.911
France	0.792	0.803	0.577	0.587	0.548	0.656	0.642	<b>0.803</b>	0.795	0.741	0.795	0.741	0.861
Germany	0.601	0.683	0.617	0.641	0.608	0.666	0.563	0.693	0.781	0.823	0.815	0.788	0.848
Greece	0.706	0.714	0.657	0.635	0.607	0.628	0.588	0.547	0.663	0.551	0.509	0.537	0.726
Hungary	0.550	0.694	<b>0.874</b>	0.598	0.576	0.568	0.639	0.551	0.695	0.651	0.570	0.568	0.889
Ireland	0.364	0.661	0.812	0.847	0.547	0.567	0.525	0.623	0.500	0.492	0.657	0.577	0.772
Italy	0.815	0.852	0.832	0.667	0.563	0.621	0.499	0.691	0.817	0.745	0.722	0.726	0.814
Latvia	0.667	0.651	0.826	0.669	0.746	0.735	0.716	0.640	0.593	0.611	0.641	0.651	0.701
Lithuania	0.532	0.677	0.869	0.829	0.866	<b>0.890</b>	0.698	0.581	0.623	0.694	0.665	0.667	0.823
Luxembourg	0.806	<b>0.878</b>	0.746	<b>0.865</b>	<b>0.935</b>	0.720	0.690	0.649	0.653	0.705	0.698	0.719	<b>0.941</b>
Malta	0.592	0.532	0.802	0.842	0.698	0.777	0.648	0.592	0.675	0.640	0.665	0.629	0.829
Portugal	0.416	0.430	0.476	0.549	0.573	0.567	0.522	0.572	0.634	0.550	0.859	0.807	0.811
Romania	0.368	0.462	0.607	0.619	0.709	0.698	0.597	0.600	0.637	0.629	0.768	0.715	0.809
Slovakia	0.419	0.840	0.669	0.786	0.820	0.803	0.540	0.560	0.588	0.632	0.642	0.701	0.904
Slovenia	0.561	0.793	0.660	0.746	0.771	0.645	0.551	0.507	0.514	0.617	0.704	0.686	0.858
Spain	<b>0.819</b>	0.705	0.772	0.471	0.493	0.611	0.613	0.730	0.648	0.596	<b>0.878</b>	0.760	0.782
Turkey	0.337	0.462	0.504	0.626	0.644	0.634	0.615	0.485	<b>0.860</b>	<b>0.857</b>	0.820	0.877	0.813
Mean	0.582	0.672	0.722	0.700	0.697	0.695	0.631	0.620	0.668	0.666	0.694	0.685	0.820

This situation started to improve partially since 2 countries (Germany and Turkey) reached the full efficiency level in December. Full efficiency was ensured in 4 countries including Croatia and Portugal

in January, and Germany and Turkey continued their level of efficiency in December. In February, there was a decrease again, and this count of countries decreased to 2 (Portugal and Turkey). In March 2021, the last month of the research period, the count of countries that ensured full efficiency reached the highest, and full efficiency was ensured in 9 countries consisting of Albania, Germany, Italy, Lithuania, Malta, Portugal, Romania, Slovenia, and Turkey. In addition, this period is the period when the highest average level of efficiency (0.917) was achieved during the relevant period when decreases and increases were encountered.

In Table 2, Bootstrap CCR scores are given. Because Bootstrap efficiency measurement contains a more accurate calculation, lower efficiency values were encountered compared to the original CCR measurement. According to this measurement, it is observed that no country that is the subject of the research for the relevant period reached the full level of efficiency. The highest level of efficiency during the corresponding period was in March 2021, and the lowest level of efficiency was in March 2020. Decreases and increases in Bootstrap CCR values throughout the process were detected. The highest efficiency value during the period was in March 2021 in Luxembourg. The highest efficiency values were recorded in Spain in March 2020 and January 2021; Luxembourg in April, June, July, and March 2021; Hungary in May; Lithuania in August; Estonia in September; France in October; Turkey in November and December; and Croatia in February.

Table 3 shows the original BCC values of the 24 countries in the analyses for March 2020-March 2021. According to the analysis results, the average efficiency value was 0.727 in the March 2021 period. According to BCC values, Albania and France achieved full efficiency during this period. In April, the number of countries which were able to reach the full level of efficiency increased to 6 (Albania, Croatia, France, Italy, Luxembourg, and Slovenia). The increase continued during the May period, and there was full efficiency in 9 countries (Albania, Croatia, Cyprus, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, and Malta). In June, there was a small decrease in the average efficiency level, and 8 countries including Albania, Estonia, Finland, Ireland, Latvia, Lithuania, Luxembourg, and Malta reached the full level of efficiency. Only Croatia, Latvia, and Luxembourg were found to achieve full efficiency during the July period, while the count of countries achieving efficiency decreased to 2 in August, and the efficiency in Latvia and Lithuania reached the level of 1,000. No country appears to have achieved full efficiency in terms of original BCC values in September and October. This situation has started to improve partially since Turkey reached full efficiency in November. In December, Turkey and Germany achieved full efficiency, and in January, Turkey and Germany, which continued the level of efficiency they reached, as well as Croatia, Portugal, and Spain, a total of 5 countries, achieved full efficiency. In February, there was a decrease again, and this number decreased to 2 (Portugal and Turkey). In March 2021, the last month of the research period, there was a significant efficiency increase of 16.5% compared to the previous month, the number of countries ensuring full efficiency reached the highest, and full efficiency was achieved in 10 countries including Albania, Germany, Italy, Lithuania, Luxembourg, Malta, Portugal, Romania, Slovenia, and Turkey. In addition, this period is the period when the average efficiency level (0.924) closest to the full efficiency level was reached during the research period in which the declines and rises were seen.

The Bootstrap BCC values are presented in Table 4. According to the Bootstrap BCC measurement, it seems that no country that is the subject of the research reached the full level of efficiency during the research period. The highest level of efficiency during the corresponding period was in March 2021, and the lowest level of efficiency was in March 2020. During the process, Bootstrap BCC values were detected to initially rise and then decline again. The highest efficiency value during the period was in August in Croatia, and the lowest level of efficiency was in March 2020 for Ireland.

**Table 3. Original BCC Efficiency Scores**

Country	ORIGINAL BCC												
	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER	JANUARY	FEBRUARY	MARCH
Albania	1.000	1.000	1.000	1.000	0.925	0.937	0.883	0.678	0.713	0.666	0.714	0.811	1.000
Austria	0.849	0.696	0.665	0.753	0.782	0.758	0.599	0.576	0.781	0.690	0.668	0.683	0.969
Bulgaria	0.679	0.721	0.781	0.779	0.805	0.807	0.739	0.728	0.856	0.838	0.720	0.689	0.975
Croatia	0.830	1.000	1.000	0.822	1.000	0.993	0.905	0.878	0.846	0.979	1.000	0.997	0.913
Cyprus	0.647	0.911	1.000	0.754	0.707	0.691	0.559	0.546	0.554	0.672	0.568	0.541	0.659
Denmark	0.584	0.740	0.658	0.622	0.635	0.615	0.716	0.697	0.709	0.851	0.738	0.702	0.822
Estonia	0.663	0.732	0.901	1.000	0.986	0.830	0.894	0.739	0.724	0.789	0.814	0.710	0.900
Finland	0.548	0.742	0.892	1.000	0.837	0.838	0.796	0.749	0.740	0.747	0.692	0.747	0.950
France	1.000	1.000	0.661	0.639	0.615	0.702	0.727	0.908	0.865	0.856	0.897	0.781	0.894
Germany	0.761	0.851	0.691	0.708	0.668	0.729	0.618	0.737	0.869	1.000	1.000	0.943	1.000
Greece	0.806	0.876	0.712	0.671	0.642	0.658	0.618	0.591	0.763	0.645	0.553	0.581	0.764
Hungary	0.644	0.805	1.000	0.730	0.622	0.636	0.734	0.608	0.805	0.767	0.643	0.635	0.984
Ireland	0.487	0.822	1.000	1.000	0.584	0.597	0.576	0.732	0.531	0.561	0.736	0.665	0.805
Italy	0.960	1.000	1.000	0.780	0.686	0.691	0.573	0.833	0.958	0.873	0.850	0.843	1.000
Latvia	0.717	0.738	1.000	1.000	1.000	1.000	0.777	0.667	0.644	0.673	0.705	0.718	0.755
Lithuania	0.620	0.771	1.000	1.000	0.968	1.000	0.729	0.628	0.664	0.807	0.768	0.749	1.000
Luxembourg	0.922	1.000	0.997	1.000	1.000	0.763	0.759	0.690	0.723	0.766	0.741	0.762	1.000
Malta	0.807	0.642	1.000	1.000	0.739	0.818	0.679	0.628	0.710	0.672	0.699	0.723	1.000
Portugal	0.578	0.615	0.563	0.661	0.617	0.606	0.568	0.621	0.702	0.615	1.000	1.000	1.000
Romania	0.493	0.640	0.664	0.708	0.783	0.768	0.682	0.661	0.766	0.757	0.892	0.831	1.000
Slovakia	0.555	0.953	0.760	0.858	0.917	0.941	0.578	0.636	0.633	0.689	0.691	0.763	0.978
Slovenia	0.802	1.000	0.857	0.847	0.867	0.693	0.576	0.604	0.624	0.749	0.885	0.817	1.000
Spain	0.969	0.842	0.862	0.536	0.542	0.651	0.653	0.788	0.694	0.639	1.000	0.817	0.807
Turkey	0.522	0.726	0.596	0.710	0.730	0.693	0.675	0.559	1.000	1.000	1.000	1.000	1.000
Mean	0.727	0.826	0.844	0.816	0.777	0.767	0.692	0.687	0.745	0.762	0.797	0.771	0.924

**Table 4. Bootstrap BCC Efficiency Scores**

Country	BOOTSTRAP BCC												
	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER	JANUARY	FEBRUARY	MARCH
Albania	0.851	0.818	0.861	0.813	0.838	0.854	0.772	0.621	0.646	0.613	0.651	0.739	0.828
Austria	0.789	0.646	0.609	0.713	0.749	0.712	0.566	0.557	0.737	0.649	0.621	0.638	0.844
Bulgaria	0.622	0.668	0.731	0.741	0.756	0.761	0.688	0.678	0.766	0.737	0.656	0.624	0.894
Croatia	0.763	0.817	0.816	0.762	0.911	0.945	0.837	0.821	0.797	0.878	0.827	0.889	0.803
Cyprus	0.585	0.812	0.875	0.653	0.649	0.627	0.527	0.518	0.531	0.634	0.542	0.521	0.641
Denmark	0.558	0.708	0.612	0.579	0.609	0.592	0.682	0.672	0.682	0.812	0.688	0.654	0.728
Estonia	0.606	0.655	0.793	0.810	0.880	0.756	0.832	0.702	0.692	0.749	0.768	0.676	0.826
Finland	0.502	0.698	0.811	0.880	0.756	0.783	0.761	0.722	0.718	0.719	0.667	0.722	0.873
France	0.813	0.819	0.628	0.599	0.574	0.670	0.686	0.836	0.808	0.800	0.836	0.740	0.799
Germany	0.721	0.795	0.641	0.659	0.636	0.690	0.577	0.708	0.775	0.816	0.815	0.816	0.819
Greece	0.700	0.779	0.648	0.621	0.619	0.636	0.594	0.570	0.712	0.608	0.534	0.559	0.737
Hungary	0.563	0.704	0.858	0.661	0.577	0.602	0.696	0.578	0.766	0.706	0.582	0.587	0.863
Ireland	0.446	0.738	0.826	0.858	0.553	0.575	0.559	0.685	0.512	0.545	0.685	0.629	0.736
Italy	0.840	0.857	0.849	0.682	0.633	0.661	0.538	0.766	0.849	0.786	0.755	0.747	0.817
Latvia	0.657	0.661	0.816	0.859	0.822	0.857	0.714	0.640	0.618	0.650	0.680	0.688	0.709
Lithuania	0.569	0.693	0.848	0.817	0.855	0.888	0.677	0.596	0.637	0.753	0.689	0.666	0.816
Luxembourg	0.851	0.843	0.870	0.839	0.874	0.694	0.680	0.657	0.665	0.687	0.680	0.701	0.822
Malta	0.737	0.576	0.863	0.829	0.680	0.760	0.644	0.583	0.661	0.638	0.660	0.668	0.813
Portugal	0.558	0.595	0.539	0.633	0.583	0.583	0.551	0.603	0.672	0.574	0.853	0.819	0.815
Romania	0.465	0.609	0.629	0.676	0.744	0.729	0.639	0.626	0.697	0.666	0.785	0.725	0.816
Slovakia	0.517	0.847	0.674	0.777	0.814	0.866	0.547	0.619	0.619	0.663	0.658	0.723	0.867
Slovenia	0.736	0.816	0.747	0.758	0.751	0.655	0.553	0.572	0.570	0.688	0.800	0.725	0.821
Spain	0.849	0.765	0.788	0.494	0.522	0.637	0.637	0.750	0.668	0.605	0.937	0.753	0.738
Turkey	0.487	0.699	0.563	0.675	0.684	0.659	0.633	0.519	0.933	0.866	0.817	0.875	0.817
Mean	0.658	0.734	0.746	0.724	0.711	0.716	0.650	0.650	0.697	0.702	0.716	0.704	0.802

**CONCLUSION**

Nowadays, it is discussed that the Covid-19 pandemic has come to an end. Considering two years ago, the main goal in all countries was to prevent and control the spread of the pandemic. On the other hand, the treatment of people infected with the disease and the supply and production of drugs and a vaccine or other methods that will provide this treatment have been intensively studied. On the other hand, the pandemic has been the main source of many problems, from economic downsizing to unemployment, from financial difficulties to trade contractions, to businesses stopping their activities. With the pandemic, the whole world has faced a crisis environment that is not limited to the health sector. Of course, states have resorted to the necessary struggle policies with the onset of the crisis. How effectively countries were able to perform against this shock they faced in the early period of Covid-19 Bootstrap efficiency analysis was carried out in 24 countries by focusing on the period of March 2020-March 2021, which is considered to be the first period of the pandemic. Average efficiency data showed that the full efficiency value was not reached in any country. The analysis revealed that the economic efficiency of the policies of countries against Covid-19 was not realized at the desired level. When today's technology and sophistication are taken into account, it is impossible to imagine that production will stop all over the world for even one day, but the world has experienced this situation. Thus, the result has now brought up concepts such as new economic models, different structural reforms, and system renewal. Now it is wondered how the years will be shaped after the pandemic. It is because the digitalization, social networks, distance education, homeworking, individual life, the future of globalization, and capitalism should be reassessed by examining the role of the government in the education and health sectors.

## REFERENCES

- [1] World Health Organization (WHO): WHO Guidelines for the Global Surveillance of Severe Acute Respiratory Syndrome (SARS), Department of Communicable Disease Surveillance and Response Updated Recommendations, (2004).
- [2] World Health Organization (WHO): Public Health Measures for Scaling up National Preparedness Middle East Respiratory Syndrome (MERS), (2018).
- [3] World Health Organization (WHO): Guidelines for the Management of Pregnant and Breast-Feeding Women in the Context of Ebola Virus Disease, World Health Organization, (2020).
- [4] World Health Organization (WHO), <https://www.who.int/emergencies/diseases/novel-coronavirus-2019/events-as-they-happen>.
- [5] Voyvoda, E., Yeldan, A. E., 2020. A General Equilibrium Analysis of the Impact of the COVID-19 Outbreak on Turkey's Economy and a Policy Alternative to Protect Labor Incomes. Political Economy Research Institute, Working Paper, No:518, pp. 1-12.
- [6] Altuner, A., Bozkurt, E. & Toktaş, Y. 2021. COVID-19 and Stock Markets: Deaths and Strict Policies, Intelligent Data Analysis for COVID-19 Pandemic, Springer.
- [7] Ergülen, A., Bolayır, B., Ünal, Z. & Harmankaya, İ. 2020. Covid-19 Sürecinde Türkiye'nin Etkinliğinin Veri Zarflama Analizi ile Değerlendirilmesi. Gümüşhane Üniversitesi Sosyal Bilimler Enstitüsü Elektronik Dergisi, 11(Ek), pp.275-286.
- [8] Selamzade, F., Özdemir, Y. 2020. COVID-19'a Karşı OECD Ülkelerinin Etkinliğinin VZA ile Değerlendirilmesi. Electronic Turkish Studies, 15(4), pp. 977-981.
- [9] Shirouyehzad, H., Jouzdani, J. & Khodadadi-Karimvand, M. (2020) Fight Against COVID-19: A Global Efficiency Evaluation based on Contagion Control and Medical Treatment. J. Appl. Res. Ind. Eng.,7(2), pp.109-120.
- [10] Aydın, N. & Yurdakul, G. 2020. Assessing Countries' Performances against COVID-19 via WSIDEA and Machine Learning Algorithms. Applied Soft Computing Journal, 97(2020) 106792, pp.1-18.
- [11] Eurostat, <https://ec.europa.eu/eurostat/web/products-datasets/-/teibs010> [Acc. 10 December 2021].
- [12] Hollingsworth, B. 2003. Non-Parametric and Parametric Applications Measuring Efficiency in Health Care. Health Care Management Science, 6(4), pp. 203-218.
- [13] Banker, R. D., Charnes, A., & Cooper, W. W. 1984. Some Models for Estimating Technical and Scale Inefficiencies in Data Envelopment Analysis. Management Science, 30(9), pp. 1078-1092.
- [14] Ramanathan, R., 2003. An Introduction to Data Envelopment Analysis: A Tool for Performance Measurement. Sage Publications, New Delhi.
- [15] Yun, Yeboon B., Nakayama, H., Tanino, T., 2004. Continuous Optimization A Generalized Model for Data Envelopment Analysis. European Journal of Operational Research, 157, pp. 87-105.
- [16] Efron, B. 1979. Computers and the Theory of Statistics: Thinking the Unthinkable. SIAM Review, 21(4), pp. 460-480.
- [17] Efron, B., Tibshirani, R. J. 1994. An Introduction to the Bootstrap, CRC Press.
- [18] Smeekes, S., 2009. Bootstrapping Nonstationary Time Series. Universitaire Pers Maastricht.
- [19] Ferrier, G. D., Hirschberg, J. G. 1997. Bootstrapping Confidence Intervals for Linear Programming Efficiency Scores: With an Illustration Using Italian Banking Data. Journal of Productivity Analysis, 8(1), pp. 19-33.
- [20] Simar, L., Wilson, P., 1998. Sensitivity Analysis of Efficiency Scores: How to Bootstrap in Nonparametric Frontier Models. Management Science, 44(1), pp. 49-61.
- [21] Simar, L., Wilson, P., 1999. Estimating and Bootstrapping Malmquist Indices, European Journal of Operational Research, 115 (3), pp. 459-471.
- [22] Simar, L., Wilson, P., 2000a. A General Methodology for Bootstrapping in Nonparametric Frontier Models. Journal of Applied Statistics, 27 (6), pp. 779-802.
- [23] Simar, L., Wilson, P., 2000b. Statistical Inference in Nonparametric Frontier Models: The State of The Art. Journal of Productivity Analysis, 13 (1), pp. 49-78.
- [24] Simar, L., & Wilson, P. W. 2008. Statistical inference in nonparametric frontier models: recent developments and perspectives. The measurement of productive efficiency and productivity growth, 421-521.
- [25] The Humanitarian Data Exchange, <https://data.humdata.org/> [Acc. 10 December 2021].

### Article history:

Received 12 April 2023

Accepted 10 December 2023

**PART IV**  
**TOURISM, TRADE AND PRODUCTION**



# IMPACT OF THE EVENT ON THE SUSTAINABILITY OF THE TOURIST DESTINATION - PERCEPTION AND ATTITUDES OF THE LOCAL POPULATION

RUDANČIĆ, Andreja<sup>1</sup> GUZOVSKI, Marina<sup>2</sup> SMOLJIĆ, Mirko<sup>3</sup>

<sup>1,2</sup>Libertas International University, Zagreb (CROATIA)

<sup>3</sup>University North, Varaždin (CROATIA)

E-mails: [arudancic@libertas.hr](mailto:arudancic@libertas.hr), [mguzovski@libertas.hr](mailto:mguzovski@libertas.hr), [msmoljic@unin.hr](mailto:msmoljic@unin.hr)

## ABSTRACT

*The issue of sustainability is at the centre of international concern with pressure on both commercial operators of all sizes and from all sectors, as well as private citizens to adapt their daily lives to reduce negative impacts on the environment. Tourism and its contribution to climate change are increasingly the focus of discussions. More specifically, the events sector has attracted attention and there is now a growing international debate on how to encourage event organizations to become more environmentally sustainable. The aim of this paper is to examine the perception and attitudes of the local population of the tourist destination Split on the holding of the Ultra Europe event. Empirical research is focused on examining the personal attitudes and reflections of the resident population by holding events on the sustainability of their destination. The general conclusion of the research is that the local population resents organized events, which causes negative phenomena such as saturation of the space by exceeding the reception potential, pollution of the environment with various municipal waste as well as noise in the space, which disrupts the natural harmony of the destination as well as its sustainability. Based on the results of the research, certain conclusions and reflections were projected that could be of importance to interested subjects in understanding both encouraging and warning situations.*

**Keywords:** *tourist events, sustainability of the destination, local population, destination Split*

**JEL:** Z32

**DOI:** 10.5937/intrev2304201R

**UDC:** 338.485:39(497.5)

338.481.2

**COBISS.SR-ID** 133934601

## INTRODUCTION

Events are an important component of the tourism segment as they offer valuable economic, social, cultural and educational benefits and potential tourism growth for many international destinations. Events by their very nature create waste. However, properly managed events can recycle excess materials and supplies in useful and meaningful ways, and can do so using methods that result in minimal environmental impacts. It is an increasingly common practice in the industry to carry out an Environmental Impact Assessment (EIA) [1] as part of the planning process for any event, and the importance and need for this have recently become more significant not only from the perspective of environmental protection, but also from the corporate social perspective of responsibility, and from the perspective of marketing and public relations [2]. Authors Ek, Hornskov and Mansfeldt point out that until recently, environmental impact assessments were the only means by which event organizers could assess the degree of impact their event would have on the environment. The events sector has experienced phenomenal growth over the past decade in terms of the number, variety and popularity of events on offer [3]. As the number of events increases, there is also a growing realization that there is a need for event management professionals who are capable of creating, organizing and managing events. In their work, Wong, Wu and Cheng emphasize that although many events are successfully managed by dedicated volunteers, increasing competition in all event sectors is driving the need for more fully professionalized events with well-educated staff, managed by an experienced professional event manager [4]. As such, professional associations play a significant role in facilitating the education and advancement of event management professionals working in the field. Events usually involve a significant number of visitors in a limited geographical space in a relatively short period of time, since maximizing the number of visitors is often equated with a high degree of success from an economic perspective. This congestion leads to the possibility of environmental degradation of the host destination. The authors Salimova, Vukovic, Guskova [5] point out that it is important to make cities and human settlements inclusive, safe, resilient and sustainable, thus it can be concluded that those cities that host various events should also think about sustainable events that are held in their area. In this regard, the long-term success of destination tourism, such as festivals, depends not only on maximizing economic benefits, but also on protecting the natural environment in which tourist experiences take place. Pollution resulting from tourist events is proportional to the number of visitors (tourists), which is logical, but not a rule. Namely, several thousand visitors to a classical music concert in the Pula Arena are more ecologically neutral compared to the participants of a rock concert in Šijanska šuma (noise, fireworks, waste, engine exhaust...). Therefore, the marketing of these two events should be designed to promote the destination as sustainable through raising awareness and responsible behaviour in preserving the cultural values as well as the natural assets of the destination.

## THEORETICAL BASIS AND LITERATURE REVIEW

Events affect all spheres of human activity, from economic, social, cultural and political. Draper, Dawson and Casey point out that the reason for the greater popularity of events lies precisely in the series of positive effects they have on the environment and society, which arouses the interests of tourist destinations, but also the state (Ministry of Tourism, economic and guild associations) for more active involvement in the event industry. However, it should be emphasized that some events can (accidentally or intentionally) cause negative effects, which can then cause negative publicity through the media [6]. According to the authors Thaichon and Quach, overemphasized criticism of a soft tourism event can have unforeseeable consequences, which suggests a careful selection of the event or at least corrections through public relations (PR) [7]. Every event has an immediate impact on the participants of the event, the tourist destination, but also on the wider community, especially when it comes to sports events or large concerts. It is a specific type of event when celebrating national holidays or religious holidays. However, regardless of the type and purpose, it can be concluded that visiting or participating in events enables interaction with interesting people and ideas. The desired and unwanted effects that can result from an event can be compared in a tabular form.

*Table 1. Desired and unwanted effects of the event*

AREA OF INFLUENCE	DESIRED EFFECTS	ADVERSE EFFECTS
<b>Social and cultural</b>	Sharing a common experience	Community alienation
	Revitalization of tradition	Manipulation of the community
	Active participation of the community	Negative image of the community
	Social group acceptance	Bad group behaviour
	Presentation of new challenges and ideas	Various abuses together
	Expanding cultural perspectives	Loss of politeness
<b>Social and physical impact on the environment</b>	Promotion of the environment	Damage and pollution of the environment
	Increasing awareness of the environment	Destruction of cultural heritage
	Infrastructure development	Noise
	Improvement of transport and communications	Traffic jams
	Urban transformation and renewal	Lack of social control
<b>Political influence</b>	International reputation	The risk of the event being unsuccessful
	Improving appearance	Poor allocation of funds
	Investment promotion	Lack of jurisdiction
	Social unity	Anti-propaganda
	Development of management skills	Lack of social responsibility
<b>Tourism and economy</b>	Destination promotion	Community resistance to tourism
	Increasing the length of stay of tourists	Lack of authenticity
	Increased income	Declining reputation
	Increased residence tax	Exploitation
	Numerous business opportunities	Unreal price growth
	Commercial activities	Unexpected expenses
	New workplaces	Financial loss

*Source: Bowdin G., McDonnell I., Allen J., O'Toole W.: Events Management, 2006, str. 38.*

In general, it can be considered that the effects of the event are positive for the tourist destination, which includes tourist catering activities, but also other related services. Bowdin, McDonnell, Allen and O'Toole [8] list the following benefits that the local community has from the event:

- Communities were mobilized and involved.
- High level of integration in the community.
- Organizers and volunteers have developed significantly.
- A large number of volunteers were involved, providing significant amounts of creative, educational and recreational opportunities.
- It attracted a large group of people who came and participated.
- The vast majority of them reported strengthening ties in the local community and an increased sense of pride.
- It provided entertainment in a warm atmosphere.
- It is likely that the event will take place in some form in the future.

The nomenclature of events includes mega, special, social, major and local events. Events are categorized based on their size, scope and scale. Moreover, according to Jaimangal-Jones, Fry and

Haven-Tang, events can be categorized according to their type or sector, e.g. as conferences and exhibitions, arts and entertainment, sporting events and charity events [9]. An event often consists of several different but related functions. The events are explicitly related to the basics of a human being - social and cultural values, and basic scales of social inclusion, sense of belonging and sense of identity [10]. It is clear that organizing an event creates large impacts, supporting the view that organizing and managing a planned event involves many components and many stakeholders. Often, decisions about the organization and hosting of events are made from different viewpoints of stakeholders. Mair and Jago concluded that a good economic rationale is a strong indicator in combination with the social and cultural benefits of the destination, raising awareness of social issues and improving the exchange of ideas, networking and business contacts [11]. Often overlooked and often ambiguous are the social elements of the three pillars of sustainability. The scope of any framework should include those who work, participate and attend the event, consider social inclusion as a key principle for widening participation and encourage interest from all aspects of the surrounding community. Social inclusion within the event should include: [12]

- awareness of the needs of the groups participating in the event;
- creating a structured policy statement to ensure equality and equity for all; and
- introduction to work and training of all staff and volunteers in awareness, recognition and self-management of equality and equity for all.

Authors Wee, Mustapha and Anas point out in their research that sustainable event management has evolved over a number of years, and the conceptual framework that has developed and emerged from event planning and management over the past decade is necessary for a responsible event profession operating in the 21st century, at why sustainable event management is a problem for every generation and requires changes through successive generations through: [13]

- change of attitude;
- increasing pressure in the supply chain;
- increasing awareness of the true cost of waste; and
- transparency of the product life cycle.

According to Stern, each generation must take up the challenge anew, determining in which direction their development goals lie, what constitutes the limits of the ecologically possible and ecologically desirable, and what their understanding of social inequality is. Creating a framework or set of principles that can be adapted to changes in market demands is essential for successful implementation within the events industry [14]. Therefore, Hung, Ching, and Wien conclude in their work that a major challenge to achieving sustainable management practices is the constant stress on the physical and ecological environment as the number of participants in events and festivals is constantly increasing [15]. There are requirements to develop a framework that would suit the internal and external environment of the event. A sustainable event management framework should enable mitigating the effects of hosting expensive, resource-based events and include achievable improvements in the "three-pillar effect" [4]. Preparation in planning is the most important for the successful implementation and evaluation of any management plan. Kostopoulou implies that the nature of the events industry is such that time constraints, contractual relationships, tight margins and continuous pressure to create unique experiences are second nature [16]. Any existing and/or new activity must consider the source of the material and the materials used in the light of life cycle analysis. If materials are to be used, they must be reused, recycled or recycled. Consequently, the authors Ziyadin, Koryagina and Grigoryan suggest that supply chain management and procurement negotiations are fundamental elements of aligning sustainability principles and event organization logistics [17]. Stange and Brown point out that in terms of sustainable event management, improved goals should be set, innovative practices implemented and new technologies consulted [18]. It should also provide a holistic view of all event activities in an industry traditionally considered material and resource consuming. Even so, simple actions such as event tickets, authors Argon-Correa, Martin-Tapia and Torre-Ruiz point out, delegation packages and contractual communications can be distributed electronically or produced using recycled materials that can be reused [19].

EVENT		
SOCIETY	ENVIRONMENT	ECONOMY
<i>Positively</i>		
Induced development and construction costs Long-term promotional benefits Civic pride Community development Increased employment opportunities	Raising awareness of environmental issues Development of waste management Long-term preservation of the area	Direct/indirect expenses Increased property value due to regeneration Additional development of trade and business Induced development and construction costs Event Product Extensions
<i>Negative</i>		
The future use of the infrastructure is not maximized Interruption of normal business exodus of residents A lifestyle disorder Influences on the media Community apathy and antagonism Increased risk of security issues Unequal distribution of wealth	Damage to place/location – short-term and long-term Waste and pollution Noise pollution Traffic jam and traffic jam Increasing needs for energy and other natural resources	The cost of event failure to the local/national economy Inflated prices of products, services and benefits Unequal distribution of wealth

**Figure 1.** Impacts of the "three pillars" of the event

Source: processing by the author according to Raj, R., Musgrave, J. (2009). *Event Management and Sustainability*, Leeds Metropolitan University. pp.5

Sustainable principles must provide social, political and economic purpose for the introduction of sustainable systems. Awareness of the demands on the ecological and social systems within which each event operates is a fundamental principle. An analysis of the resources used, the method of sourcing and supply, must also be adopted to ensure compliance; where this is not defined in the destination, actions and steps should be taken. Absolute policy and processes must be designed and applied through all components and all phases of each event [12].

**RESEARCH METHODOLOGY**

The research was conducted in the period from November 1 to December 31, 2022 in order to obtain the highest possible response from respondents. In order to achieve the credibility of the sample, an effort was made to ensure the appropriate proportion of respondents, i.e. the local population of the city of Split, Republic of Croatia, on a randomly selected sample of respondents. The survey was voluntary and anonymous. The research was conducted through personal interviews and through Google Forms. The survey questionnaire was sent to 130 e-mail addresses, and 98 correctly filled forms were returned. The response rate is 75%. The survey questionnaire consisted of demographic questions related to gender, age, education and the statement of attitude towards certain statements in which the respondents expressed their level of agreement/disagreement with the stated statement, where 1 - I do not agree at all, and 5 - I completely agree with the above statement. The results of the research carried out by means of a survey questionnaire are presented in the continuation of the paper, and they refer to the research questions: What is the attitude of the resident population towards the holding of the Ultra Europe festival event? Does hosting an event affect the sustainability of their destination?

**RESEARCH RESULTS**

98 respondents (residents of the city of Split) participated in the research, of which the most respondents were aged 36 to 45 (25%), followed by respondents aged 26 to 35 (22%), and 46 to 55

(18%). There were also respondents between the age of 16 and 25 (16%), from 56 to 65 years of age (14%) and the rest of respondents were aged 65 and over (5%). According to the education of the respondents, 33% have a university education, 26% have completed high school, 21% have a master's degree, 8% have a doctorate, and 12% have other forms of education. In expressing their views, 46.94% of the respondents are of the opinion that the holding of this event has improved the standard of the population, although 30.61% of them are of the opinion that due to the event itself, prices also rise, and that the event itself affects the increase in garbage on the streets (54.08%), increase in noise (54.08%), traffic congestion and lack of parking spaces (41.84%), and that the event affects the natural and cultural heritage with an increased number of visitors (61,225). The majority of respondents (61.23%) believe that the event itself did not affect the growth of crime and that their safety was questioned (61.23%). The structure of the answers is shown in Table 2.

*Table 2. Expression of respondents' attitudes according to the stated claims*

Claim	1 - I do not agree at all	2 - I mostly disagree	3 - I neither agree nor disagree	4 - mostly agree	5 - I completely agree
The holding of the event so far has significantly improved the standard of the population	15,31%	12,24%	25,51%	19,39%	27,55%
The safety of the population was put into question by the holding of the event	15,31%	16,33%	29,59%	23,47%	15,31%
Due to the holding of the event, prices are rising, which is causing resentment among the population	22,45%	24,49%	22,45%	18,37%	12,24%
The holding of the event caused the appearance of large amounts of garbage on the streets	14,29%	15,31%	16,33%	21,43%	32,65%
Holding the event had an impact on the growth of organized crime	14,29%	23,47%	23,47%	17,35%	21,43%
The destination is experiencing a significant increase in noise as a result of holding the event	13,27%	12,24%	20,41%	22,45%	31,63%
Holding events leads to traffic congestion and lack of parking spaces	21,43%	15,31%	21,43%	19,39%	22,45%
Holding the event has delayed the appearance and arrangement of the place	15,31%	17,35%	27,55%	21,43%	18,37%
The holding of the event directly damages the natural and cultural heritage by excessive event visitors	11,22%	9,18%	18,37%	32,65%	28,57%

*Source: author's research*

Based on the conducted research, and following the research questions that related to the attitude of the resident population towards holding the Ultra Europe festival and its impact on the sustainability of the destination, the results show that the resident population, on the one hand, has a positive attitude towards the event, considering that holding the event itself improves the standard itself of the destination's resident population, and on the other hand, they emphasize dissatisfaction with crowds, noise, environmental pollution and the natural harmony of the destination, as well as its sustainability, given that Split is under the protection of UNESCO.

## CONCLUSION

Holding the Ultra Europe festival in Split as a traditional event (since this year will be held for the ninth time in a row), like every event, has its own positive and negative effects on the destination where it is held. The aim of this work was to determine the attitudes of the local population towards holding the event itself as well as the sustainability of the destination. The interviewees pointed out that the event itself affects the increase in prices, but also the improvement of the standard of living due to the involvement in the accompanying contents and the organization of the festival itself. The holding of the festival positioned Split as a tourist destination in the global environment and gave an additional value to the offer of Split itself. A large number of visitors also results in some negative effects of holding the event itself, which the respondents pointed out in this research, such as: increased crowds, noise, larger amounts of garbage, concern for cultural heritage and natural values, etc., which affects their dissatisfaction with the holding of the event itself. In order to satisfy the interests of all stakeholders, a holistic approach and intensification of marketing activities on education, awareness-raising and responsible behaviour of festival visitors in a city protected by UNESCO with an emphasis on respect for the destination and local residents, and for the purpose of preserving the natural harmony of the destination and sustainability. When interpreting the research, the limitations of the conducted research should be taken into account, considering that the research was conducted on a random sample of 98 respondents who voluntarily wanted to fill out the survey questionnaire. Descriptive statistics were used in the paper. As an additional limitation, the authors point out that the research was conducted once. Therefore, the authors suggest that it would be better to conduct research in more and longer time series in order to be able to correlate certain changes that would additionally examine the impact of the held event on the social influence of the respondents. This research can be the basis for future repeated research after the intensification of marketing activities with the application of appropriate variables and appropriate statistical methods.

## REFERENCES

- [1] Publications Office of the European Union. (2021). 35 years of EU Environmental Impact Assessment Luxembourg. pp.1-10.
- [2] Arcodia, C., & Dickson, C. (2009). Promoting sustainable event practice: The role of professional associations. *Events and Meetings in the City School of Business, Economics and Law, School of Business, Economics and Law, Göteborg, Sweden: Centre for Tourism*. pp. 92-106.
- [3] Ek, R., Larsen, J., Hornskov, S. B., & Mansfeldt, O. K. (2008). A Dynamic Framework of Tourist Experiences: Space-Time and Performances in the Experience Economy. *Scandinavian Journal of Hospitality and Tourism*, 8(2). doi: <http://www.tandfonline.com/action/showCitFormats?doi=10.1080/15022250802110091>, pp.122-140.
- [4] Wong, J., Wu, H. C., & Cheng, C., C. (2015). An empirical analysis of synthesizing the effects of festival quality, emotion, festival image and festival satisfaction on festival loyalty: A case study of Macau Food Festival. *International Journal of Tourism Research*, 17(6), pp.521–536.
- [5] Salimova, T., Vukovic N., Guskova N. (2020). Towards sustainability through industry 4.0 and society 5.0. *International Review*, No.3-4/2020, Faculty of Business Economics and Entrepreneurship Beograd, pp. 48-54.
- [6] Draper, J., Dawson, M. and Casey, E. (2011), “An exploratory study of the importance of sustainable practices in the meeting and convention site selection process”, *Journal of Convention & Event Tourism*, Vol. 12 No. 3, pp. 153-178.
- [7] Thaichon, P., & Quach, T., N. (2016). Integrated marketing communications and their effects on customer switching intention. *Journal of Relationship Marketing*, 15(1/2), pp.1–16.
- [8] Bowdin, G., McDonnell, I., Allen, J., & O’Toole, W. (2006). *Events Management (2nd Edition izd.)*, London: Routledge. doi: <https://doi.org/10.4324/9780080457154>
- [9] Jaimangal-Jones, D., Fry, J., & Haven-Tang, C. (2017). Exploring industry priorities regarding customer satisfaction and implications for event evaluation. *International Journal of Event and Festival Management*, 9(1), DOI: 10.1108/IJEFM-06-2016-0044. pp.51-66.
- [10] Perić, M., Vitezić, V., & Mekinc, J. (2019). Comparing business models for event sport tourism: case studies in Italy and Slovenia. *Event Management*, 23(1), DOI: <https://doi.org/10.3727/152599518X15403853721466>. pp.379-397.

- [11] Mair, J. i Jago, L. (2010.) The Development of a Conceptual Model of Greening in the Business Events Tourism Sector. *Journal of Sustainable Tourism*, 18, <https://doi.org/10.1080/0966958090329100>. pp.77-94.
- [12] Raj, R., Musgrave, J. (2009). *Event Management and Sustainability*, Leeds Metropolitan University.
- [13] Wee, H., Mustapha, N., A. & Anas, M., S. (2021). Characteristic of Green Event Practices in MICE Tourism: A Systematic Literature Review. *International Journal of Academic Research in Business and Social Sciences*, 11(16). pp.271–291.
- [14] Stern, P., C. (2000). New environmental theories: Toward a coherent theory of environmentally significant behavior. *Journal of Social Issues*, 56(3). pp.407–424.
- [15] Hung-Che W., Ching-Chan C., & Wien H. (2017). An empirical analysis of green convention attendees' switching intentions, *Journal of Convention & Event Tourism*, DOI:10.1080/15470148.2017.1296393. pp.1-33.
- [16] Kostopoulou, S. (2013). On the Revitalized Waterfront: Creative Milieu for Creative Tourism. *Sustainability* 2013, 5. doi: 10.3390/su5114578. pp. 4578-4593.
- [17] Ziyadin, S., Koryagina, E., & Grigoryan, T. (2019). Specificity of using information technologies in the digital transformation of event tourism. *International Journal of Civil Engineering and Technology (IJCIET)*, 10(1). <http://www.iaeme.com/ijciet/issues.asp?JType=IJCIET&VType=10&IType=01>. pp.998-1010.
- [18] Stange, J., & Brown, D. (2011). *Tourism Destination Management. Achieving Sustainable and Competitive Results. Sustainable Tourism: International Cooperation for Development. US Agency for International Development -Online tool kit and resource series.* <http://lms.rmportal.net/course/category.php?id=51>. pp.1-142.
- [19] Aragon-Correa, J.A., Martin-Tapia, I. & de la Torre-Ruiz, J. (2015). “Sustainability issues and hospitality and tourism firms’ strategies: analytical review and future directions”, *International Journal of Contemporary Hospitality Management*, Vol. 27 No. 3. pp. 498-522.

**Article history:**

Received 18 April

Accepted 28 October

# ANALYSIS AND PREDICTION OF TOURIST TRAFFIC IN THE REPUBLIC OF SERBIA AFTER THE PANDEMIC

**GAJIĆ Tamara<sup>1</sup>, ZRNIĆ Miloš<sup>2</sup>, VUKOLIĆ Dragan<sup>3</sup>**

<sup>1</sup>Geographical Institute "Jovan Cvijić" SASA, South Ural State University, Institute of Sports, Tourism and Service, Chelyabinsk (RUSSIA). Faculty of Hotel and Tourism Management, University of Kragujevac, Vrnjačka Banja (SERBIA)

<sup>2</sup>Academy of Applied Studies – The College of Hotel Management, Belgrade (SERBIA)

<sup>3</sup>Faculty of Hotel management and Tourism, University of Kragujevac, Vrnjačka Banja, (SERBIA). Faculty of Tourism and Hotel Management, University of Business studies 78000 Banja Luka, (BOSNIA AND HERZEGOVINA).

E-mails: tamara.gajic.1977@gmail.com, milos.zrnic@vhs.edu.rs, vukolicd@yahoo.com

## ABSTRACT

*In the last two and a half years, the COVID-19 pandemic has caused great losses both in society and in the field of economy and all its sectors. The goal of the research was to try to predict the tourist traffic for the period of the next two years, based on the data of the Statistical Office of the Republic of Serbia. Time series analyse (TSA) was used, and based on the obtained data that indicate the reliability of the model, a forecast was made. The importance of the research is seen first of all to supplement the theoretical part of the research of tourist traffic in the future after unforeseen crisis situations, but also in an applied sense, where tourist subjects could look at the results of predictions and control their business as much as possible in the future period.*

**Keywords:** *tourism, forecasting, TSA, pandemic, Serbia.*

**JEL:** C22, L83

**DOI:** 10.5937/intrev2304209G

**UDC:** 338.482:311(497.11)"2002/2022"

**COBISS.SR-ID** 133936393

## INTRODUCTION

The period marked by the attack of an invisible enemy or the COVID-19 pandemic will be remembered for the large number of human victims, but also for the great damage suffered by the world economy [1][2] [3] [4]. In this context, it is understood that tourism, as a sector of the economy, experienced a major collapse after intensive growth [5]. The question arises of the possibility of forecasting the development of tourism in the coming period, because it is uncertain whether the pandemic will return again or whether it has completely disappeared [6][7]. Tourism was completely destroyed, but in that period it switched to sustainable forms of tourism [3]. Similar research indicates that the most significant negative impacts are the closure of businesses operating in cultural tourism and related sectors, the cancellation of major events and the establishment of travel restrictions. There are numerous studies related to the topic of forecasting the number of tourists, and almost every one of these studies positively predicts the future growth of tourist traffic.

The specific goal of this study was to predict the number of tourists using time series analysis expert modeler, which, apart from its popularity, has extremely good natural statistical characteristics because it includes both ARIMA and exponential smoothing models. Available data from the Republic Institute of Statistics for the period from January 2012 to September 2022 were used, and a forecast was made for the next two years. The obtained data indicate the possibility of a quick recovery of tourism, but certainly not at the same value that tourism had before the pandemic.

It can be said that there are scientific research manuscripts on the topic of the impact of the pandemic on tourism, but there are only a small number of those dealing with predicting the future of tourism restoration. The obtained data can serve as a key source of information for understanding the current position of tourism after major losses, which would be useful for all tourism entities, but also to complement the development of the theory about the negative impact on tourism and tourism. When it comes to limiting circumstances, it can be said that the key problem lies in the uncertainty of the return of the pandemic and the sharp decline of tourism again. The statistics are accurate, but the limits of possible errors must be taken into account when making predictions.

## LITERATURE REVIEW

The fact that tourism is a sector that can shut down overnight was proven during the COVID-19 pandemic [8][9]. All economic branches experienced a great decline, and in that hermetic circle in which the tourist activity is included, the loss spilled over from one branch to another [10][11]. According to UNWTO data, international tourist arrivals in 2021 are 75 % below the level of 2019 [12]. For a long time, government-mandated security measures were in place. Some of them related to border closure measures and the impossibility of leaving the country. That period saw a drop in international arrivals of more than a billion compared to the years before COVID-19 emerged. Such an average of international arrivals was recorded in the early 1980s [12]. The years before the pandemic are significant due to the fact that the global tourism sector has been experiencing continuous growth for decades. If you look at the UNWTO data, it can be seen that the number of tourists since 1980 has increased from 277 million to 1.5 billion in 2019. During the period from January to September 2022, international tourism has increased by 182% compared to 2021 year, but it is still 60% less than in 2019 [13,12]. UNWTO predicts an increase in international arrivals in the next year in the amount of 55 to 70% compared to the period when the pandemic began in 2019 [14][15]. A sudden and constant growth of this activity can be observed until the beginning of the pandemic and a sudden decline. It is known that during the period of recent crises such as the SARS pandemic (2003), the world economic crisis (2007), tourism declined, but not to the same extent as with the emergence of COVID-19. After the crises that occurred in 2003 and 2007, tourism had a recorded growth, while it experienced a sudden and unprecedented decline due to the emergence of COVID-19 [12]. That period was marked by border closure measures, travel restrictions or bans, as well as restrictions on staying in closed facilities, and sometimes even closing facilities. The pandemic is the cause of negative financial results in the world, but also a health crisis [16][17] and the pandemic also affected the creation of movement and increased migration [18]. Some countries are still under the influence of the negative image of the pandemic, and people still do not want to travel to those countries, even though all security measures have been lifted [19][1]. There are studies that indicate that the Chinese people have unjustifiably suffered shame

because they are from the country where the pandemic started in 2019 in the city of Wuhan, and they have been unfairly marginalized in the places they travel to [20][21]. Every type of crisis, whether it is a pandemic, a weather disaster or war conflicts, has negative consequences on tourism, on the psychological state of tourists and on the decision to travel to countries that have been or are still affected by the risk of infection [22][23]. Many tourists gave up their trip during the pandemic, even in countries that relaxed security measures and started accepting tourists [24][2]. It is clear that every form of travel and staying indoors and close encounters with a large number of tourists increases the possibility of contracting the Corona virus [25][7].

In Serbia, tourism has always been an underdeveloped economic branch [3][26]. The pandemic worsened the state of tourism and brought it to the worst position so far in the history of the development of tourism in this area [1]. It has always been known that tourism is a tertiary activity, but it promotes the development of the entire economy and all its complementary activities [13][27]. The shutdown of tourism by a fatal pandemic damaged the economic sector, but a large number of people also lost their jobs [28]. The tourism and leisure industry has experienced the heaviest impacts of tourism from COVID-19, and is one of the most threatened industries worldwide [29]. Foreign and domestic tourism saw a steeper decline, causing losses of \$2.86 trillion in this crisis period [30]. However, the last two years have marked a shift towards rural destinations and closer to the place of residence [3]. The new trend towards rural and ecological areas is still growing today [31].

Some authors believe that the smoothing model as a way of forecasting tourism is outdated, but they suggest the use of econometric and judgment methods [29]. The time series model is used in many researches in the field of tourism [31][32][33]. Song et al. (2003b) [34] used statistical approaches, such as time series, econometrics and artificial intelligence, to forecast tourist demand. However, some authors use Delphi surveys to forecast the number of tourists, because they believe that the judgment model improved the accuracy of forecasts compared to individual statistical forecasts [35][36]. Alessi et al. (2014) [37] used a time series model to predict macroeconomic variables such as GDP growth, unemployment and inflation. Given that tourism was a dynamic activity that faced great competition and great challenges before the pandemic, tourism entities should be guided by forecasting methods in order to align their business policy with changes [38,34,39]. Also, the planners and creators of the tourism economy use the forecasting model as one of the effective ways to get the necessary information about the market conditions, in order to follow the changes and influence the future positive business [40].

Creation of plans for efficient and effective marketing and preservation on the market, and for formulation tourism policy, it is necessary to monitor the factors and forecast results [41]. Government organizations and tourism companies use the results of tourism demand forecasting to plan ahead and efficiently allocate their resources [32]. Also, governments require accurate methods of forecasting, and make decisions in an informed manner, regarding the development of tourist infrastructure and accommodation planning [42]. Organizations need forecasts to make tactical decisions regarding tourism promotional activities [43][44]. Many authors use forecasting methods such as: econometric methods like autoregressive distributed lag model (ADLM), time-varying parameter models (TVP), Bayesian statistical models, state-of-the-art tourism forecasting methods using artificial intelligence (AI) models, applications of AI models and hybrid models that combine AI and statistical techniques [45][46]. Based on the available literature related to the main objective of the research, hypotheses were set:

*H1a: Tourist traffic in the next two years will reach the values it had before the pandemic.*

*H1b: Tourist traffic in the next two years will have a sharp recovery and surpass the values it had before the pandemic.*

*H1c: Tourist traffic will continue its stagnation, which it fell into during the pandemic (end of 2019, 2020, 2021).*

## METHODOLOGY

All values were obtained using SPSS version 26.00 software. The method used method used in time series analysis (TSA) was Expert Modeler. Time series forecasts are based on an analysis of past data or a set of historical data. The assumption is that such statistics can be used for future predictions [47]. The time period between two adjacent time series points depends on the application and can be: second, day, week, month or year In this study, predictions were made only for the next two periods year, given that the situation with the epidemic is still uncertain. In some countries, the scenario of the previous two

and a half years is being repeated [48]. Time Series Analysis (TSA) [49] finds hidden patterns and derives useful insights from time series data. TSA is useful in predicting future values or detecting anomalies in various application areas. Because weather forecasting is complex and because each forecasting method can only work with certain forecasting cases, expert modeler was found to be the most appropriate, as it combines both exponential smoothing and an ARIMA model.

Table 1 gives an insight into the achieved values of tourist traffic in Serbia for the period from 2002 to 2022, which were used for prediction.

Year	Tourists
01-Jan-2002	2.129.000
01-Jan-2003	1.997.947
01-Jan-2004	1.971.683
01-Jan-2005	1.998.469
01-Jan-2006	2.006.488
01-Jan-2007	2.306.558
01-Jan-2008	2.266.166
01-Jan-2009	2.021.166
01-Jan-2010	2.000.597
01-Jan-2011	2.068.610
01-Jan-2012	2.079.643
01-Jan-2013	2.192.435
01-Jan-2014	2.192.268
01-Jan-2015	2.260.243
01-Jan-2016	2.753.591
01-Jan-2017	3.085.866
01-Jan-2018	3.430.522
01-Jan-2019	3.689.983
01-Jan-2020	1.820.021
01-Jan-2021	2.591.293
01-Sep-2022	2.897.941

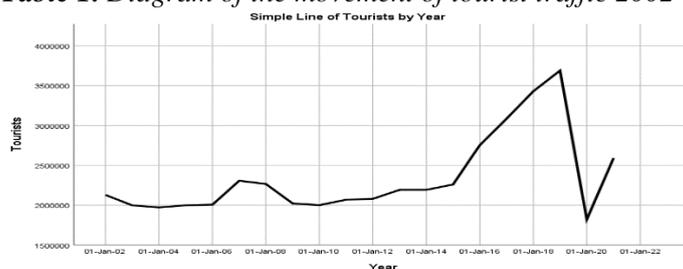
Source: Statistical Office of the Republic of Serbia, 2002-2022

Given that many authors point out that forecasting using time series indicates that the phenomenon under investigation continues to behave similarly to the recent past, this study tried to determine how tourist traffic will behave in the next two years considering the crisis situation. Due to this fact, unexpected results can be reached, so that data from the past are of less importance for predicting the future.

## RESULTS AND DISCUSSION

The goal of the research was to provide empirical evidence that it is possible to predict tourist traffic in the following period, and to prove the initial hypotheses and the research question. Prediction weights decrease exponentially over time, as the most recent data are taken into account, which are sometimes much more influential on future forecasts than observations based on older existing data. Table 1 shows the basic representation or diagram of tourist traffic for the previous 20 years.

**Table 1.** Diagram of the movement of tourist traffic 2002-2022.



Source: authors research

The basic parameters of fitting the expert modeler model are given in Table 2. The statistical significance of fitting the data with the basic model is observed.

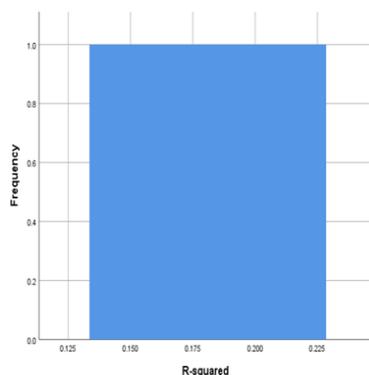
**Table 2. Expert modeler fitting parameters**

Estimate	SE	t	Sig.
0.460	0.199	2.306	0.033
R <sup>2</sup>	RMSE	MAPE	BIC
0.181	464814.960	464814.960	26.249
Ljung-Box Q (18)			
Statistics	df	Sig.	Number of outliers
6.275	17	0.991	0

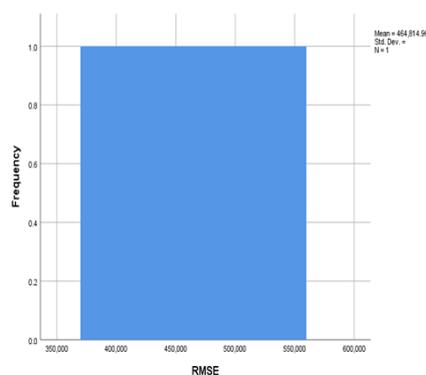
Source: Author's research. \* Best-Fitting Models according to Normalized BIC (smaller values indicate better fit).

In order to approach data processing using the expert modeler, the fitting parameters of the given model were established. By comparing the Root Mean Square Error (RMSE) and the Normalized Bayesian information criterion (BIC) measure, the accuracy of the prediction is determined, and based on the obtained data, a forecast is made, and a conclusion is drawn as to whether the selected model fits the data. The time series model takes into account error, trend and seasonal components in selecting the best model by optimizing initial values and parameters. Also, the values of R-square, MAPE (Mean Absolute Percentage Error) and Ljung-Box provide data on the suitability of the model. Table 1 shows the obtained results of the estimated autoregression parameters: E=0.460, SE=0.199, t=2.306, with statistical significance of the model: sig=0.33.

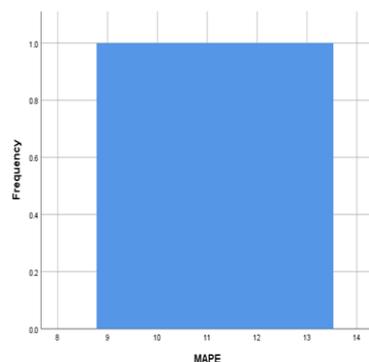
The RMSE value indicates a good fit of the model. Also, a high R-squared value and MAPE indicate perfect prediction relative to the mean value. The Ljung-Bock statistic of the model with a statistic value of 6.275, df=17 and p=.991 indicates that the model adequately captures the correlation in the time series (Figure 1,2 and Figure 3,4).



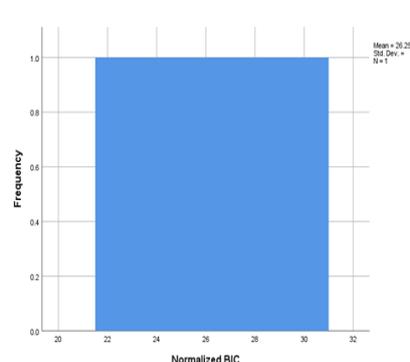
**Figure 1. Values of R<sup>2</sup>**



**Figure 2. Values of RMSE**



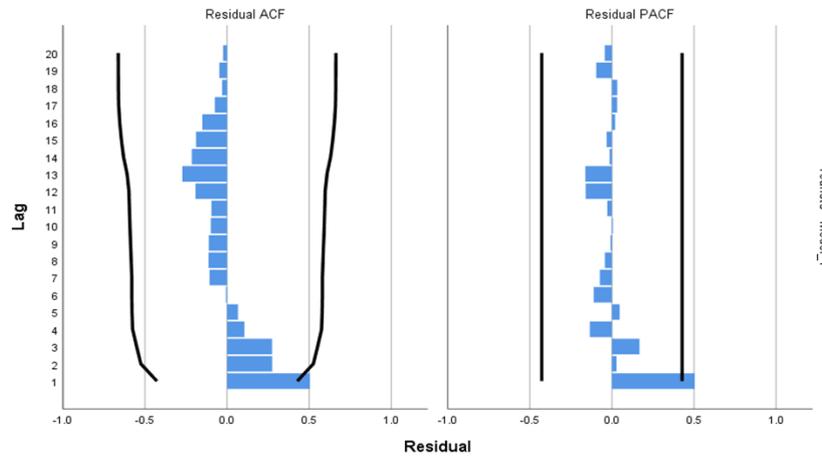
**Figure 3. Values of MAPE**



**Figure 4. Values of Normalized BIC**

Source: Author's research Source: Author's research

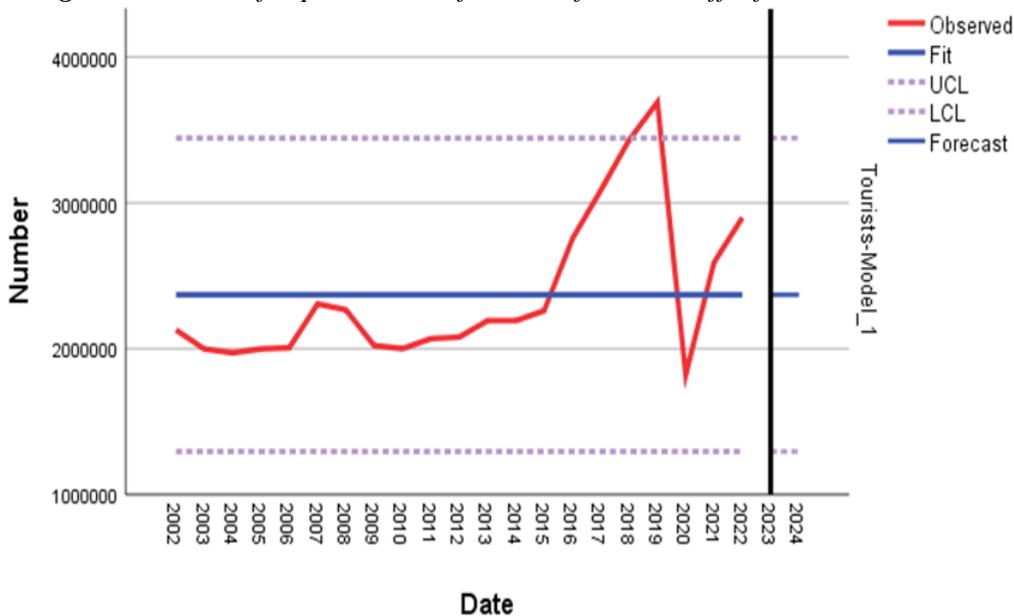
The diagram in figure 5 shows the Values of Residual ACF and PACF. The figure shows Autocorrelation Function (ACF) and Partial Autocorrelation Function (PACF) plots. ACF and PACF assume stationarity of the underlying time series. ACF explains how the present value of a given time series is correlated with past values. The PACF is a partial autocorrelation function that accounts for the partial correlation between the series and the lag itself.



**Figure 5.** Values of Residual ACF and PACF  
 Source: author's research

The Figure 5 show the adequacy of the model, because the residual acf and pacf diagrams show random variations, so that from the zero value all the points below and above are uneven, so it is concluded that the model is adequate or reliable. The dynamics of tourist traffic from 2002 to September 2022, with forecast values for the next two years, is given in the Figure 6.

**Figure 6.** Results of expert modeler forecast of tourist traffic for 2023 and 2024



Source: author's research

There is a constant growth in tourist traffic, with the exception of minor fluctuations during the SARS crisis in 2003, and the world economic crisis during 2007 to 2009. After that, until the emergence of the COVID-19 pandemic, tourism had its rise. The curve shows the biggest and unprecedented sudden drop in 2020. However, the analysis of time series predicts the growth of tourist traffic in the next two years in a value below that which was before the pandemic. During 2019, tourist traffic amounted to a total of 3,689,983 tourists, which is the highest figure in the observed period. The results of the research

indicate that the increase in the number of tourists will reach the value of 2,369,547. Hypothesis H1 was confirmed: that tourism will reach some values from before the onset of the pandemic, but not the same maximum during that period. UCL and LCL give lower and upper limit values, taking into account the possibility of standard error (Table 3).

*Table 3. Forecast model values for 2023 and 2024*

<b>Tourists-Model_1</b>	<b>Forecast</b>	2959536	3018507
	UCL	3946139	4005605
	LCL	1972933	2031410

*Source: Author's research*

## CONCLUSION

It is certain that it will never be precisely determined how much damage the COVID-19 pandemic has caused to the world economy. This sector also includes tourism, which before the onset of the pandemic recorded constant growth. However, since the end of 2019, tourist traffic has dropped sharply. The reason is the spread of the pandemic, the closing of borders, the restricted movement of people, as well as many other security measures set by governments. In that period, the passing of domestic tourism was marked, and the profile of the ecological tourist was created or strengthened, the trend of which is still growing. A rough picture and the results of trends in the economy and tourism can be obtained by forecasting in relation to previous years for which statistical data can be found. The pandemic had a negative impact on tourism, but it also opened up opportunities for new forms of tourism and other forms of business. By the end of 2019, Serbian tourism had a constant increase in tourist traffic, where a total of 3,689,983 tourists were recorded in 2019. However, with the onset of the pandemic, it reached its lowest values since the 80s. There are data that 134.800 employees in the tourism industry were registered in Serbia by 2019, which is about 6.2% of the total number of employees. 4,500 employees worked in 1,230 travel agencies [50]. With the closing of borders and limited movement, tourism in Serbia is experiencing a collapse, and at the same time, a trend is being created of tourists going to rural areas to escape the pandemic. There are numerous studies on the topic of forecasting tourist traffic in the world. Tourism experienced its downfalls before, during the SARS epidemic and the world global crisis. However, the general conclusion of most research is that tourism has never experienced such a decline until the emergence of COVID-19. The key question is whether tourism will soon recover and reach the values from 2019, or even surpass them.

The goal of this research was to determine the growth of tourist traffic in Serbia in the next two years, based on data from the Statistical Office of the Republic of Serbia. The data, which were downloaded, cover a series of 20 years back, from 2002 to September 2022. The TSA (time series analysis – expert modeler) model of time series was used to forecast tourist traffic, in SPSS software, version 26.00. The suitability parameters showed that it is possible to approach time series analysis and arrive at key forecasting results. Based on the obtained results, it was established that it is possible that the number of tourists in the next two years will reach a value slightly above 2.369.547 tourists. This confirmed hypothesis H1a, that tourism will reach some of the values it had before the pandemic. Other hypotheses were rejected. The results of the time series analysis indicate that the number of tourists will not exceed the level from before the pandemic. Some of the data show that tourism in Serbia is well on its way to being completely rebuilt. In support of this is the fact that the foreign exchange inflow from tourism in Serbia for 10 months of this year amounted to almost 1.3 billion euros, which is a growth of 49 percent compared to the same period in 2020 (Statistical Office of the Republic of Serbia).

There are no studies that indicate a reduced number of tourist arrivals in the Republic of Serbia due to new circumstances such as war conflicts and energy instability. On the contrary, the influx of arrivals from Russia has increased, and these people have mainly come to do business with Europe because they are unable to conduct business transactions from Russia. However, they are still not treated as tourists, nor as fugitives.

The fact is that every research has some shortcomings and limiting circumstances. However, given that this research used the data of the Statistical Office of the Republic of Serbia, which are available in the online version, there were no limiting circumstances, because the research was not carried out in the field and with people. However, for a better analysis of time series, have data on a monthly or quarterly

level for better data differentiation, but such data are not available for every year, except for annual data. One of the thing that can be brought under limiting circumstances is the fact that there are no accurate data on whether the pandemic has completely stopped anywhere in the world, and whether it will return again, which would make the research completely pointless and the results would not be even remotely representative and valid.

The results of the research have theoretical and applied significance in the future. It can be said that the research data will be available to all subjects in the field of tourism, and will serve as information for determining the determinants of their future business. Especially if it is taken into account that the recurrence of similar unforeseen situations is possible. By observing the results and further monitoring, tourist companies can prepare for similar situations and react in a way to continue doing business in a crisis, and not lose economic benefits. Also, the results can be applicable to complement the literature on the movement of tourist traffic during the crisis, as well as its recovery. During and after the pandemic, the state encouraged the development and recovery of tourism in Serbia by distributing vouchers worth RSD 5.000. This increased the demand for domestic tourism, and all hopes were placed that domestic tourists would stay longer at domestic destinations. Some of the strategic measures that could be taken are certainly adherence to safety measures, because the pandemic has not yet officially ended, but also further work on creating business conditions in crisis situations, so that tourism does not come to a complete halt. One of the proposals is certainly investment in ecological, mountainous and rural areas, which were key destinations during the closure.

## REFERENCES

- [1] Aleksić, M., Popov Rajlić, J., Gajić, T., Blešić, I., Dragosavac, M., Penić, M., & Bugarčić, J. (2022). Factors of Airline Selection and Reflight Intention During the Pandemic/Case of Serbian Airlines Users. *Frontiers in Psychology*, 1-10. <https://doi.org/10.3389/fpsyg.2022.91532>
- [2] Gajić, T., Zrnić, M., Vujić, T., Vujić, M., Stojanović, Đ. (2022a). Gastronomy Offer in a Function of Creation and Co-creation of a Recognized Hotel Brand -Illustrations from Hotel Crni Vrh. *Economics of Agriculture*, 69(3), 749-763. <https://doi.org/10.5937/ekoPolj2203749G>
- [3] Gajić, T., Penić, M., & Vukolić, D. (2022b). The impact of fear of COVID-19 infection on consumers' intention to visit restaurants. *Hotel and Tourism Management*, 2022, 10 (1), 67-78. <https://doi.org/10.5937/menhottur2201067G>
- [4] Zrnić, M., Kilibarda, N., Brdar, I., Vujić, M., & Stojanović, D. (2021). Food safety and eating habits during pandemic COVID-19 in the Republic of Serbia. *Економика пољопривреде*, 68(4), 895-910. <https://doi.org/10.5937/ekoPolj2104895Z>
- [5] Halimi, L., Bagheri, N., Hoseini, B., Hashtarkhani, S., Goshayeshi, L., & Kiani, B. (2020). Spatial analysis of colorectal cancer incidence in Hamadan Province, Iran: a retrospective cross-sectional study. *Applied Spatial Analysis and Policy*, 13(2), 293-303. <https://doi.org/10.1007/s12061-019-09303-9>
- [6] Su, Z., McDonnell, D., & Wen, J. (2021). Mental health consequences of COVID-19 media coverage: the need for effective crisis communication practices. *Global Health*, 17(4). available at: <https://coronavirus.jhu.edu/map.html>
- [7] Rather, R. A. (2021). Demystifying the effects of perceived risk and fear on customer engagement, co-creation and revisit intention during COVID-19: A protection motivation theory approach. *Journal of Destination Marketing & Management*, 20, 100564. <https://doi.org/10.1016/j.jdmm.2021.100564>
- [8] Aqeel, M., Abbas, J., Shuja, K. H., Rehna, T., Ziapour, A., Yousaf, I., & Karamat, T. (2021). The influence of illness perception, anxiety and depression disorders on students mental health during COVID-19 outbreak in Pakistan: a web-based cross-sectional survey. *International Journal of Human Rights in Healthcare*, 15(1), 1-14. <https://doi.org/10.1108/IJHRH-10-2020-0095>
- [9] Su, Z., Wen, J., Abbas, J., McDonnell, D., Cheshmehzangi, A., Li, X., & Cai, Y. (2020). A race for a better understanding of COVID-19 vaccine non-adopters. *Brain, behavior, & immunity-health*, 9, 100159. <https://doi.org/10.1016/j.bbih.2020.100159>
- [10] Wang, Y. (2020). Health care and mental health challenges for transgender individuals during the COVID-19 pandemic. *Lancet Diabetes Endocrinol*, 8(7),564–566. [https://doi.org/10.1016/S2213-8587\(20\)30182-0](https://doi.org/10.1016/S2213-8587(20)30182-0)
- [11] Bhati, A. S., Mohammadi, Z., Agarwal, M., Kamble, Z., & Donough-Tan, G. (2021). Motivating or manipulating: The influence of health-protective behaviour and media engagement on post-COVID-19 travel. *Current Issues in Tourism*, 24(15), 2088-2092. <https://doi.org/10.1080/13683500.2020.1819970>
- [12] UNWTO, 2020, 2022. available at: <https://www.unwto.org/>

- [13] Bae, S. Y., & Chang, P. J. (2021). The effect of coronavirus disease-19 (COVID-19) risk perception on behavioural intention towards 'untact' tourism in South Korea during the first wave of the pandemic (March 2020). *Current Issues in Tourism*, 24(7), 1017-1035. <https://doi.org/10.1080/13683500.2020.1798895>
- [14] Shawky, S., Kubacki, K., Dietrich, T., & Weaven, S. (2019). Using social media to create engagement: A social marketing review. *Journal of Social Marketing*, 9(22), 204-224. <https://doi.org/10.1108/JSOCM-05-2018-0046>
- [15] Höpken, W., Eberle, T., Fuchs, M., & Lexhagen, M. (2021). Improving Tourist Arrival Prediction: A Big Data and Artificial Neural Network Approach. *Journal of Travel Research*, 60, 998–1017. <https://doi.org/10.1177/0047287520921244>
- [16] Oklevik, O., Gössling, S., Hall, C.M., Jacobsen, J.K., Grotte, I.P., & McCabe, S. (2019). Overtourism, optimisation, and destination performance indicators: A case study of activities in Fjord Norway. *Journal of Sustainable Tourism*, 27, 1804–1824. <https://doi.org/10.1080/09669582.2018.1533020>
- [17] Maqsood, A., Abbas, J., Rehman, G., & Mubeen, R. (2021). The paradigm shift for educational system continuance in the advent of COVID-19 pandemic: mental health challenges and reflections. *Current Research in Behavioral Sciences*, 2, 100011. <https://doi.org/10.1016/j.crbeha.2020.100011>
- [18] Lukić, V., Lović Obradović, S., & Čorović, R. (2022). COVID-19 AND INTERNAL MIGRATION IN SERBIA—GEOGRAPHICAL PERSPECTIVE. *Journal of the Geographical Institute "Jovan Cvijić" SASA*, 72(2), 191–205. <https://doi.org/10.2298/IJGI2202191L>
- [19] Gursoy, D., & Chi, C.G. (2020). Effects of COVID-19 pandemic on hospitality industry: Review of the current situations and a research agenda. *Journal of Hospitality Marketing and Management*, 29, 527–529. <https://doi.org/10.1080/19368623.2020.1788231>
- [20] Hu, X., Yan, H., Casey, T., & Wu, C.H. (2021). Creating a safe haven during the crisis: How organizations can achieve deep compliance with COVID-19 safety measures in the hospitality industry. *International Journal of Hospitality and Management*, 92, 102662. <https://doi.org/10.1016/j.ijhm.2020.102662>
- [21] Li, M. W., Teng, H. Y., & Chen, C. Y. (2020). Unlocking the customer engagement-brand loyalty relationship in tourism social media: The roles of brand attachment and customer trust. *Journal of Hospitality and Tourism Management*, 44, 184-192. <https://doi.org/10.1016/j.jhtm.2020.06.015>
- [22] Ioannides, D., & Gyimóthy, S. (2020). The COVID-19 crisis as an opportunity for escaping the unsustainable global tourism path. *Tourism Geographies*, 22(3), 624-632. <https://doi.org/10.1080/14616688.2020.1763445>
- [23] Abbas, J., Mubeen, R., Iorember, P.T., Raza, S., & Mamirkulova, G. (2021). Exploring the impact of COVID-19 on tourism: Transformational potential and implications for a sustainable recovery of the travel and leisure industry. *Current Research of behavioral Sciences*, 2, 100033. <https://doi.org/10.1016/j.crbeha.2021.100033>
- [24] Farzanegan, M.R., Gholipour, H.F., Feizi, M., Nunkoo, R., & Andargoli, A.E. (2021). International Tourism and Outbreak of Coronavirus (COVID-19). A Cross-Country Analysis. *Journal of Travel Research*, 60, 687–692. <https://doi.org/10.1177/00472875209315>
- [25] Ertuna, B., Karatas-Ozkan, M., & Yamak, S. (2019). Diffusion of sustainability and CSR discourse in hospitality industry: Dynamics of local context. *International Journal of Contemporary Hospitality and Management*, 31, 2564–2581. <https://doi.org/10.1108/IJCHM-06-2018-0464>
- [26] Vukolić, D., Gajić, T. and Penic, M. (2022). The effect of social networks on the development of gastronomy – the way forward to the development of gastronomy tourism in Serbia. *Journal of Tourism Futures*, Vol. ahead-of-print No. ahead-of-print. <https://doi.org/10.1108/JTF-01-2022-0034>
- [27] Yakovenko, N. V., Komov, I. V. (2021). The Ecosystem Approach to Assessing the Quality of the Urban Environment and Managing Urban Development. In *Innovations and Traditions for Sustainable Development*, pp. 87-106, Springer, Cham, available at: [https://doi.org/10.1007/978-3-030-78825-4\\_6](https://doi.org/10.1007/978-3-030-78825-4_6)
- [28] Turner, L. W., & Witt, S. F. (2001). Forecasting tourism using univariate and multivariate structural time series models. *Tourism Economics*, 7, 135–147. <https://doi.org/10.5367/00000001101297775>
- [29] Zhang, H., Zhang, H.H., Song, H., Song, L., Long, W., Chang, W., & Chang, L. (2021). Forecasting tourism recovery amid COVID-19. *Annals of Tourism Research*, 87(4):103149. <https://doi.org/10.1016/j.annals.2021.103149>
- [30] Jones, P., & Comfort, D. (2020). The COVID-19 crisis and sustainability in the hospitality industry. *International Journal of Contemporary Hospitality and Management*, 32, 3037–3050. <https://doi.org/10.1108/IJCHM-04-2020-0357>
- [31] Nicola, M., Alsaifi, Z., Sohrabi, C., Kerwan, A., Al-Jabir, A., Iosifidis, C., Agha, M., & Agha, R. (2020). The socio-economic implications of the coronavirus pandemic (COVID-19). *International Journal of Surgery*, 2020, 78, 185–193. <https://doi.org/10.1016/j.ijsu.2020.04.018>

- [32] Li, G., Wong, K.K., Song, H., & Witt, S.F. (2006). Tourism demand forecasting: A time varying parameter error correction model. *Journal of Travel Research*, 45, 175–185. <https://doi.org/10.1177/0047287506291596>
- [33] Chen, J.L., Li, G., & Wu, D.C. (2019). Shen, S. Forecasting Seasonal Tourism Demand Using a Multiseries Structural Time Series Method. *Journal of Travel Research*, 58, 92–103. <https://doi.org/10.1177/0047287517737191>
- [34] Fu, Y., Hao, J.X., Li, X., & Hsu, C.H. (2019). Predictive Accuracy of Sentiment Analytics for Tourism: A Meta- learning Perspective on Chinese Travel News. *Journal of Travel Research*, 58, 666–679. <https://doi.org/10.1177/0047287518772361>
- [35] Song, H., Wong, K. K., & Chon, K. K. (2003b). Modelling and forecasting the demand for Hong Kong tourism. *International Journal of Hospitality Management*, 22(4), 435–451. <https://doi.org/10.1080/19388160802711386>
- [36] Lin, V. S., Goodwin, P., & Song, H. (2014). Accuracy and bias of experts' adjusted forecasts. *Annals of Tourism Research*, 48, 156-174. <https://doi.org/10.1016/j.annals.2014.06.005>
- [37] Ghalekhondabi, I., Ardjmand, E., Young, W., & Weckman, G. (2019). A review of demand forecasting models and methodological developments within tourism and passenger transportation industry. *Journal of Tourism Futures*, 5, 75–93. <https://doi.org/10.1108/JTF-10-2018-0061>
- [38] Alessi, L., Ghysels, E., Onorante, L., Peach, R., & Potter, S. (2014). Central bank macroeconomic forecasting during the global financial crisis: The European Central Bank and Federal Reserve Bank of New York experiences. *Journal of Business & Economic Statistics*, 32(4), 483-500. available at: <https://www.ecb.europa.eu/pub/pdf/scpwps/ecbwp1688.pdf>
- [39] Song, H., Witt, S. F., & Li, G. (2003a). Modelling and forecasting the demand for Thai tourism. *Tourism Economics*, 9(4), 363–387. <https://doi.org/10.5367/000000003322663186>
- [40] Smeral, E. (2004). Long-term forecasts for international tourism. *Tourism Economics*, 10, 145–166. <https://doi.org/10.5367/000000004323142461>
- [41] Nguyen, L. Q., Odete Fernandes, P., & and Teixeira, J.P. (2022). Analyzing and Forecasting Tourism Demand in Vietnam with Artificial Neural Networks, *Forecasting* 4, 1, 36-50. <https://doi.org/10.3390/forecast4010003>
- [42] Goh, C., & Law, R. (2011). The methodological progress of tourism demand forecasting: A review of related literature. *Journal of Travel & Tourism Marketing*, 28(3), 296-317. <https://doi.org/10.1080/10548408.2011.562856>
- [43] Sheldon, P. J., & Var, T. (1985). Tourism forecasting: A review of empirical research. *Journal of Forecasting*, 4(2), 183-195. <https://doi.org/10.1002/for.3980040207>
- [44] Gunter, U., & Önder, I. (2015). Forecasting international city tourism demand for Paris: Accuracy of uni and multivariate models employing monthly data. *Tourism Management*, 46, 123–135. <https://doi.org/10.1016/j.tourman.2014.06.017>
- [45] Athanasopoulos, G., Song, H., & Sun, J. (2018). Bagging in Tourism Demand Modeling and Forecasting. *Journal of Travel Research*, 57, 52–68. <https://doi.org/10.1177/0047287516682871>
- [46] Hassani, H., Silva, E., Antonakakis, N., Filis, G., & Gupta, R. (2017). Forecasting accuracy evaluation of tourist arrivals. *Annals of Tourism Research*, 63, 112–127. 1 <https://doi.org/10.1016/j.annals.2017.01.008>
- [47] Sun, S., Wei, Y., Tsui, K.L., & Wang, S. (2019). Forecasting tourist arrivals with machine learning and internet search index. *Tourism Management*, 70, 1–10. <https://doi.org/10.1016/j.tourman.2018.07.010>
- [48] Kucharavy, D., & De Guio, R. (2005). Technological Forecasting and Assessment of Barriers for Emerging Technologies. The 17th International Conference on Management of Technology (IAMOT 2008), Dubai, United Arab Emirates, 219-235. available at: [https://www.researchgate.net/publication/29635339\\_Technological\\_Forecasting\\_and\\_Assessment\\_of\\_Barriers\\_for\\_Emerging\\_Technologies](https://www.researchgate.net/publication/29635339_Technological_Forecasting_and_Assessment_of_Barriers_for_Emerging_Technologies)
- [49] Makridakis, S., Anderson, A., Carbone, R., Fildes, R., & Hibon, M. (1982). The accuracy of extrapolation (time series) methods: results of a forecasting competition. *Journal of forecasting* 1, 111-153. <https://doi.org/10.1002/for.3980010202>
- [50] Box, G. E. P., & Jenkins, G. M. (1976). Time Series Analysis; Forecasting and Control, Holden-Day Inc. U.S.A. 3. Box, G. E. P., & Jenkins, G. M. (1976). Time Series Analysis; Forecasting and Control, Holden-Day Inc. U.S.A. available at:
- [51] Statistical Office of the Republic of Serbia, [www.stat.gov.rs](http://www.stat.gov.rs)

**Article history:**

Received 7 February 2023

Accepted 10 December 2023

# THE ROLE OF TRADE POLICY IN ENABLING ACCESS TO COVID-19 VACCINES

**POPOVIĆ PETROVIĆ Ivana<sup>1</sup>**

<sup>1</sup>Faculty of Economics, University of Belgrade (SERBIA)

E-mail: ivana.popovic@ekof.bg.ac.rs

## ABSTRACT

*The aim of this paper is focusing on the role of the trade policy measures in managing the faster and more successful allocation of specific products such as vaccines in the midst of the COVID-19 pandemic. The analysis particularly points at the specifics of the pandemic, and their impact on the choice of trade policy measures. The priority was given to the decrease of non-tariff measures in relation to tariffs by creators of the trade policy. After the invention of the COVID-19 vaccines, the possibility to distribute them to all parts of the world without barriers and obstructions was significantly hindered in a several ways. The role of international trade in that process could have been jeopardized by many barriers in trade. The first notable barriers were tariffs as the best-known trade policy measures. Very soon they were followed by Non-tariff Measures which have become more recognizable and frequent. One part of these barriers is related to numerous logistical obstacles as well as to the elimination of administrative non-tariff barriers caused by inefficient work of customs authorities and related inspectorates.*

**Keywords:** vaccines, trade policy, tariffs, Non-tariff Measures, Trade Facilitation Agreement, green lanes, distribution

**JEL:** F10, F13

**DOI:** 10.5937/intrev2304219P

**UDC:** 339.564:615.371

339.542.2

**COBISS.SR-ID** 133936905

## INTRODUCTION

The global outbreak of the Corona virus, known as Pandemic in 2020, caused the world trade to be faced with the deepest global recession since the Second World War and the decrease of the world trade with the sharpest decline of nearly 16 percent during the second quarter of 2020 [1]. It was even more intensive than the effect of the global financial crisis. The world trade suffered the collapse in world services more obvious than the world trade in goods.

The COVID-19 crisis had a strong impact on bilateral trade flows, particularly stressed for countries which had been members of regional trade agreements during pre-Pandemic period. The negative impact was proven concerning governmental actions and the highest negative impact was noted in the case of exports between high-income countries as the example of countries with the similar income levels [2]. The COVID-19 crisis has provoked high level of the overall uncertainty, which was reinforced by the speed of the onset of the crisis itself [3]. These authors followed intensity of the economic uncertainty` increase during the first few weeks after the Crisis started its spreading. About a half of the output contractions during very short period at the start, reflected a negative effect of that uncertainty which was provoked by COVID-19.

There are some opinions that real depth of the global crisis was concealed by government interventions [4]. These interventions in the trade flows had numerous effects, positive and negative. One part of the trade costs was provoked by trade policies at the national levels, mostly presented by tariffs and Non-tariff Measures (NTMs). Although the trade costs recorded sharp decline during last two and a half decades, they became higher in a moment of the pandemic outbreaks. Comparing trade costs in advanced economies in 1995 and 2018, they were decreasing gradually and one-quarter lower in 2018 [1]. However, the Pandemic provoked new rises of trade costs.

The fact that there was a discrepancy between the number of countries exporting and countries importing vaccines and the elements needed to produce them, put the trade in the focus of many research papers. First of all, the focus was on possibilities of trade policy to accelerate the distribution of vaccines and their components around the world in a short period. Trade policy instruments used in that period were oriented towards market access improvements by reducing tariffs and with fostering activities at-the borders.

After the beginning of the complex vaccine manufacturing process and especially after the vaccines trade has started, the World Trade Organization (WTO) has noticed two issues that could be the frame for the main characteristics of these products further production and trade. The first issue was oriented towards tariff barriers in production of vaccines, because it was obvious that many inputs necessary for the vaccines production process had been burdened with higher tariff rates than 5%. The WTO expressed concern that these high tariffs as trade barriers could slow down the production process, increasing the costs of vaccines production and they could impede even the trade flows of these components and finished products over the borders [5]. Members of the WTO were asked to cooperate and to give a support for inputs tariffs decreasing, or their elimination. The other issue refers to the problem of the vaccines trade all over the world, because these specific products and their components faced many bottlenecks in trade, caused by the implementation of the heterogeneous group of NTMs. One of the possible solutions was seen in the implementation of the latest WTO Trade Facilitation Agreement [6]. Only the TF Agreement with its provisions could change these problems scope and that role of this Agreement and the whole TF Process were recognized by the WTO.

## LITERATURE REVIEW

Although it was not expected that the Crisis period would start with the protectionism increase [7], some elements could be found as parts of the trade policy and its applied instruments. Some authors found that during Pandemic, border controls on agricultural trade increased [8]. They found the cause of that situation in the lack of the formal coordination between the World Health Organization (WHO) and the WTO, concerning their intention to prevent the cross-border transmission of the virus. At the very beginning of the Pandemic, during short period from March to July 2020, even 90 countries implemented strict measures for pandemic related goods [9]. The source of the problem was not only their restrictiveness, with the aim to prevent the virus spreading, but the fact that they were uncoordinated in implementation process, too.

The role of trade during this Pandemic crisis and especially when vaccines appeared should not be observed as the problem, but as the solution, or at least, the part of the solution [10]. The COVID-19 crisis has provoked adjustments for all levels: multinational, regional, national and even for trade companies all over the world. These companies recorded serious problems, but trade companies selling food products achieved opposite, positive results [11]. During the COVID-19 Crisis were implemented numerous trade measures, consisting of tariffs and NTMs. The effects of their implementation were both, facilitating and restricting too.

At the very start of the COVID-19, instruments of trade policy became important response to the health crisis, used dominantly for Medical supplies and Food. This could be considered as trade policy activism, although these instruments were used differently, showing great heterogeneity across countries. The aim of their implementation in some countries was the exports restriction, as well as imports facilitation. Some countries implemented only instruments for one of these aims` achievement. There are also even countries implementing no instruments of trade policy [12].

After the outbreak of the Pandemics, until August 2020, it was implemented 384 trade measures as the response of trade policy to Pandemic. But, between these measures, NTMs were dominant with the number of 283. Some of these NTMs had the facilitating character, only 104 of them, but the other 179 NTMs, had the restricting impact and they were dominant. Quite the opposite character was the use of tariffs — they were mostly Trade Facilitating with the number of 97 and only 4 Trade Restricting [13]. Some of these Trade Facilitating measures were applied mostly on imports of goods, in the form of tariffs exemptions, easing non-automatic licensing and the Sanitary and Phytosanitary requirements for Food and Medical Supplies, among which were vaccines and components for vaccines production. At the contrary, the Trade Restricting measures mostly were implemented towards exports with the aim to prevent shortages [13].

One of the many ways to reduce these barriers in trade was the introduction of e-certification of SPS measures. In many countries the SPS approach achieved its acceleration using digital technologies for exchange of the SPS electronic certificates and for the verification of SPS compliance [14]. Individual solutions mitigated the consequences of increased restrictions. At the start of the Pandemic, seeing the negative effects especially at the border crossings, “green lanes” were established, as the contribution for expediting the Essentials movement [15]. The CEFTA 2006 economies established CEFTA Coordination Body, including CEFTA Contact Points, to establish “Green priority corridors” and “Green priority border/common crossing points” [16]. The “Green priority corridors” had the aim to give the priority for Essentials, mostly Food and Medical supplies.

Trade is seen as the opportunity to start the recovery after the COVID crisis, especially on the Emerging markets and Developing economies. However, the increase of the trade`s role could be burdened by very high trade costs, observed in recent few decades. The main trade costs are caused by the transport and logistics at one side and cumbersome at-the border procedures [1]. Broadly defined trade costs are all costs caused by the transportation of goods, both, freight and time costs, trade policy barriers both, tariffs and non-tariff barriers, information costs, costs provoked by the usage of the different currencies, legal and regulatory costs and local distribution costs as wholesale and retail [17]. The existence of national border is the source of high trade costs, reducing the trade between industrialized countries by 20-50 percent [18].

## **THE MULTIFUNCTIONAL ROLE OF THE TRADE IN VACCINES**

Trade has the dominant role in enabling access to COVID-19 vaccines, because the production of them is not organized in all countries in the world. On the contrary, only a few producing countries are the source of vaccines all over the world.

The issue of vaccines distribution in the moment they have appeared, provoked other issues and implications for public policies and governments of many countries. Global distribution of vaccines could be monitored from three aspects concerning three mutually competing distribution strategies: vaccine nationalism, vaccine diplomacy and global initiative [19]. Some authors have documented the existence of the small club of vaccine`s producers, caused by their production delays at the beginning of the 2021. This had the consequences in forms of Vaccine Nationalism, such as export curbs which should be decreased, or minimized by policies which should enable more production, fluent distribution of vaccines and all ingredients necessary for their production and other items important to deliver

vaccines [20]. The term vaccine nationalism could take the form of obvious export bans or any forms of limits, with the aim to increase domestic availability of vaccines at the expense of foreign supply [20].

Almost all countries in the world were importers of vaccines, 208 of them, but the number of exporting countries was only 90. The production of vaccines was geographically very concentrated in a few countries. Regarding the export value, the biggest exporters, the first ten of them, were exporting the value of vaccines of about 93%, or 80% of volume [21]. Only one country, as the top exporter, Ireland, exported 28% of global vaccines export value. The side of top importers, although not concentrated as previous one, also was pointing a few significant importers, as USA with 24% of global imports [21].

The importance of the trade role is reflected not only in the distribution and warehousing of already made vaccines, but also in the distribution of inputs, as well as in the primary and secondary packaging that has come from different sides. These inputs and elements needed for the vaccines production, preservation and distribution, are very heterogeneous: stabilizers, preservatives, antibiotics, freezers, cold boxes, vaccine carriers, dry ice, etc.

These vaccine inputs have the origin from a very small number of countries. At least, we can conclude that global markets for inputs are highly concentrated. Only five exporters of these inputs, the EU, USA, Singapore, China and United Kingdom, provided as much as three-quarters of them, during the period 2017-2019. If the inputs for boosting the immune system are added, then the 80% of their origin is concentrated on only a five countries: USA, EU, United Kingdom, China, and Japan [20]. These facts point out the importance of normal producer supply chains functioning.

The trade in vaccines was faced with many obstacles which had to be eliminated, or at least diminished during a short period because all these obstacles could endanger the health of people around the world. The first item was connected with tariffs as the basic element of the trade policy measures, but the challenge of applying NTMs was far more confusing, considering their heterogeneity. And at the end, the logistical barriers, firmly connected with low level of trade capacity in many countries, reflected in the work of customs authorities and related services.

The following data and examples explain the impact and indication of the broad range of measures which could be used by the trade policy to prevent more dramatic consequences, especially during increasingly frequent crises in last few decades.

## **TARIFFS AS BARRIERS IN VACCINES TRADE**

The first element in the creation and trade policy measures implementations certainly are tariffs. During the second half of the XX century, tariffs ceased to be a limiting factor for trading. The trade costs decrease is one of the trade growth's sources. According to some opinions, trade costs make the cross-borders traded goods twice as expensive as domestic goods. And this is not due to high tariffs, because tariffs have the share of only one-fourteenth of average trade costs [1].

During the COVID-19 crisis it was expected that tariffs on vaccines would not have intensive impact on trade decrease. The simple average tariff level for vaccines was only 0.76%, while the average tariff in overall trade was 7.1%, approximately ten times higher. If we add the fact that even four-fifths of 183 countries did not apply tariffs on vaccines imports, then the conclusion that tariffs did not represent a significant barrier was proved [21].

But, there are some differences. Tariffs on vaccines are not the source of important barriers, comparing to tariffs for the import of inputs necessary for the vaccine's production, distribution and administering. Tariffs on inputs created obstacles in trade and became a source of pressure on world prices' increase. Average world tariffs ranged between 2.6-9.4% for numerous vaccines inputs, as stabilizers, antibiotics, preservatives [21]. The average tariff level between 4.4-4.5%, for syringes and needles was implemented for the category of vaccines administering. And for the distribution of vaccines and packaging, high tariffs of even 12.7% stand out [21].

Applied high tariffs for inputs also remained and it was registered by the WTO, during the autumn 2021. However, the WTO attitude mostly was oriented towards TF Agreement provisions, with the aim to remove some of NTMs as important barriers to trade in vaccines. Tariffs in modern times are not any more observed as barriers to trade with hard impact [22].

### Non-tariff Measures

Besides its specifics, pointing its uniqueness, the Crisis has shown some similarities with other economic crisis, especially by analyzing the NTMs. They are a part of the broader group called trade policy measures, which includes this heterogeneous group, as well as tariffs. These trade policy measures have been implemented mostly on Essentials, but even on a small group of non-essential products. These Essentials were Food and Medical Supplies.

After the outbreak of the Pandemic, it was noticed that over 280 NTMs were in use in even 140 countries. Their number was increasing during the time and during the springtime 2021, their number was even 323 [23]. These barriers had different effect on trade. Mostly, they have been trade restricting, with numerous export restrictions with the aim of preventing shortages of Essentials at domestic markets. Their trade restrictive character was supplemented by the implementation of very strict Sanitary and Phytosanitary Measures. These Measures were implemented with the aim to prevent the entrance of the goods of inadequate quality and degree of safety. However, these export restrictions, impeded access to vaccine inputs and could endanger the export of already finished vaccines.

Export measures were dominantly export restrictions oriented towards constraints of the export quantity with more than 95% [24]. In recent economic history, during the Crisis with commodity prices increases during 2006-2008, the export restrictions didn't provide the reduction of prices on domestic markets as potentially positive result. They only raised the level and vulnerability of world prices, and the aim of achieving security on their markets was questionable. The Global Trade Alert's advice is oriented towards narrowing the gap which could be created in the situation like this, between supply and demand for these products, instead of finding solutions in imposing export cubs [25].

Some of NTMs had a trade facilitating impact, expediting trade flows of Essentials and they are connected with many initiatives of the international institutions and with the implementation of the TF Agreement of the WTO. This Agreement was adopted by the members of the WTO in 2013 and entered into force in 2017. It is a result of a long negotiating process focused on the simplification, modernization and harmonization of export and import procedures and processes. For its implementation the main pillar are customs administrations all over the world and their mutual coordination and cooperation with the aim to expedite the movement, clearance and release of goods in trade [26].

Although many steps were taken, UNCTAD estimated that until the March 2021, many restricting NTMs were not any longer implemented, but with the increasing vaccines trade, some new NTMs have appeared, concerning the vaccines trade [23].

Data from March 2021 indicated the expected reaction of Developing countries, which were uniformly interested in a distribution of the produced vaccines (Fig. 1). Measures they were implementing, proved to be only Trade facilitating. Opposite to them, developed countries were primarily focused on obtaining vaccines for their own markets, implementing some of the trade restrictive measures.

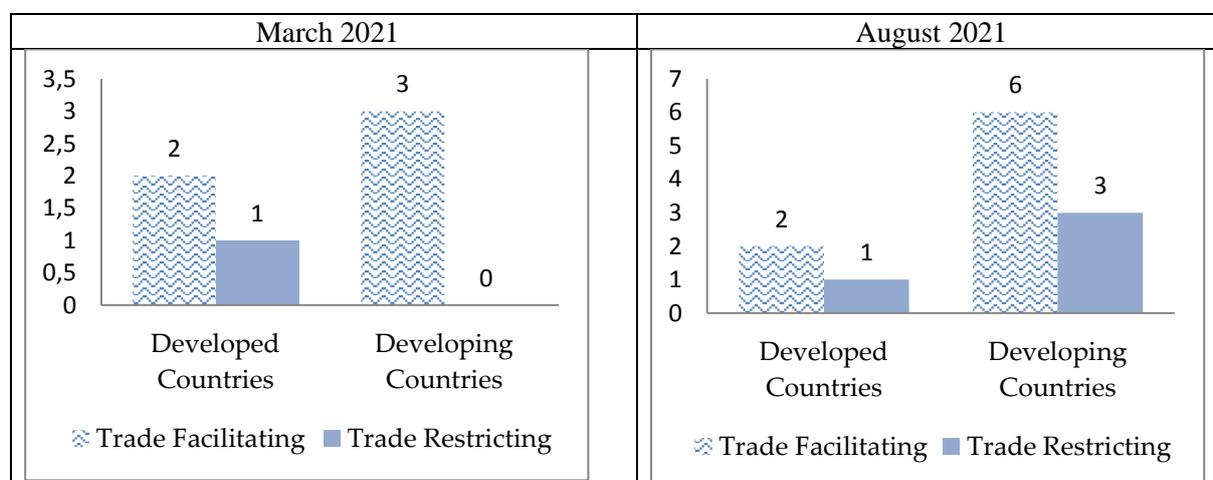


Figure 1. Non-tariff Measures on COVID-19 Vaccines

Source: UNCTAD, COVID-19 and NTMs, Internet, <https://unctad.org/topic/trade-analysis/non-tariff-measures/covid-19-and-ntms>, (27.03.2021.), p. 1.

But the situation was changed during the time, from March until August 2021 and with the spread of produced vaccines. Developing countries showed more interest in distribution of vaccines, as well as keeping already produced and acquired vaccines. That fact explains the appearance of the Trade restricting NTMs in Developing countries, too.

Bottlenecks in cross-borders movement of already completed vaccines and their inputs have different base. The position of completed vaccine in trade is not the same as the position of their inputs, which is unfavorable. If the subject of trade were already completed vaccines, then the border clearance conditions were favorable. The vaccines deliveries became even a media event, but the equipment necessary for administering of vaccines became a source of obstacles, especially for the syringes, refrigerators and other instruments, as a part of the cold chain equipment. In regard to trade in already produced vaccines, their inputs were not subjects of trade using the concept of “green channels”, or other simplified procedures concerning transit, or import and export procedures [22].

Many relevant international institutions have implemented joint initiatives to create a single platform and conditions for the uninterrupted transport of vaccines in the world. When the first information about vaccines appeared, the World Customs Organization (WCO) had the task to support the COVID-19 vaccines distribution by expediting cross-border procedures, as well as to provide the necessary protection against dangerous, or counterfeit vaccines, stating provisions of the recently adopted WTO TF Agreement. At the beginning of the 2021, came the period when WCO, in collaboration with the WHO, prepared the HS classification reference for vaccines and the medical consumables necessary for the vaccination process, with the equipment for storage and transportation of vaccines [27].

During October 2021, the WTO published the revised “Indicative List of Trade-Related Bottlenecks and Trade-Facilitating Measures on Critical Products to Combat COVID-19”, firstly published in July 2021. This List included almost all predictable measures which could be the source of barriers. According with the TF Agreement measures, it gave the recommendations to eliminate, or at least to diminish these barriers impact. The Document identified numerous products, even 83 of them, with important role for manufacturing, distributing and administering vaccines against COVID-19 [22]. These were active and inactive ingredients, even some instruments, bags and equipment. This Document also recognized numerous groups of Trade-Related Bottlenecks: Bottlenecks in the cross-border movement of vaccine inputs, Bottlenecks stemming from vaccine regulatory approval, distribution of finished vaccines and immunization supplies, trade in pharmaceuticals, diagnostics and other medical devices [22]. The List should make it easier to identify this vulnerable product group and allow the implementation of the TF Agreement which accelerates trade flows even under normal conditions. Successfully applied provisions of this Agreement for these defined categories could become an unavoidable instrument during the Pandemic.

## CONCLUSION

Trade policy has the dominant role in enabling manufacturing and after that, distributing and administering already produced vaccines and their inputs, too. The new Pandemic situation has brought many challenges, including the strong change of the trade policy measures. Besides tariffs as the most known measures, international trade faced numerous NTMs, provoked by export restrictions and logistics barriers and cross-border trade activities. This paper analyzed numerous instruments of trade policy, whose characters were both, facilitative and restrictive, and which significantly influenced the speed of the COVID-19 vaccines distribution.

The aim of this paper is to point out the numerous trade policy measures that could be used to achieve the goals of faster and more effective distribution of particularly important products in a very short period of time. It also points out that these measures are very numerous and heterogeneous.

Tariffs, as barriers to trade, were not pointed so intensively concerning the import of vaccines themselves, but concerning the reduction of tariffs for the import of numerous elements, or inputs of the vaccines, or accompanying products required for their exchange. For fast distribution of vaccines, it was not enough to simply abolish tariffs on the import of vaccines, but a combination of trade policy instruments that would be applied for both, trade in vaccines and trade in inputs necessary for their production. This paper indicates the specific role of non-tariff measures in vaccines trade, mostly restrictive by its nature and explains many ways for solving that problem. The main contribution for the NTMs decrease is expected from the WTO initiative for the Trade Facilitation and the implementation of the TF Agreement.

## REFERENCES

- [1] World Bank. (2021). *Global Economic Prospects, June 2021*. Washington, DC: World Bank. doi:10.1596/978-1-4648-1665-9. License: Creative Commons Attribution CC BY 3.0 IGO.
- [2] Barbero J, de Lucio JJ, Rodríguez-Crespo E. (2021). Effects of COVID-19 on trade flows: Measuring their impact through government policy responses. *PLoS One*. Oct 13; 16(10):e0258356. doi: 10.1371/journal.pone.0258356. PMID: 34644312; PMCID: PMC8513914.
- [3] Baker, S. R., Bloom, N., Davis, S. J., & Terry, S. J. (2020). *Covid-induced economic uncertainty* (No. w26983). National Bureau of Economic Research, Cambridge.
- [4] Gavrilović, K., & Vučković, M. (2020). Impact and consequences of the COVID-19 virus on the economy of the United States. *International Review*, 3-4, 56-64. <https://doi.org/10.5937/intrev2003056G>
- [5] WTO (2021a). *WTO Issues Papers on Vaccine Inputs Tariffs and Bottlenecks on Critical COVID-19 Products*, 8.10.2021, Retrieved: [https://www.wto.org/english/news\\_e/news21\\_e/covid\\_08oct21\\_e.htm](https://www.wto.org/english/news_e/news21_e/covid_08oct21_e.htm), (18.01.2022.)
- [6] WTO (2012). Agreement on Trade Facilitation Ministerial Decision of 7 December 2013, WT/MIN (13)/36 WT/L/911
- [7] Baldwin, R. & Evenett, S. (2020). Introduction. In: Baldwin, R. & Evenett, S. (Eds.) *COVID-19 and Trade Policy: Why Turning Inward Won't Work* (pp. 1-19). London: Centre for Economic Policy Research.
- [8] Chen, Kevin Z.; and Mao, Rui. (2020). Fire lines as fault lines: Increased trade barriers during the COVID-19 pandemic further shatter the global food system. *Food Security* 12: 735–738. <https://doi.org/10.1007/s12571-020-01075-2>
- [9] Trade Facilitation Agreement Facility and World Trade Organization. (2020). *The Covid-19 Crisis and Trade Facilitation*. Results of WTO/ICC/Global Alliance for Trade Facilitation Survey. July 2020. Geneva.
- [10] Stellinger, A., Berglund, I. Isakson, H. (2020). How trade can fight the pandemic and contribute to global health. In: Baldwin, R. & Evenett, S. (Eds.) *COVID-19 and Trade Policy: Why Turning Inward Won't Work* (pp. 21-30). London: Centre for Economic Policy Research.
- [11] Staletović, M., Stevanović, M., & Gavrilović, M. (2022). The economic analysis of the business operation of trade companies in the Republic of Serbia during the Covid-19 pandemic. *International Review*, 1-2, 66-70. <https://doi.org/10.5937/intrev2202077S>
- [12] Evenett, S., Fiorini, M., Fritz, J., Hoekman, B., Lukaszuk, P., Rocha, N., Ruta, M., Santi, F., Shingal, A., (2020). "Trade Policy Responses to the COVID-19 pandemic crisis: Evidence from a New Dataset," *RSCAS Working Papers 2020/78*, European University Institute.
- [13] Lee, S. & Prabhakar, D. (2021). *COVID-19 Non-Tariff Measures: The Good and the Bad, through a Sustainable Development Lens*, (UNCTAD/SER.RP/2021/3 Research Paper No.60), Geneva: UNCTAD
- [14] OECD (2021a). *Digital Opportunities for Sanitary and Phytosanitary (SPS) Systems and the Trade Facilitation Effects of SPS Electronic Certification*, OECD Food, Agriculture and Fisheries Paper, March 2021, No. 152.
- [15] OECD (2020). *COVID-19 and International Trade: Issues and Actions*. Paris: OECD.
- [16] Bjelić, P., Popović Petrović, I. and Kastratović, R. (2020). "Foreign Direct Investment Patterns in CEFTA 2006: Perspectives and Impact of COVID-19 Pandemic", *10th SCF International Conference: The Institutional, Economic and Social Impacts of the Globalization and the Liberalization*, University of Usak, 8-11.10.2021, Antalya, Turkey. pp. 45-61.
- [17] Anderson, E. James and Eric van Wincoop. (2004). Trade Costs. *Journal of Economic Literature*. Vol. XLII (September 2004). pp. 691-751.
- [18] Anderson, E. James, and Eric van Wincoop. (2003). "Gravity with Gravitas: A Solution to the Border Puzzle." *American Economic Review*, 93 (1): 170-192.DOI: 10.1257/000282803321455214
- [19] Amankwah-Amoah, J., & Hinson, R. E. (2022). COVID-19 pandemic, vaccine nationalism and counterfeit products: Discourse and emerging research themes. *Thunderbird International Business Review*, 64(6), 595–604. <https://doi.org/10.1002/tie.22302>
- [20] Evenett, S., Hoekman, B., Rocha, N., Ruta, M. (2021). The Covid-19 Vaccine Production Club: Will Value Chains Temper Nationalism? *EUI Working Paper RSC 2021/36*. European University Institute: Robert Schuman Centre for Advanced Studies.
- [21] OECD (2021b). *Using trade to fight COVID-19: manufacturing and distributing vaccines*, 11 February 2021, Tackling coronavirus (COVID-19)- Contributing to a global effort. Paris: OECD.
- [22] WTO (2021b). *Indicative List of Trade-Related Bottlenecks and Trade-Facilitating Measures on Critical Products to Combat COVID-19* (Document Paper, 8.10.2021), Geneva: WTO Secretariat.
- [23] UNCTAD (2021a). COVID-19 and NTMs. Retrieved: <https://unctad.org/topic/trade-analysis/non-tariff-measures/covid-19-and-ntms>, (accessed: 21.03.2021. and 13.03.2022.)
- [24] UNCTAD (2021b). Impact of the COVID-19 pandemic on trade and development—Recovering, but unevenly—Situation as at 31 March 2021, Retrieved: <https://unctad.org/programme/covid-19-response/impact-on-trade-and-development-2021#aTradePolicy>, (accessed: 14.03.2022.)

- [25] GTA (2020). *Tackling Covid-19 Together: the Trade Policy Dimension*. St. Gallen: Global Trade Alert/ University of St. Gallen.
- [26] WTO (2009). *Trade facilitation*, Retrieved: [https://www.wto.org/english/tratop\\_e/tradfa\\_e/tradfa\\_e.htm](https://www.wto.org/english/tratop_e/tradfa_e/tradfa_e.htm), (accessed: 10.03.20022.)
- [27] WCO (2021). *COVID-19 vaccines distribution across borders*, Retrieved: <http://www.wcoomd.org/en/topics/facilitation/activities-and-programmes/natural-disaster/covid19-vaccines-distribution.aspx>, (accessed: 4.03. 2021).

**Article history:**

Received 6 April 2022

Accepted 21 September 2023

# CONVENTIONAL OR ORGANIC PRODUCTION IN KOSOVO AND METOHIJA - PROSPECTS AND CHALLENGES

**BOJIČIĆ Radica<sup>1</sup>, TRIPKOVIĆ Anđelka<sup>2</sup>, MLADENOVIĆ Maja<sup>3</sup>**

*<sup>1,2,3</sup>University of Priština, Faculty of Economics, Kosovska Mitrovica (SERBIA)*

*Emails: radica.bojicic@pr.ac.rs; andjelka.tripkovic@pr.ac.rs; maja.mladenovic@pr.ac*

## ABSTRACT

*Due to natural potentials and resources that nature has bestowed upon them, the people in the province of Kosovo and Metohija are largely committed to agricultural production of various types of fruits, vegetables, grains, medicinal plants, as well as livestock production. This paper strives to, based on the research conducted, analyze and compare agricultural activities in certain majority-Serb municipalities in the north and south of Kosovo and Metohija, as well as to consider the possibilities and willingness of farmers to reorient the entire production process from conventional to organic. Furthermore, suggestions and recommendations were made with respect to what could be done to promote green agricultural production, while at the same time overcoming numerous challenges related to the daily life and work of people in these areas.*

**Keywords:** *organic agriculture, production, majority-Serb areas in Kosovo and Metohija, economic development*

**JEL:** J43

**DOI:** 10.5937/intrev2304227B

**UDC:** 338.432(497.115)

631.147

**COBISS.SR-ID** 133938697

## INTRODUCTION

Environmental protection issues, finding clean sources of energy, reducing carbon dioxide emissions, recycling and the like have been the focus of attention in recent years. Desiring to enhance quality of his life, man has selfishly exploited natural resources causing the natural balance to deteriorate thus creating a number of issues that are now taking its toll on the quality of life of the entire humanity [[1]]. Based on the above-mentioned, and bearing in mind the expansive growth of the organic market on a global level, nowadays there is more and more talk about organic food production, which implies a completely healthy process for humans and the environment, without the use of chemical agents.

It could be said that Serbia's agriculture is characterized by small agricultural holdings with fragmented plots of land mostly owned by individuals [[2]]. Eco-friendly farming has emerged as the only solution to bringing sustainability to agriculture [[3]]. The methods of agricultural production on fragmented farms in Kosovo and Metohija were traditionally passed down from generation to generation, and new times have set new trends in the agricultural sector of majority-Serb municipalities in Kosovo and Metohija. Organic farming sector in Serbia has been growing steadily, as well as the number of certified organic producers (reaching 458 in 2022) [4]. So far, there have been no major breakthroughs concerning serious organic agricultural production in Kosovo and Metohija.

## RESEARCH METHODOLOGY

The authors of the paper designed an original questionnaire that was used to collect data necessary for completion of the research task. The research was conducted in 2021 in 5 majority-Serb municipalities in Kosovo and Metohija. The first part of the questionnaire included general questions about the respondents, such as gender, age, level of income, size of the household they live in and the municipality they belong to. The second part of the Questionnaire related to questions about the type of production that the respondents are engaged in, their views on the conditions for the development of organic production, the motives for engaging in organic production, the barriers that organic producers encounter in production and marketing, and the subsidies necessary for further development of ecologically healthy production. *IBM SPSS Statistics-version 26* was used for data analysis, in which descriptive statistics, cross-tabulation, normality test and Pearson's correlation coefficient were performed. Research concerning the analysis of organic producers as a factor on which the possibility of developing organic production in Kosovo and Metohija depends is scarce. However, in the last two years, certain research has been carried out, which highlights the importance of the growth of the organic sector in these areas as well.

## FINDINGS AND DISCUSSION

Agricultural production in Kosovo and Metohija is not only a source of livelihood, but also provides social security to a large number of poor and elderly people [[4]]. However, the resource potential of the agricultural sector in Kosovo and Metohija is not sufficiently utilized, regardless of the long-established tradition of growing agricultural crops in these areas.

For the purposes of this paper, 262 respondents from the province of Kosovo and Metohija participated in the research. As regards the gender of respondents, 55.7% of the respondents were male and 44.3% were female. In relation to age, the largest number of respondents are 20-40 years of age (49.2%), and the smallest number of respondents are below 20 years of age (3.9%). The respondents live predominantly in households having 4-5 members (54.6%). In contrast to the respondents living in the villages of Štrpce municipality, among respondents in urban areas and municipal centers in the north of Kosovo and Metohija, a smaller number of

family members is noticeable, mostly up to 3 members (24.8%). When it comes to other socio-demographic characteristics, 36.6% of respondents have obtained master's degrees, more than half of them (56.4%) are employed, while 12.9% are self-employed entrepreneurs.

*Table 1. Sample structure according to gender, age, income, and household size*

MUNICIPALITIES LOCATED IN:	NORTH		SOUTH (ŠTRPCE)	
	Number of respondents (N)	Percentage (%)	Number of respondents (N)	Percentage (%)
<b>Gender</b>				
Male	92	57,1	54	53,5
Female	69	42,9	47	46,5
Total	161	100,0	101	100,0
<b>Age</b>				
< 20	/	/	4	3,9
20 – 40	84	52,2	45	44,6
40 – 60	64	39,7	40	39,6
>60	13	8,1	12	11,9
<b>Income</b>				
< 10 000	8	5,0	6	5,9
10 000 – 30 000	27	16,7	22	21,8
30 000 – 50 000	40	24,8	27	26,7
>50 000	86	53,4	46	45,5
<b>Household size</b>				
1-3 members	40	24,8	16	15,9
4-5 members	92	57,1	51	50,5
6-7 members	28	17,4	27	26,7
8 + members	1	0,6	7	6,9

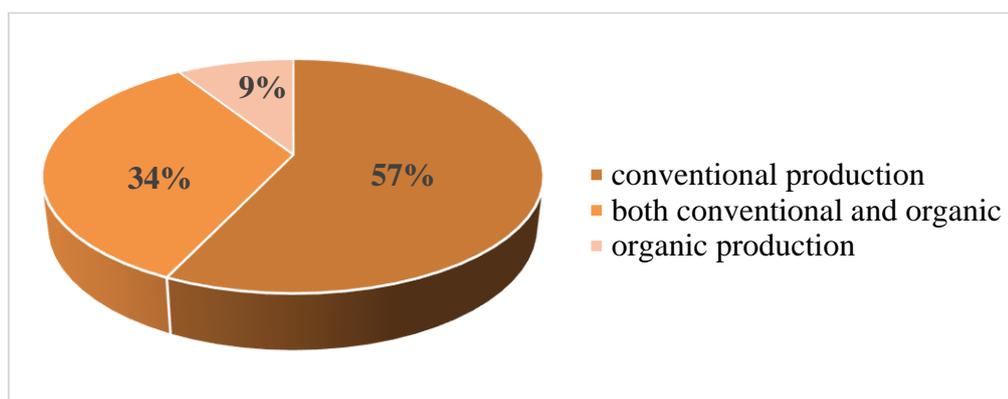
*Source: Authors' research*

The research was conducted in four municipalities belonging to the Kosovska Mitrovica district: Kosovska Mitrovica (29.8%), Zvečan (30.4%), Laposavić (34.2%), and Zubin Potok (5.6%), as well as 12 villages in the municipality of Štrpce which belongs to the Kosovo district (Gotovuša (18.8%), Drajkovce (5%), Bitinja (4%), Sevce (11.9%), Vrbeštica (5%), Štrpce (28.7%), Popovce (1%), Brezovica (5%), Jažnice (7.9%), Berevce (5.9%), Sušiče (4%), and Viča (3%). Natural farming is predominantly the only occupation of the people living in these municipalities, so almost a third of them (31.7%) have been engaged in agricultural production for more than 20 years, and as the main motivation for doing it, they state contribution to the family budget (40.6%), and family heritage (20.8%). According to the respondents, in order to contribute to the livelihood of the family, in addition to agriculture, 29.7% of them are also engaged in related activities, and 23.8% in animal husbandry. More than a third of the respondents (36.6%) claim that they can earn a living from agriculture: "sometimes", 26.7% "can partially earn a living" and only 3% "can completely earn a living" from it. Tradition of farming, bearing in mind the fact that more than 60% of the population lives in rural areas, entails that the revival of areas rich in meadows, pastures and numerous natural resources must be directed towards the revitalization of economic activities that will ensure favorable living conditions, primarily intensification and transformation of agricultural production. When they were asked the following question: "Do you also use chemical agents in your work?", more than half of the respondents (51.5%) said that they use them, but very rarely, 22.8% use them only upon the recommendation of a professional, and 19.8% of the respondents said they do

not use them at all. Namely, in Kosovo and Metohija, on the one hand, there are households that apply the principles of established practice, do not include reduced use of inputs and use outdated machinery, and on the other hand, there are many modern households that are engaged in organic agriculture as one of the increasingly popular technical solutions [[6]].

The rapid growth of the demand for organic food at the global level has not bypassed the local markets of Kosovo and Metohija either, as a result of the needs of modern-day consumers, who have an acute environmental awareness, to buy healthy products. In this regard, 87% of the respondents know what organic products are, while 32.3% of the respondents buy them occasionally. In the past decade, numerous studies were conducted in which a comparative analysis of conventional and organic products was performed. According to Wintera and Davis [[7]], organic production affects the growth of nutrients, which are of great benefit to people's health, which is also confirmed by our research, because 30.7% of the respondents point out that they are aware of the significance of organic production.

The research conducted for the purposes of this paper indicated that a smaller number of respondents are engaged in organic production, and that the primary form of production is still classic (conventional) production. Pessimism and uncertainty are present among the respondents, but this is certainly not a reason to ignore the challenges faced by all those who are in the phase of conversion to organic production. Moreover, it is important to point out that the respondents who live in the places belonging to the Kosovo district displayed a high degree of interest in growing ecologically healthy food in the future, on the condition of having professional help in starting it (25.7%), and health and better nutrition of the family (24.8%), as well as higher incomes and better placement of products (16.8%) are identified as the main reason or motive for "getting to grips" with organic production.



**Fig. 1.** Economic activities the respondents are engaged in  
Source: Authors' research

Organic producers are engaged in the type of production that is typical of the municipality in which they live. Taking into account the natural potential of the municipality where they live, the respondents were asked the following question: "Is organic production possible in your immediate vicinity?". The respondents living in the north of Kosovo and Metohija said that engaging in organic production in their municipality is possible (39.75%), whereas 12.42% of the respondents have no opinion on this issue. The above-mentioned is confirmed by respondents living in areas located south of the Ibar river, so 35.6% of them point out that organic production is possible to a greater extent, and 6.9% of the respondents agree that there are no adequate conditions.

The problems of the Serbian population in places inhabited by a predominantly non-Albanian population are numerous, and they relate to: security, freedom of movement, access to public services, unemployment, use of property, small average land area, lack of adequate mechanization for carrying out agricultural activities, placement and sale of surplus agricultural products, lack of professional

agricultural services [[8]]. The above-mentioned exerts a direct impact on the initiation of organic production, but also on the motives and desire of organic producers to expand production capacity. In the research conducted by Tošović-Stevanović et al., it is stated that a real threat to the economic and sustainable development of agriculture is demographic deterioration of the structure of the agricultural population, as well as the low level of education of decision-makers and employees in farm households [[9]]. According to respondents from the north, major barriers they are faced with in organic production are weather problems (28.7%), and unstable organic markets (20.6%), while the views of respondents from the south are different, who cite insufficient support of the municipality (39.6%), and the insufficient interest of young people (30.7%) as major issues. According to the respondents, their own funds (87%) are the main source of funding they use in organic production, but 95.7% of the respondents point out that they also need subsidies. In light of the above-mentioned, 37.7% of the respondents said that an amount greater than 4,000 euros would really help them continue doing business and making money.

When asked “*What are your plans with regard to agriculture in the future?*”, 34.28% of the respondents from four municipalities in the north of Kosovo and Metohija responded that they plan to expand production, but that they do not have adequate conditions for it, while 15.71% of the respondents pointed out that the lack of knowledge about the basic principles of organic production prevents them from thinking about expanding production. Planning to maintain the current level of production (49.5%), as well as increase one part of organic production (35.6%) is what the respondents from 12 villages in the Kosovo district strive for. Given the fact that the lack of knowledge is one of the main problems that organic producers face, in addition to funding, the respondents also expressed their views on the possibilities of improvement in the field of organic production. Unlike respondents living in the south of the Ibar river, only 3% of whom are interested in undergoing various education/training programs, the respondents from the north are quite interested in undergoing various education/training programs if they were provided in their municipality (28.7%), or by professionals (23.3%).

There is a highly statistically significant relationship between the variables “*municipality you belong to*” and “*type of production you are engaged in*” ( $p = 0,000$ ;  $\rho = 0,034$ ). The municipalities in the Kosovo district have ideal conditions for growing fruits and vegetables, and the Kosovska Mitrovica district has favorable conditions for cultivation of berry fruits and animal husbandry, particularly in places with a higher altitude. In this regard, organic producers in the municipalities of Kosovska Mitrovica and Zvečan are primarily engaged in organic fruit production (11.8%), organic plant production is present in the municipality of Leposavić (20%), while 70% of the respondents in Zubin Potok are engaged in organic livestock production. On the other hand, natural potentials of the Kosovo district, especially the places located at the foot of the Šar mountain, provide various opportunities for the production of organic food in quantities that will not disturb the existing natural balance, and 56.4% of the respondents are engaged in fruit growing, and 14.9% in agriculture. Pearson’s correlation coefficient ( $\rho = -0,145$ ) shows that there is a slight negative relationship between the variables “*type of production you are engaged in*” and “*age of the respondent*”, with a highly statistically significant relationship ( $p = 0,012$ ). The differences between the attitudes of the respondents who are of different ages are the cause of the negative relationship between the observed variables. Namely, the increasing desire for modernization directly leads to frequent migrations, which are also accompanied by young people’s educational aspirations, which they want to satisfy by moving from rural areas to urban (university) centers. An exception is the municipality of Leposavić in the Kosovska Mitrovica district and the villages of Drajkovce, Vrbeštica and Jažnice in the Kosovo district, where young people are increasingly engaged in agricultural production. Furthermore, it was determined that there is a highly statistically significant relationship between “*years of age*” of the respondents and the attitude “*engagement in organic production is possible in the immediate vicinity*” ( $p = 0,001$ ;  $\rho = 0,191$ ). In the north of Kosovo and Metohija, organic production is predominant in the municipality of Leposavić, where an increasing number of producers, in addition to the already mentioned organic crop production, are in the phase of conversion to organic fruit production. As

regards the south of Kosovo and Metohija, according to the respondents, organic production will continue to expand massively in the years to come, in almost all villages located in the municipality of Štrpce. A weak positive relationship ( $\rho = 0,221$ ) between the variables “*organic production is possible in the immediate vicinity*” and “*average household income*” is highly statistically significant ( $p = 0,027$ ). The above-mentioned implies that the respondents who have higher average incomes in the household believe that organic production, in spite of high costs that accompany it, is feasible on the agricultural land that they own. Also, a highly statistically significant relationship ( $p = 0,031$ ) was determined between the variables “*starting organic production is possible in the immediate vicinity*” and “*whether production is only for one’s own needs or for sale*” with the value of the Pearson correlation coefficient ( $\rho = 0,215$ ). The aforementioned weak but positive relationship is a corollary of differences in the development of local organic markets. Namely, the respondents from the north of Kosovo and Metohija mainly produce organic products for their own needs, as well as for the needs of their relatives, while the respondents living in areas south of the Ibar river sell organic products on the local market in the municipality of Štrpce. Through production and placement of organic products on the local market, the municipality can generate surplus income and thus create an economic basis for the sustainable development of multifunctional agricultural households in majority-Serb areas [[8]].

It was also determined that there is a highly statistically significant relationship between the variable “starting organic production is possible in the immediate vicinity” with the following variables with a positive sign:

- “Awareness of the significance of organic production” ( $p = 0,000; \rho = 0,415$ );
- “Would you start organic production in the future” ( $p = 0,000; \rho = 0,550$ );
- “Organic production maximizes profit” ( $p = 0,000; \rho = 0,557$ );
- “Plans related to agriculture in the future” ( $p = 0,000; \rho = 0,486$ ).

Furthermore, a highly statistically significant relationship was observed between the variable “would you start organic production in the future” with the following variables:

- “Average household income” ( $p = 0,000; \rho = 0,341$ );
- “Awareness of the significance of organic production” ( $p = 0,000; \rho = 0,672$ );
- “Organic production maximizes profit” ( $p = 0,000; \rho = 0,423$ );
- “Plans related to agriculture in the future” ( $p = 0,000; \rho = 0,412$ ).

Such positive correlations can be attributed to the fact that organic production has bright prospects in Kosovo and Metohija. A good spatial location of natural potentials in correlation with a positive microclimate, adequate soil types and good landforms enables the cultivation of agricultural crops and the conversion to organic production in all majority-Serb districts and municipalities. The primary goal of developing rural areas in the south, as well as municipal centers in the north, has to be raising the awareness of young people to engage and fight for their households, as symbols of family values. Namely, by encouraging younger generations to derive health, economic, and ecological benefits from growing organic crops in the long run, a regional organic market could be developed where unique products from Kosovo and Metohija, which possess unique smell and taste, could be placed.

The relationship between “*type of production you are engaged in*” and “*investment costs*” is highly statistically significant ( $p = 0,004; \rho = 0,263$ ). It is obvious that organic production leads to certain dissatisfaction at the very beginning, bearing in mind that the yields produced then are not sufficient to cover all production costs. Whether producers will invest in capacity expansion depends on the possibility of product placement and profit realization. In this regard, there is a highly statistically significant relationship between “*type of production you are engaged in*” and “*subsidies*” ( $p = 0,003; \rho = 0,268$ ) which would enhance development of organic production. Good average income per household is one of the reasons why a very small number of respondents from the Kosovska Mitrovica district, especially in the municipality of Kosovska Mitrovica, stated that they did not need any kind of support for their business. Unlike them, the respondents in the Kosovo district said they would start organic production in the future, but are uncertain about it. 31.7% of the respondents would start organic production, but do not plan to expand it to their entire production. 25.7% of the

respondents would like to start it, but only with professional help, while 12.9% of the respondents are already thinking about starting organic production. What is identified as a major problem concerning starting organic production is neither education (2,97%) nor funding (3,96%), but complete support and young people's greater interest. Also, it was found that there is a slight negative relationship ( $\rho = -0,071$ ) between the variables "would you engage in organic production in the future" and "what needs to be done to improve agricultural production", which is highly statistically significant ( $p = 0,482$ ).

## CONCLUSION

The fact that 60% of the population in Kosovo and Metohija lives in rural areas undeniably points out that agriculture is the primary activity in these areas. Based on the conducted research, it can be clearly seen that organic production in Kosovo and Metohija is still in its initial phase, and that farmers who plan to embark on the conversion process towards the production of ecologically healthy food face many challenges and obstacles. Starting from problems caused by weather (un)opportunities and pests, high investment costs, misunderstanding of the importance of organic production, through the challenge of finding reliable organic buyers, all the way to unstable organic markets and the lack of marketing networks, a wide range of barriers that make it difficult for organic producers to do business are confirmed. In these areas, which can be encouraged by establishing a coordinated agricultural policy and implementing sustainable development strategies. Thanks to natural predispositions, but also to hard-working farmers, organic production has good prospects in the predominantly Serbian areas of Kosovo and Metohija. While, on the one hand, there are farmers in the north who have started to apply organic production, farmers in the far south still feel insecure about this issue. Nevertheless, despite the difficult two-decade life of the Serbs living in these areas, most farmers agree that more active involvement of the government is needed, with professional and financial assistance, which would primarily encourage young unemployed people to start their own businesses, so that providing a source of income for their family, as well as their commitment to continue living in these areas. In this way, organic products from Kosovo and Metohija will become even more attractive to customers, which will consequently have a positive impact on the development of the economy and, perhaps more importantly, on environmental protection, and the key to success is patience and persistence. The famous Alexander the Great said: „Nothing is impossible for one who has the desire to try“.

## REFERENCES

- [1] Vujičić, S., Cogoljević, M., Nikitović Z. (2022). The development of ecological awareness in the Republic of Serbia. *International Review*, 1(2), pp. 51-59.
- [2] Milanović, M., Nikitović, Z., Vujičić, S. (2020). The importance of the quality of the agricultural products for sustainable success of agricultural holding, *International Review*, No 3-4, pp. 105-112.
- [3] Singh, M. (2021). Organic farming for sustainable development. *Indian Journal of Organic Farming*, 1(1) pp. 1-8.
- [4] Willer, H., Schlatter, B., Trávníček, J. (2023). The world of organic agriculture – Statistics and Emerging Trends 2023. FiBL, IFOAM – Organics International. ISBN 978-3-03736-456-7.
- [5] Bojčić, R., Tripković, A. (2022). State of organic production in Kosovo and Metohija - great perspective or idea without the future. *Economics of Agriculture*, 69(2), 549–566.
- [6] Bojčić, P., Tripković, A. (2021). Органска производња на Косову и Метохији као шанса за развој српских газдинстава. Међународни научни скуп „Значај Мини Шенгена за евроинтеграције Западног Балкана“, 12-13. новембар 2021.
- [7] Winter, C. K., Davis, S. F. (2006). Organic Foods. *Journal of food science*, 71(9), pp. 117-124.
- [8] Maksimović, M., Milošević, B., Babić, V. (2015). Agricultural cooperatives as a development factor of Serbian enclaves in Kosovo and Metohija. *Agroekonomica*. 44(69). pp. 137-147.
- [9] Tošović-Stevanović, A., Ristanović, V., Stepien S. (2022). Social and economic position of smallholders farmers in Serbia. *International Review*, STEPIEN 1(2), pp. 42-50.

**Article history:**

Received 31 January 2023

Accepted 10 December 2023

# PROCEDURAL LEGITIMATION OF PRIVATE PARTIES BEFORE THE COURT OF JUSTICE OF THE EU IN THE LIGHT OF CARVALHO CASE

VLAJNIĆ Jelena<sup>1</sup>, SPASOJEVIĆ Dorde<sup>2</sup>

<sup>1,2</sup>Faculty of Business Economics and Entrepreneurship, Belgrade (SERBIA)

E-mails: jel.vlajnic@gmail.com; spasojevic.djordje@gmail.com

## ABSTRACT

*The paper discusses the position of private individuals as applicants before the Court of Justice of the EU, particularly in the context of cases related to regulating the consequences of climate change and environmental protection. Individuals wishing to challenge measures of European Union institutions related to climate change face, for now, an insurmountable obstacle in proving the existence of an individual concern as a condition for filing an action. After analyzing the positive legal regulation of procedural legitimacy for private individuals and briefly considering cases before the Court of Justice of the EU related to the regulation of the consequences of climate change, the paper outlines how the Court interprets the existence of an individual concern as a condition for filing an action.*

**Keywords:** European Union, European Union Law, Court of Justice of the European Union

**JEL:** K30

**DOI:** 10.5937/intrev2304234V

**UDC:** 341.645(4-672EU)

349.6(4-672EU)

**COBISS.SR-ID** 133939721

## INTRODUCTION

The Court of Justice of the EU dismissed on March 25, 2021, an application seeking the annulment of several individual acts of the European Union related to the emission of greenhouse gases (hereinafter referred to as GHG gases) due to the lack of direct and individual concern to bring the action [1]. This decision by the Court of Justice follows the established path in cases concerning the regulation of the consequences of climate change, demonstrating that the absence of individual concern, according to this Court, remains an insurmountable obstacle for potential applicants in similar cases. Considering the increasing significance and impact of climate change, as well as the proclaimed ambition of the European Union to regulate its effects, the ruling in the mentioned case once again draws attention to the issue of determining individual concern in environmental protection matters.

## PROCEDURAL LEGITIMACY BASED ON ARTICLE 263 OF THE TREATY ON THE FUNCTIONING OF THE EUROPEAN UNION (TFEU)

A significant legal remedy for challenging acts of the EU considered illegal is an application before the Court of Justice of the European Union. The privileged applicants, who do not need to demonstrate a legal interest to file an action, include member states, the Council of the EU, and the European Commission. On the other hand, natural or legal persons from member states can also seek the annulment of specific acts but only if they can prove a legal interest in doing so. These latter entities are referred to as non-privileged applicants due to the requirement of establishing a legal interest as a condition for bringing an action. The Lisbon Treaty [2] has changed the position of non-privileged applicants, both legal and natural persons, as regulatory acts that are not directly addressed to natural or legal persons no longer require proof that the act "directly and individually affects them [3]."

According to paragraph 2 of Article 263 of the TFEU [4], there are four grounds for annulment of the acts mentioned: lack of competence, procedural irregularity, breach of the treaty, or any rule of law relating to their application, and misuse of powers. Paragraph 4 of the same article has the following content:

"Any natural or legal person may, under the conditions laid down in the first and second paragraphs, institute proceedings against an act addressed to that person or which is of direct and individual concern to them, and against a regulatory act which is of direct concern to them and does not entail implementing measures."

Thus, an individual or legal entity can challenge a particular act if it is addressed to them or if they are directly and individually affected by it. Regarding the first condition, the Court of Justice considers a measure to be of direct interest to the applicant if their legal position is directly affected by that measure. In other words, there must be a direct connection between the contested measure and the damage or loss suffered by the applicant. While a direct interest can be contested, the decisive factor is the individual concern, as was the case in the *Carvalho* matter. For determining the existence of direct and individual concern, the famous definition first formulated in the *Plaumann* case is upheld: persons to whom the decision is not directly addressed can claim a individual concern if the decision affects them based on specific characteristics that only they possess or due to particular circumstances that distinguish them from all other persons, thus making them personally singled out, similarly to the person to whom the decision is directly addressed [5].

This passage discusses the importance of distinguishing between legislative and regulatory acts of the Union, particularly in the context of challenging Union acts without the need to prove an individual concern. The conditions for challenging a Union act without the need to show individual concern include that the contested measure is a regulatory act, of direct concern to the applicant, and does not require the adoption of implementing measures. However, it highlights a terminological confusion as the Treaty on the Functioning of the European Union (TFEU) does not provide a defined concept of a regulatory act, causing ambiguity. The definition of a legislative act is provided in the Treaty, leading to the inference that a regulatory act encompasses everything that is not a legislative act.

Based on Article 263(4) of the TFEU, the requirements for bringing an action by individuals against regulatory acts that do not require the adoption of implementing measures have been relaxed. However, this provision does not apply to the following two situations.

Firstly, if an individual wishes to challenge a non-regulatory act that does not require implementing measures, they still need to prove that the act directly and individually affects them. If an individual cannot demonstrate that the contested act individually affects them, they will be left without a legal

remedy, as they will not have a national executive measure to challenge. Consequently, the individual will not have access to indirect access to the court through the preliminary ruling procedure. The second situation pertains to challenging regulatory or non-regulatory acts that require the adoption of implementing measures. In this case, the individual must prove that the act directly and individually affects them. If the individual cannot meet these conditions, they will still have an open path to judicial protection through the preliminary ruling procedure.

Therefore, the changes introduced by the Lisbon Treaty have eased the conditions for active procedural legitimacy only in situations challenging regulatory acts that do not require the adoption of implementing measures. In such situations, the individual will only need to prove that the act directly concerns them, without the need to demonstrate the existence of an individual concern. However, in other combinations, the individual will still need to prove the existence of an individual and direct concern.

## THE CARVAHLO CASE

The Carvalho Case, also known as the People's Climate Case, was initiated in 2018 by thirty-six individuals engaged in agriculture and tourism in climate-sensitive areas both within and outside of Europe, such as the German North Sea coast and northern Kenya [6]. Climate change poses one of the most dangerous threats to human survival [7]. Having already experienced the consequences of climate change, such as rising sea levels, floods, and droughts, they were dissatisfied with the legislative package from 2018 that regulated the emission of GHG (Greenhouse Gas) for the period 2021-2030. The EU set a goal with these measures to reduce GHG emissions by forty percent compared to the emission levels of 1990. Based on Article 263, paragraphs 1 and 4 TFEU, the applicants requested the annulment of relevant provisions of these acts, arguing that they allowed emissions far exceeding the levels permitted by international law. Claiming that their fundamental rights were violated and invoking, among others, the Paris Agreement, the applicants combined two types of claims: a request for annulment and a request for damages under Article 340, paragraph 2 TFEU. The latter claim is not directed at seeking monetary compensation but rather at ordering the Council and the Parliament to adopt stricter objectives concerning the reduction of GHG emissions by fifty to sixty percent. The applicants stated that they were not interested in monetary compensation but in preventing further damage, thus seeking to establish more stringent emission reduction targets. The application alleges economic and health damages, supported by attached evidence. The fact that the tourism and agribusiness sectors have suffered distinguishes this case from others, such as *Urgenda v. Netherlands*, [8] where the applicants are non-governmental organizations and citizens advocating for the general interest but may not necessarily have suffered harm themselves at the time of initiating the proceedings [9].

The application was first considered by the General Court as the body competent to decide in the first instance on actions brought by natural and legal persons seeking the annulment of Union acts. In 2019, this Court declared the application inadmissible. The Court strictly applied the criteria set out in the *Plaumann* case and concluded that the application lacked the individual concern to bring the action [10]. Thus, an opportunity to address whether the EU can commit to stricter goals for reducing GHG emissions was missed.

The applicants appealed the decision of the General Court, but the Court of Justice of the European Union, as the appellate court, upheld the first-instance decision. According to the applicants' claims, the three contested GHG acts, by allowing harmful emissions, violate the fundamental rights of the applicants and their families. These rights include, among others, the right to life, occupation [11], equal treatment, property, and the well-being of children [12]. [13] This concerns the rights that constitute the content of a broader, collective right—the right to self-determination of a people. This is particularly crucial for members of indigenous communities whose traditional way of life is threatened by the consequences of climate change [14]. The first two grounds of appeal, which were related to locus standi and individual concern, are significant, especially for future cases involving the regulation of the consequences of climate change [15]. The application and appeal followed a two-step approach. The applicants first argued that they indeed had a individual concern in line with the standards set in the *Plaumann* case. If the General Court and the EU Court of Justice were not convinced by their arguments within the first ground of appeal, the applicants requested the Court of Justice to modify these standards to ensure adequate judicial protection in cases of serious violations of fundamental rights [16]. Thus, as an alternative possibility, in case neither the General Court nor the EU Court of Justice recognized the existence of individual concern according to the *Plaumann* test, the applicants provided a request for a revision of the test itself.

The applicants, both in their initial application and in their appeal, stated that the emissions affect them in factually distinct manner. For example, one applicant's family lost their forest estate due to fires caused by heatwaves; another applicant experienced soil degradation on their property due to droughts followed by sudden floods; the property of a third applicant is exposed to rising sea levels and tornadoes; and a fourth applicant's herd of cattle is starving due to harsh winter conditions. Furthermore, the applicants argue that they are also *de jure* individually concerned. They point out that the EU Court of Justice has so far established three types of rights for which individual concern can be determined, and fundamental individual rights are one of them [17]. They further assert that the fact that there are other holders of the same right cannot be relevant since the individual concern is based on the nature of that right as a personal right of the applicant. This means that the infringement of fundamental rights, in and of itself, is distinctive, considering that each fundamental right must be protected regardless of how many people are affected. Although in principle, everyone can enjoy the same rights (such as the right to life or occupation), the consequences of climate change (contributed to by the contested EU acts) and violations of fundamental rights due to these climate changes are distinctive and different for each individual [18]. In contrast, the defendants argued that neither the *de facto* consequences nor the violation of fundamental rights distinguish the applicants from other individuals, which the General Court accepted.

Here, it is necessary to mention another case initiated under Article 263 of the TFEU. The case of *Sabo and Others v. Parliament and Council* [19] involves the annulment of acts related to the regulation of climate change and shares several elements with the *Carvalho* case. In 2019, a group of individuals and civil society organizations from Estonia, France, Ireland, Romania, Slovakia, and the United States filed a lawsuit challenging EU acts that allowed the burning of forest biomass (wood, branches, and bark) considered a renewable energy source. The applicants come from areas particularly affected by deforestation, such as the southeastern United States, Estonia, and the Carpathian region in Eastern Europe. Relying on the fact that biomass power plants emit more carbon into the atmosphere than coal-fired power plants, the applicants sought the annulment of EU acts related to forest biomass. Therefore, while the *Carvalho* case challenges EU legislation related to general goals regarding climate change regulation, the *Sabo* case contests a specific measure aimed at relying on biomass to achieve those goals [20].

Although the emphasis in the *Carvalho* and *Sabo* cases was on different elements, the argumentation in both cases is similar. In both cases, the applicants relied on Article 191 of the Treaty on the Functioning of the European Union (TFEU), which establishes that EU environmental policy should aim to achieve the following objectives: the preservation, protection, and improvement of the quality of the environment, the protection of human health, the prudent and rational use of natural resources, and the enhancement of measures at the international level to combat regional and global environmental protection issues, especially climate change. In both cases, the applicants argued that elements of the contested acts violated the fundamental treaties of the EU and the EU Charter of Fundamental Rights, which has the same legal value as the mentioned treaties.

Despite invoking a violation of fundamental rights, the Court of Justice was not convinced of the merits of the appellant's arguments. The Court of Justice reiterated its conclusion from the *Sabo* case in the *Carvalho* case: "[...] the claim that an act infringes fundamental rights is not sufficient in itself for it to be established that the action brought by an individual is admissible, without running the risk of rendering the requirements of the fourth paragraph of Article 263 TFEU meaningless." The Court of Justice considered that this would mean that *locus standi* is granted to everyone without distinction. [21]

This approach by the Court significantly hinders access to justice, especially in cases related to climate change. Climate change affects everyone, both present and future generations. However, in the *Codorníu* case, [22] the Court of Justice applied a broader approach. In this instance, the Court found that there is an individual concern because a personal right, the right to a trademark, was significantly harmed by the legislative act. It can be inferred that the Court's reasoning is that a personal right ranks higher than a universal fundamental right. Such logic from the Court appears to be debatable.

## INDIVIDUAL CONCERN

The decision of the Court of Justice in the *Plaumann* case has been criticized for favoring private interests at the expense of public ones. However, the Court of Justice continues to adhere to the formula established in this case, as we have seen in the *Carvalho* case. Therefore, it is necessary to examine how the criteria for establishing the existence of individual concern in the *Plaumann* case were developed.

In 1961, the Federal Republic of Germany requested the European Economic Community Commission's permission to partially suspend customs duties applied to tangerines and clementines imported from third countries. The Commission refused to grant the authorization, leading the applicant, an importer of clementines, to challenge the legality of the Commission's decision. Since the decision was not directly addressed to him, Mr. Plaumann had to prove his individual concern. However, the Court established that the applicant still lacked *locus standi*. In doing so, it developed a formula for determining the existence of individual concern that remains in force to this day. According to the decision in the Plaumann case: "Persons other than those to whom a decision is addressed may only claim to be individually concerned if that decision affects them by reason of certain attributes which are peculiar to them or by reason of circumstances in which they are differentiated from all other persons and by virtue of these factors distinguishes them individually just as in the case of the person addressed [23]." It is necessary that these characteristics and circumstances be permanent and decisive, distinguishing members of a particular group from others.

In the Plaumann case, the Court applied this reasoning, known as the Plaumann test, and determined that any person could, in theory, become an importer of clementines in the future, and Mr. Plaumann could not be distinguished from others. As a result, he was found to lack the individual concern necessary for standing to challenge the Commission's decision. In this regard, a distinction can be made between open and closed ("fixed") categories of applicants. A category may be considered open if membership in it was not fixed at the time of the decision. Conversely, if membership in a particular category is fixed at that moment, then such a category is closed. [24] In order to be recognized as having an individual concern, the complainants must prove that they belong to a group that cannot be expanded after the entry into force of a specific Community act. However, it is noted in the literature that the market reality of supply and demand implies that there is a natural existence of a certain number of firms that do not change drastically [25].

This test has since been widely used by the Court to assess whether individuals or entities have a sufficient individual concern to bring actions before the EU courts, and it has been criticized for its strict application, which has made it challenging for many to establish standing in environmental cases, including those related to climate change.

## CRITICISMS AND ATTEMPTS TO MODIFY THE PLAUMANN FORMULA

The Plaumann test has sparked a debate in academic literature, predominantly with a critical tone [26.] Calls for a modification of this formula have come not only from academic circles but also from courts within the Community. Here, we refer to the opinion of the Advocate General Jacobs in the case of Union of Small Agricultural Producers (UPA) v. Council [27] and the judgment of the Court of First Instance in the case of Jégo-Quére v. Commission [28].

In his opinion in the UPA case, [29] Advocate General Jacobs highlighted the procedural challenges faced by private individuals and suggested ways to overcome these obstacles. He primarily questioned the position of the ECJ that the individual's standing before the Court was justified considering the "complete system of legal remedies" established by the EC Treaty. According to the Court, the system is comprehensive because a Community act can be challenged either through an action under Article 230 of the EC Treaty or through a preliminary ruling procedure under Article 234 of the EC Treaty. However, Jacobs pointed out that when it comes to Community acts that do not require the implementation of executive measures by national authorities, such as the regulation challenged in this case, individual applicants are left without an act to challenge before national courts. The only way for individual applicants to initiate a preliminary ruling procedure, where they could request a decision on a preliminary question, is by knowingly violating the law. This leads to the paradoxical situation where individual applicants must break the law to access the Court. The essence of Jacobs's position is that a individual applicants who does not otherwise have *locus standi* for annulment proceedings cannot automatically overcome such an impossibility by challenging the act in a preliminary ruling procedure. Whether such a procedure will be initiated depends on the Member State, and it can simply decide not to do so. Therefore, an individual applicant is largely dependent on the national court, and the preliminary ruling procedure cannot be considered a guarantee of an effective legal remedy.

As the best solution that would not deviate from the Treaty but would depart from the previously unjustifiably strict practice, Jacobs proposes the introduction of a new test for determining standing.

According to this proposal, an individual possesses standing for the annulment of Community measures if, due to specific circumstances in which they find themselves, the measure has or could have a significant negative impact on their interests. This solution guarantees direct access to the Court, making it simpler, according to the Advocate General, and eliminates the possibility of denying justice. However, Jacobs also pointed out a potential downside to this solution, which is overburdening the ECJ with the number of cases. Nevertheless, Jacobs also notes that this should not be a problem, considering the existence of the General Court, which is competent for applications filed by individual applicants, and the lack of evidence that case overload has occurred in legal systems of Member States with a liberal approach to individual applicants' access to the court.

It is interesting that parallel to the proceedings in the UPA case, another case of interest for the procedural legitimacy of individual applicants was ongoing, namely the case of *Jégo-Quéré v. Commission*. In this case as well, it involved the challenge to a regulation by individual applicants who lacked an individual concern. What is significant is that the Court of First Instance decided to accept the opinion of the Advocate General and propose further relaxation of the Plaumann formula, that is, a liberalization of the access of individual applicants to the Court. Specifically, in this case, the General Court determined the following: " *[...] in order to ensure effective judicial protection for individuals, a natural or legal person is to be regarded as individually concerned by a Community measure of general application that concerns him directly if the measure in question affects his legal position, in a manner which is both definite and immediate, by restricting his rights or by imposing obligations on him. The number and position of other persons who are likewise affected by the measure, or who may be so, are of no relevance in that regard [30].*"

The applicant *Jégo-Quéré* met the criteria of the newly formulated test by the Court of First Instance, and the application was declared admissible. It is noticeable that, compared to the opinion of the Advocate General, the new test has a limited scope. It applies only to measures of general application, requiring that the measure in question restricts rights or imposes obligations. The way in which the contested measure affects the legal position of the applicant must be specific and direct, not just potential, as in the opinion of Advocate General Jacobs. This approach by the Court of First Instance indicates its inclination to render a judgment that would be approved by the ECJ. However, the ECJ did not accept the new test. When the UPA case came before the ECJ, it did not adopt the opinion of the Advocate General but insisted on the Plaumann formula [31]. The ECJ also overturned the judgment in the *Jégo-Quéré* case in the appeal proceedings initiated by the Commission [32]. In both cases, it was determined that any potential reform must first come from the member states themselves, rather than the Court. It turned out that the Court was not willing to deviate from the established practice based on the Plaumann formula.

## **PLAUMANN TEST IN CASES CONCERNING ENVIRONMENTAL PROTECTION**

The restrictiveness of the Plaumann test is evident in cases related to the annulment of measures concerning climate change. The *Greenpeace v. Commission* case is a well-known example that highlights the challenges in interpreting the criteria for individual concern in environmental protection cases [33]. In this case, the environmental protection non-governmental organization Greenpeace sought the annulment of the Commission's decision to secure funds for the construction of a power plant in the Canary Islands. The applicants argued that their specific interests in environmental protection should be considered sufficient to meet the requirements for filing a claim. Additionally, they contended that the traditional interpretation of Article 173(4) of the EC Treaty should be revised to account for the peculiarities of the environment. They pointed out that the need to protect the general interest is a crucial factor for specific judicial protection of the environment. They argued that in the field of environmental protection, interests are "by their nature, general and common, and the rights relating to these interests are more appropriately enjoyed potentially by a large number of individuals [34]." The general advocate Cosmas agreed with the applicants on this matter, stating the following in his opinion: "*For environmental protection is indeed a matter of general interest. Conservation of the environment is a legal interest theoretically shared by all natural persons; it thus has a communal dimension. Furthermore, the more significant is the intervention in or impingement on the environment, the greater is the number of persons affected thereby [35].*" It is noteworthy that the general advocate also pointed out that primary EU law establishes that environmental protection requirements must be integrated into the definition and implementation of other EU policies.

*The court did not respond at all to these positions of the general advocate on the special regime for environmental protection. Instead, it established that the rights related to environmental protection, invoked by the applicants, are "fully judicially protected," based on the preliminary ruling procedure before national courts. In addition, the court did not affirm that the interests of the applicants were of a public nature (unlike private economic interests for which the Plaumann test was designed). Instead, it stated that public interests, such as environmental protection, are by definition diffuse, and therefore non-governmental organizations cannot meet the requirement of a unique position regarding the contested act. The court made similar decisions in other cases related to environmental protection [36]. Based on this, we can conclude that there is a conflict of views between the European Court of Justice and environmental protection organizations regarding how to recognize the "special treatment" of rights related to environmental protection. According to the Court, this should be achieved through an effective system of environmental judicial protection at the national level. Environmental protection organizations, however, believe that an effective system should include a broader approach to EU institutions [37].*

## AARHUS CONVENTION

The EU ratified the Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters (commonly referred to as the Aarhus Convention) [38] of the United Nations Economic Commission for Europe (UNECE) in 2005, which had already entered into force in October 2001. Although the applicants did not explicitly invoke it, it should be noted that the Plaumann test is not in line with this convention. Before the adoption of the Aarhus Convention, and in connection with it, Regulation 1367/2006 on the application of the provisions of the Aarhus Convention to Community institutions and bodies, [39] there were no specific provisions regarding access to judicial review of acts of Community institutions concerning environmental protection. The aim of the Aarhus Convention is to strengthen the role of citizens and civil society organizations in environmental matters, based on the principles of participatory democracy. The three "pillars" of the Aarhus Convention, as they are commonly referred to, include the right to access to information on the environment from public authorities, the right of the public to participate in decisions of significance to the environment, and the right to legal protection, which pertains to the right of citizens to challenge if the first two mentioned rights are violated, known as the right of access to justice.

According to Article 9, paragraph 3 of this Convention, each contracting party must ensure that "members of the public have access to administrative or judicial procedures to challenge acts and omissions by private persons and public authorities which contravene provisions of its national law relating to the environment." In its reports from 2011 [40] and 2017, [41] the Compliance Committee of the Aarhus Convention determined that the criteria from the Plaumann test are too strict to meet the Convention's criteria because individuals cannot be individually concerned if a directive or regulation has an effect based on an objective legal or factual situation.

## CONCLUSION

As demonstrated by the cases of Carvalho and Sabo, the EU Court of Justice continues to refuse to adapt the Plaumann test and consider the reality of climate change. Its strict conditions for procedural standing present a significant obstacle both for individuals seeking to challenge EU acts of general application, even when human rights are at risk, and for environmental protection groups striving to represent the public interest before this Court. It was believed that this situation would change with the EU's accession to the Aarhus Convention and the adoption of a series of directives aimed at improving the position of environmental protection groups, but the decisions in the Carvalho and Sabo cases show that such hopes were in vain.

However, there are indications that there will be a revision of the Plaumann test in the near future. In 2020, in its effort to become the world's first "climate-neutral" continent, the EU raised its emissions reduction target from forty to fifty percent. It also announced new regulations to achieve an enhanced goal for the year 2030 and initiated the process of revising the Climate and Energy Framework of Action by 2030.

If, on the other hand, the EU Court of Justice maintains its restrictive interpretation of individual concern in cases related to environmental protection, there is a high possibility that individuals facing adverse effects of climate change will be left without a legal remedy for protection. This raises the question of whether such a situation aligns with the image of a pioneer in the fight against climate change that the EU aims to create for itself.

## REFERENCES

- [1] Court of Justice of the European Union, *Armando Carvalho and Others v European Parliament and Council of the European Union*, Judgment of the Court (Sixth Chamber) of 25 March 2021.
- [2] Consolidated version of the Treaty on European Union and the Treaty on the Functioning of the European Union; available at: <https://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:12012E/TXT:en:PDF>
- [3] For updates on the actions for annulment after the entry into force of the Lisbon Treaty, see. Čavoški, A. (2009). *Pravosudni sistem evropske unije u svetlu reformskog ugovora*, Strani pravni život, Vol. 1, pp.73-85.
- [4] In the further text: TFEU.
- [5] Case 25-62, *Plaumann & Co. v Commission of the European Economic Community*, Judgment of the Court of 15 July 1963.
- [6] General Court of the EU, Application under Article 263 TFEU, Case T-330/18, *Armando Ferrão Carvalho and Others v. The European Parliament and the Council*, May 24, 2018.
- [7] Mladenov, M., Prelević Plavšić S., Stapski T. (2022). Climate change from the perspective of the European Court of Human Rights, *International Review*, Vol.11, No.3-4, pp.118-122.
- [8] Urgenda Foundation (on behalf of 886 individuals) v The State of the Netherlands (Ministry of Infrastructure and the Environment), First instance decision, HA ZA 13-1396, C/09/456689, ECLI:NL: RBDHA:2015:7145, ILDC 2456 (NL 2015), 24th June 2015, Netherlands; The Hague; District Court
- [9] Winter, G. (2009). *Armando Carvalho and Others v. EU: Invoking Human Rights and the Paris Agreement for Better Climate Protection Legislation*, Cambridge University Press online, p.139.
- [10] Order of the General Court (Second Chamber), *Carvalho and Others v Parliament and Council*, Case T-330/18, Judgment of 8 May 2019.
- [11] Spasojević, Đ., Vlajnić, J. (2021). Normative Aspect of Polygraph Examination in Criminal Procedure and its Application Outside Criminal Procedure with Reference to Polygraph Examination of Candidates for Employment and Employees, *Employment, education and entrepreneurship*, pp.181-187.
- [12] Spasojević, Đ., Miladinović Bogovac, Ž. (2018). Maloletnici kao žrtve krivičnih dela učinjenih zloupotrebom računarske mreže, *Trendovi u poslovanju*, Sves.2, Br.12, pp.61-70.
- [13] Application, paras.174-198.
- [14] Vlajnić, J. (2022). Pravo naroda na samoopredeljenje u međunarodnom pravu, *Pravni fakultet, Univerzitet u Beogradu*.
- [15] European Law Blog: The CJEU dismissed the People's Climate Case as inadmissible: the limit of Plaumann is Plaumann; available at: <https://europeanlawblog.eu/2021/04/06/the-cjeu-dismissed-the-peoples-climate-case-as-inadmissible-the-limit-of-plaumann-is-plaumann/>
- [16] C-565/19 P - *Carvalho and Others v Parliament and Council*, paras. 11, 12.
- [17] Case C-565/19 P: Appeal brought on 23 July 2019 by Armando Carvalho and Others against the order of the General Court (Second Chamber) delivered on 8 May 2019 in Case T-330/18: *Carvalho and Others v Parliament and Council*, para. 21.
- [18] Case T-330/18, para.128, 33-34.
- [19] Order of the General Court (Fourth Chamber) of 6 May 2020, *Peter Sabo and Others v European Parliament and Council of the European Union*, Case T-141/19.
- [20] Hartman, J. (2022). Protecting Rights in Climate Change Litigation before European Courts; available at: [https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=3832674](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3832674)
- [21] Court of Justice of the European Union, Order of the Court (Eighth Chamber) of 14 January 2021, *Sabo and Others v Parliament and Council*, Case C-297/20 P, para.29.
- [22] Judgment of the Court of 18 May 1994, *Codorníu SA v Council of the European Union*, Case C-309/89
- [23] Judgment of the Court of 15 July 1963, *Plaumann & Co. v Commission of the European Economic Community*, Case 25-62, 107.
- [24] Hartley, T.C. (2007). *The Foundations of European Community Law: An Introduction to the Constitutional and Administrative Law of the European Community*, 6th edition, Oxford University Press, p.348.
- [25] Stratieva, N.; Eliantonio, M. (2010). From Plaumann, Through UPA and Jégo-Quéré, to the Lisbon Treaty: The Locus Standi of Private Applicants Under Article 230(4) EC Through a Political Lens, *RRDE*, p.3.
- [26] Ward, A. (2003). Locus Standi under Article 230 (4) of the EC Treaty: Crafting a Coherent Test for a 'Wobbly Polity', *Yearbook of European Law*, Vol.1, pp.45-77.
- [27] Judgment of the Court of 25 July 2002, *Unión de Pequeños Agricultores v Council of the European Union*, Case C-50/00 P.
- [28] Judgment of the Court (Sixth Chamber) of 1 April 2004, *Commission of the European Communities v Jégo-Quéré & Cie SA*, Case C-263/02 P.
- [29] Opinion of Mr Advocate General Jacobs delivered on 21 March 2002, *Unión de Pequeños Agricultores v Council of the European Union*, Case C-50/00 P.
- [30] Case C-263/02, para.51.
- [31] Case C-50/00, para.32.

- [32] Case C-263/02, paras. 29-39.
- [33] Case T-585, Stichting Greenpeace Council (Greenpeace International) and others v Commission of the European Communities, Order of the Court of First Instance (First Chamber) of 9 August 1995.
- [34] Case C-321/95 P, Stichting Greenpeace Council (Greenpeace International) and Others v Commission of the European Communities, Judgment of the Court of 2 April 1998., para.18.
- [35] Opinion of Mr Advocate General Cosmas delivered on 23 September 1997, Case C-321/95 P, para.102.
- [36] Order of the Court of First Instance (Second Chamber) of 28 November 2005, European Environmental Bureau (EEB) and Stichting Natuur en Milieu v Commission of the European Communities, Joined cases T-236/04 and T-241/04.
- [37] Pagano, M. (2019). Overcoming Plaumann in EU Environmental Litigation—An Analysis of ENGOs Legal Arguments in Actions for Annulment, *Diritto e Processo*, pp.311-360, p.320.
- [38] Convention on Access to Information, Public Participation in Decision-Making and Access to Justice in Environmental Matters, Aarhus, Denmark, 25 June 1998.
- [39] Regulation (EC) No 1367/2006 of the European Parliament and of the Council of 6 September 2006 on the application of the provisions of the Aarhus Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters to Community institutions and bodies, OJ L 264, 25.9.2006.
- [40] Findings and Recommendations of the Compliance Committee with regard to Communication ACCC/C/2008/32 (Part I) Concerning Compliance by the European Union, 14 April 2011; available at: <https://unece.org/DAM/env/pp/compliance/C2008-32/Findings/C32Findings27April2011.pdf>
- [41] Findings and Recommendations of the Compliance Committee with regard to Communication ACCC/C/2008/32 (Part II) Concerning Compliance by the European Union, 17 March 2017; available at: [https://unece.org/fileadmin/DAM/env/pp/compliance/C2008-32/Findings/C32\\_EU\\_Findings\\_as\\_adopted\\_advance\\_unedited\\_version.pdf](https://unece.org/fileadmin/DAM/env/pp/compliance/C2008-32/Findings/C32_EU_Findings_as_adopted_advance_unedited_version.pdf)

**Article history:**

Received 5 May 2022

Accepted 6 June 2022



## INSTRUCTION TO AUTHORS

**Paper Title** [Times New Roman 16, bold, left alignment, capitalize the first letter]

**FAMILY-NAME Name<sup>1</sup>, FAMILY-NAME Name<sup>2</sup>** [Times New Roman, 13-point, bold]

<sup>1</sup>Author Affiliation (COUNTRY) [9-point, italic]

<sup>2</sup>Author Affiliation (COUNTRY) [9-point, italic]

E-mails [9-point, italic, separated by comas]

**Abstract** [Times New Roman, 12-point, bold, left alignment]

This template will assist you in formatting your paper. Please, copy it on your computer and insert the text keeping the format and styles indicated. The various components of your paper (title, abstract, keywords, sections, text, etc.) are already defined on the style sheet, as illustrated by the portions given in this document.

Keywords: Innovation, technology, research projects, etc. [Times New Roman 9-point].

**Section** [Times New Roman, 12-point, bold, left alignment]

There is a limitation of 8/10 pages. All pages size should be A4.

The top, bottom, right, and left margins should be 2,5 cm. All the text must be in one column and Times New Roman font, including figures and tables, with single-spaced 10-point interline spacing.

**Subsection** [Times New Roman, 12 bold italic, left alignment, capitalize the first letter]

The text included in the sections or subsections must begin one line after the section or subsection title. Do not use hard tabs and limit the use of hard returns to one return at the end of a paragraph. Please, do not number manually the sections and subsections; the template will do it automatically.

*Sub-subsection: Guidelines for Abbreviations and Acronyms*

Define abbreviations and acronyms the first time they are used in the text, even after they have been defined in the abstract. Do not use abbreviations in the title or heads unless they are unavoidable.

*Sub-subsection: Guidelines for Figures and Tables*

Tables, figures, and graphics should be centred, numbered and accompanied by a legend. Figure captions should be below figures; table heads should appear above tables. Insert figures and tables after they are cited in the text. Use the abbreviation "Figure 1", even at the beginning of a sentence.

*Sub-subsection: Guidelines for Page numbers and Footnotes*

Please, do not add any kind of pagination anywhere in the paper. Avoid using headers and use footnotes only within the page margins (2,5 cm of white margins).

*Sub-subsection: Guidelines for References*

The list of the references should be given at the end of the paper. References are numbered in brackets by order of appearance in the document (e.g. [1], [2], [3]). The same reference can be cited more than once in the text with the same reference number.

**Section**

Use as many sections and subsections as you need (e.g. Introduction, Methodology, Results, Conclusions, etc.) and end the paper with the list of references.

**REFERENCES** [Times New Roman, 12-point, bold, left alignment]

[1]Einstein, A. (1916). General Theory of Relativity. Annalen der Physik 49(7), pp. 769-822

## LIST OF THE REVIEWERS

*Academician Professor Rajko Tomaš, PhD*, Faculty of Economics, Banja Luka, Bosnia and Herzegovina

*Academician Professor Slavko Karavidić, PhD*, Faculty of Business Economics and Entrepreneurship, Belgrade, Serbia

*Full Professor Carl Edwin Lindgren, PhD*, American School of Genealogy, Heraldry and Documentary Sciences, USA

*Full Professor Brenda Nelson-Porter, PhD*, Brigitte's Technology Consulting and Research Firm, USA

*Full Professor Ayinla Omolaja Muhammed, PhD*, International College of Management and Technology, Nigeria

*Full Professor Emine Demiray, PhD*, Anadolia University, Turkey

*Full Professor Nezameddin Faghieh, PhD*, Editor-In-Chief „Journal of Global Entrepreneurship Research “(JGER), Faculty of Entrepreneurship, University of Tehran, Iran

*Full Professor Radovan Pejanovic, PhD*, University of Novi Sad, Serbia

*Full Professor Radojko Lukić, PhD*, Faculty of Economics, University of Belgrade, Serbia

*Full Professor Snezhana Ilieva, PhD*, St. Kliment Ohridski University in Sofia, Bulgaria

*Full professor Rossitsa Chobanova, PhD*, Economic research institute, Bulgarian academy of sciences, Sofia, Bulgaria

*Full Professor Maja Cogoljević, PhD*, Faculty of Business Economics and Entrepreneurship, Belgrade, Serbia

*Full Professor Boufeldja Ghat, PhD*, Faculty of Social Sciences Oran University, Oran, Algeria

*Full Professor José G. Vargas-Hernández PhD*, University Center for Economic and Managerial Sciences, University of Guadalajara, Guadalajara, Jalisco, México

*Full Professor Ballet Jérôme, PhD*, Center of Ethocs and Economics for Environment and Development in Madagascar, University of Antananarivo, Madagascar

*Full Professor Sreten Miladinovski, PhD*, MIT University, Skopje, Former Yugoslav Republic Macedonia

*Full Professor Cane Capragoski, PhD*, MIT University, Skopje, The Former Yugoslav Republic Macedonia

*Full Professor N Sandhya, PhD*, Nagarjuna College of Engineering & Technology, India

*Full Professor Dragana Vojteški - Kljenak, PhD*, Faculty of Business Economics and Entrepreneurship, Belgrade, Serbia

*Full Professor Marijan Stevanovski, PhD*, MIT University, Skopje, Former Yugoslav Republic Macedonia

*Full Professor Edita Kastratović, PhD*, Faculty of Business Economics and Entrepreneurship, Belgrade, Serbia

*Full Professor Marija Čukanović Karavidić, PhD*, Ministry of Education, Science and Technological Development, Serbia

*Full Professor, Milan Krstić, PhD*, Faculty of Business Economics and Entrepreneurship, Belgrade, Serbia

*Full Professor Petar Spalević, PhD* Faculty of Technical Science Kosovska Mitrovica, University of Pristina in Kosovska Mitrovica, Kosovska Mitrovica, Serbia

*Full professor Slavoljub Šljivić, PhD*, Faculty of Business Economics and Entrepreneurship, Belgrade, Serbia

*Full Professor Vlado Radić, PhD*, Faculty of Business Economics and Entrepreneurship, Belgrade, Serbia

*Associate Professor Isiaka Esema, PhD*, Pebble Hills University and Coordinator of International Community Education Association, Nigeria Chapter, Nigeria

*Associate Professor Chee Seng, Leow, PhD*, IIC University of Technology, Cambodia

*Associate Professor Darko Vuković, PhD*, Tomsk Polytechnic University, Tomsk, Russia

*Associate Professor Ljiljana Tomic, PhD*, Faculty of Pharmacy, University of Bijeljina, Bosnia and Herzegovina

*Associate Professor Natalija Vuković, PhD*, Ural State Forest Engineering University, Yekaterinburg, Russia  
*Associate Professor Dragan Cvetković, PhD*, Faculty of Business Economics and Entrepreneurship, Belgrade, Serbia

*Associate Professor Boro Krstić, PhD*, Faculty of Agriculture, University of Bijeljina, Bosnia and Herzegovina

*Associate Professor Drazen Jovanovic, PhD*, Alfa BK University, Belgrade, Serbia

*Associate Professor Ljiljana Dimitrijević, PhD*, Faculty of Business Economics and Entrepreneurship, Belgrade, Serbia

*Associate Professor Vladimir Ristanović, PhD*, Institute of European Studies, Belgrade, Serbia

*Associate Professor Almir Peštek, PhD*, School of Economics and Business, Sarajevo, Bosnia and Herzegovina

*Associate Professor Sladjana Vujičić, PhD*, Faculty of Business Economics and Entrepreneurship, Belgrade, Serbia

*Associate Professor Milan Gavrilović, PhD*, Faculty of Business Economics and Entrepreneurship, Belgrade, Serbia

*Associate Professor Gordana Gavrić, PhD*, Faculty of Business Economics and Entrepreneurship, Belgrade, Serbia

*Assistant Professor Vladan Cogoljević*, Faculty of Business Economics and Entrepreneurship, Belgrade, Serbia

*Assistant Professor Raghu Bir Bista, PhD*, Professor, Tribhuvan University, Nepal

*Assistant Professor Sandro Nuno Ferreira de Serpa, PhD*, University of the Azores, Portugal

*Assistant Professor Muhammad Shoaib Farooq, PhD*, Universiti Malaysia Sarwak (UNIMAS), Malaysia

*Assistant Professor Agrawal Reena, PhD*, Jaipuria Institute of Management, Luckow, Uttar Pradesh, India

*Assistant Professor Dušan Marković, PhD*, Belgrade Business and Arts Academy of Applied Studies (BBAA), Belgrade, Serbia

*Assistant Professor Zélia Breda, PhD*, Department of Economics, Management and Industrial Engineering of the University of Aveiro, Aveiro, Portugal

*Assistant Professor Carmine D'Arconte, PhD*, Faculty of Economics, University of Rome Three, Italy

*Assistant Professor Neven Vidaković, PhD*, Zagreb School of Economics and Management, Croatia

*Assistant Professor Aidin Salamzadeh, PhD*, Faculty of Entrepreneurship, University of Tehran, Tehran, Iran

*Assistant professor Ahmed Rhif, PhD*, High Institute of Applied Sciences and Technologies (ISSAT Kairouan), Tunis

*Assistant professor Miroslav Nedeljkovic, PhD*, Institute of Agricultural Economics, Belgrade, Serbia

*Assistant Professor John Stocker, PhD*, University of Delaware Newark, USA

*Assistant Professor Tatjana Papić-Brankov, PhD*, Institute of Agricultural Economics, Belgrade, Serbia

*Assistant Professor Vladan Pantovic, PhD*, Faculty of Information Technology and Engineering Union University - Nikola Tesla, Belgrade, Serbia

*Assistant professor Mirjana Nikolic, PhD*, Faculty of Psychology, University of Bijeljina, Bosnia and Herzegovina

*Assistant Professor Biljana Dimitric, PhD*, Faculty of Psychology, University of Bijeljina, Bosnia and Herzegovina

*Hiroko Kawamorita Kesim*, Ondokuz Mayıs University, Turkey

