



[www.eras-conference.com](http://www.eras-conference.com)

# CONFERENCE PROCEEDINGS



9<sup>TH</sup> INTERNATIONAL SCIENTIFIC CONFERENCE  
ERAZ 2023

**KNOWLEDGE BASED  
SUSTAINABLE DEVELOPMENT**  
*Conference Proceedings*

Prague, Czech Republic  
June 1, 2023

**International Scientific Conference ERAZ – Knowledge Based Sustainable Development**

**ISSN 2683-5568**

**Conference Proceedings (part of ERAZ conference collection)**

**Editor:**


**Vuk Bevanda** 

PhD, Associate Professor, Faculty of Social Sciences, Belgrade, Serbia

**Associate Editors:**

**Paulo Monteiro Alexandre** 

PhD, Associate Professor, Polytechnic Institute of Setúbal, School of Business Administration, Setúbal, Portugal;

**Marko Tomljanovic** 

PhD, Assistant Professor, Department of International Economics, University of Rijeka,  
Faculty of Economics and Business, Rijeka, Croatia

**Organizational Committee:**

**Anton Vorina** 

PhD, Professor, School of Economics, Vocational College, Celje, Slovenia;

**Nikolina Vrcelj** 

PhD candidate, Udekom Balkan, Serbia;

**Nevena Bevanda**

PhD student, Udekom Balkan, Serbia;

**Ivana Mirčević**

BSc, Udekom Balkan, Serbia;

**Uroš Mirčević**

Ing., Udekom Balkan, Serbia;

**Goran Stevanović**

BSc, Udekom Balkan, Serbia

**Technical Editor:**

Branimir Trošić

**Published by:**

Association of Economists and Managers  
of the Balkans – **UdekoM Balkan**

Ustanicka 179/2 St. 11000 Belgrade, Serbia

office@udekom.org.rs

+381 62 8125 779

**Conference partners:**

Faculty of Logistics, University of Maribor, Maribor (Slovenia);

University of National and World Economy – UNWE, Sofia (Bulgaria);

Center for Political Research and Documentation (KEPET),

Research Laboratory of the Department of Political Science  
of University of Crete (Greece);

Institute of Public Finance – Zagreb (Croatia)

Faculty of Tourism and Hospitality Ohrid,

University of St. Kliment Ohridski from Bitola  
(North Macedonia)

**Cover image by:** Markéta Machová from Pixabay.

**Print circulation:** 100 copies

**Printed by:** SKRIPTA International, Belgrade, Serbia  
**Belgrade, 2024**

**ISBN 978-86-80194-72-1**

**ISSN 2683-5568**

**DOI:** <https://doi.org/10.31410/ERAZ.2023>

**Disclaimer:** The author(s) of each paper appearing in this publication is/are solely responsible for the content thereof; the findings, interpretations and conclusions expressed in the papers are those of the authors and do not reflect the view of the editor, reviewers, scientific committee members, the publisher, conference partners or anyone else involved in creating, producing or delivering this publication.



This work is licensed under a Creative Commons  
Attribution-NonCommercial 4.0 International License

CIP - Katalogizacija u publikaciji  
Narodna biblioteka Srbije, Beograd

330.34:502.131.1(082)

502.131.1(082)

005.94(082)

**INTERNATIONAL Scientific Conference Knowledge Based  
Sustainable Development ERAZ (9 ; 2023)**

Conference Proceedings / The 9th International Scientific  
Conference ERAZ 2023, Knowledge Based Sustainable  
Development, Prague, Czech Republic June 1, 2023 ; [editor Vuk  
Bevanda]. - Belgrade : Association of Economists and Managers  
of the Balkans, 2024 (Belgrade : Skripta International). - XXI, 588  
str. ; 24 cm. - (ERAZ Conference Collection, ISSN 2683-5568)

Tiraž 100. - Bibliografija uz svaki rad.

ISBN 978-86-80194-72-1

1. Bevanda, Vuk, 1977- [urednik]

a) Ekonomski razvoj -- Održivi razvoj -- Zbornici b) Znanje --  
Ekonomija -- Zbornici

COBISS.SR-ID 143165961

**Scientific (Program) Committee of the ERAZ conference:**

1. **Fatmir Memaj**   
PhD, Full-Time Professor, Department of Statistics and Applied Informatics, Deputy Dean at Faculty of Economics, University of Tirana, Albania
2. **Irma Shyle**   
PhD, Associate Professor, Polytechnic University of Tirana, Department of Production and Management, Tirana, Albania
3. **Almir Alihodžić**  
PhD, Associate Professor, University of Zenica, Faculty of Economics Zenica, Bosnia and Herzegovina
4. **Tanja Schuschnig**  
PhD, Associate Professor, Vice-Rector of Studies for Further Education, Department of Financial Management, Faculty of Management and Economics, University of Klagenfurt, Austria
5. **Gudrun Fritz-Schmied**  
PhD, Associate Professor, Department of Financial Management, Faculty of Management and Economics, University of Klagenfurt, Austria
6. **Christian Tanushev**   
PhD, Full-Time Professor, University of National and World Economy, Sofia, Bulgaria
7. **Tsvetana Stoyanova**   
PhD, Full-Time Professor, University of National and World Economy, Sofia, Bulgaria
8. **Diana Kopeva**   
PhD, Full-Time Professor, University of National and World Economy, Sofia, Bulgaria
9. **Silvia Trifonova**   
PhD, Full-Time Professor, University of National and World Economy, Sofia, Bulgaria
10. **Georgi Zabunov**   
PhD, Associate Professor, University of National and World Economy, Sofia, Bulgaria
11. **Hristina Oreshkova**   
PhD, Associate Professor, University of National and World Economy, Sofia, Bulgaria
12. **Dragomir Stefanov**   
PhD, Associate Professor, University of National and World Economy, Sofia, Bulgaria
13. **Svilen Kolev**   
PhD, Assistant Professor, University of National and World Economy, Sofia, Bulgaria
14. **Yanko Hristozov**   
PhD, Assistant Professor, University of National and World Economy, Sofia, Bulgaria
15. **Suzana Marković**   
PhD, Full-Time Professor, University of Rijeka, Faculty of Tourism and Hospitality Management, Opatija, Croatia
16. **Alžbeta Királková**   
PhD, Associate Professor, AMBIS University, Prague, Czech Republic
17. **Jiří Strouhal**   
PhD, Full-Time Professor, Department of Finance and Accounting, Skoda Auto University, Mladá Boleslav, Czech Republic
18. **Aleš Pachmann**   
PhD, Associate Professor, AMBIS University, Prague, Czech Republic
19. **Josef Polák**   
PhD, Associate Professor, AMBIS University, Prague, Czech Republic
20. **Nikos Papadakis**   
PhD, Professor, Head of the Department of Political Science, University of Crete, Crete, Greece
21. **Ivi Mavromoustakou**   
PhD, Professor, Department of Political Science, University of Crete, Crete, Greece
22. **Costantine Manasakis**   
PhD, Associate Professor, Department of Political Science, University of Crete, Crete, Greece
23. **Gregory Koronakos**   
PhD, Professor, University of Piraeus, Department of Informatics, Decision Support Systems Laboratory, Greece
24. **Maria Lakatos**  
PhD, Associate Professor, Department of Finance and Accounting, Faculty of Economics and Business, University of János Neumann, Kecskemét, Hungary
25. **Éva Erdélyi**   
PhD, Associate Professor, Faculty of Commerce, Hospitality and Tourism, Budapest Business School, University of Applied Sciences, Budapest, Hungary
26. **Cheryl Venan Dias**   
PhD, Assistant Professor, Department of Tourism Studies, S.S. Dempo College of Commerce and Economics, Goa, India
27. **Ubaldo Comite**   
PhD, Associate Professor, Faculty of Economy, University Giustino Fortunato, Benevento, Italy
28. **Annalisa Baldissera**   
PhD, Associate Professor, University of Brescia, Business Economics, Brescia, Italy
29. **Marco Taliento**   
PhD, Associate Professor, University of Foggia, Foggia, Italy
30. **Milen Filipov**   
PhD, Assistant Professor, KIMEP University, Almaty, Kazakhstan
31. **Snezhana Dichevska**   
PhD, Full-Time Professor, Dean of the Faculty of Tourism and Hospitality – Ohrid, University of “St. Kliment Ohridski – Bitola”, North Macedonia
32. **Aleksandar Trajkov**   
PhD, Full-Time Professor, Head of the Center for Scientific Research at the Faculty of Tourism and Hospitality – Ohrid, University of “St. Kliment Ohridski – Bitola”, North Macedonia

33. **Risto B. Rechkoski**   
PhD, Full-Time Professor, Faculty of Tourism and Hospitality – Ohrid,  
University of “St. Kliment Ohridski” – Bitola, North Macedonia
34. **Vera Karadzova**   
PhD, Full-Time Professor, Faculty of Tourism and Hospitality – Ohrid,  
University of “St. Kliment Ohridski – Bitola”, North Macedonia
35. **Bojan Srbinoski**   
PhD, Assistant Professor, Faculty of Tourism and Hospitality – Ohrid,  
University of St. Kliment Ohridski – Bitola, North Macedonia
36. **Sasho Kjosev**   
PhD, Full-Time Professor, Faculty of Economics, University “Ss. Cyril and Methodius”, Skopje, North Macedonia
37. **Karolina Olszewska**   
PhD, Assistant Professor, Faculty of Social Sciences, Institute of International Studies,  
Wroclaw University of Economics and Business, Wroclaw, Poland
38. **Andrzej Sztando**   
PhD, Associate Professor, Department of Spatial Economy and Self-Governed Administration,  
Wroclaw University of Economics and Business, Wroclaw, Poland
39. **Rui Dias**   
PhD, Associate Professor, Polytechnic Institute of Setúbal,  
School of Business Administration and Researcher at the University of Évora (CEFAGE), Setúbal, Portugal
40. **Paula Heliodoro**   
PhD, Associate Professor, Polytechnic Institute of Setubal, Setubal, Portugal
41. **Rocsana Manea Tonis**   
PhD, Associate Professor, National University of Physical Education and Sport, Bucharest, Romania
42. **Zobova Ludmila L.**   
PhD, Full-Time Professor, Institute of Economics, Kemerovo State University, Kemerovo, Russia
43. **Rabab Ali Abumalloh**  
PhD, Assistant Professor, Imam Abdulrahman Bin Faisal University, Al-Dammam, Saudi Arabia
44. **Dejan Spasić**   
PhD, Full-Time Professor, Faculty of Economics, University of Niš, Serbia
45. **Sanja Jelisavac Trošić**   
PhD, Senior Research Fellow, Institute of International Politics and Economics, Belgrade, Serbia
46. **Dobriša Lukić**  
PhD, Research Associate, “Jovan Cvijić” Geographical Institute of the Serbian Academy of Sciences and Arts,  
Belgrade, Serbia
47. **Anton Manfreda**   
PhD, Assistant Professor, Faculty of Economics, University of Ljubljana, Slovenia
48. **Eva Podovševnik**   
PhD, Associate Professor, University of Primorska, Faculty of Tourism Studies Turistica, Portorož, Slovenia
49. **Lubica Hurbánková**   
PhD, Assistant Professor, Department of Statistics at the University of Economics in Bratislava, Slovakia
45. **Dana Országhová**   
PhD, Associate Professor, Institute of Statistics, Operations Research and Mathematics,  
Faculty of Economics and Management, Slovak University of Agriculture in Nitra, Slovakia
51. **Maria del Carmen Valls Martínez**   
PhD, Professor, Department of Economics and Business, University of Almería, Spain
52. **Vanesa Sánchez Ballesteros**   
PhD, Professor, University of Jaén, Spain
53. **Erhan İřcan**   
PhD, Assistant Professor, Department of Economics, Cukurova University, Adana, Turkey
54. **Nadiia Kobetska**  
PhD, Full-Time Professor, Law Institute, Vasyl Stefanyk Precarpathian National University, Ukraine,  
Ivno-Frankivsk, Ukraine
55. **Lyudmila Batsenko**   
PhD, Assistant Professor, Sumy National Agrarian University, Sumy, Ukraine
56. **Ana Bogdanović**   
PhD, Associate Professor, Newcastle University Business School, Newcastle upon Tyne, United Kingdom



## Contents

<b>Index of Authors</b> .....	<b>XI</b>
<b>Index</b> .....	<b>XIII</b>
<b>Preface</b> .....	<b>XVII</b>
<b>ERAZ 2023 Participants' Affiliation</b> .....	<b>XIX</b>
<b>Sustainable Development in the World of Lies</b> .....	<b>1</b>
Kristián Čechmánek	
<b>Sustainable Development Management and Its Role in the Organizations</b> .....	<b>9</b>
Andreea Grecu	
<b>Implementation of Sustainable Development Goals in European and Western Balkans Countries</b> .....	<b>17</b>
Velibor Jovanović Gavrilović	
<b>Factors Determining Inflation in the American Economy: A Quantitative Analysis</b> .....	<b>27</b>
Tsvetomir Tsvetkov Irina Atanasova	
<b>Small and Medium-Sized Businesses in Albania Prefer Progressive Tax or Flat Tax</b> .....	<b>37</b>
Mimoza Zeneli Almarin Frakulli	
<b>Renewable Energy Financing during the COVID-19 Pandemic: Obstacles and Solutions</b> .....	<b>43</b>
Mert Topcu	
<b>Clean Energy Stock Indexes: Trends, Fluctuations, and Implications for Investors</b> .....	<b>49</b>
Mariana Chambino Rui Dias Cristina Morais da Palma	
<b>Will There Be Dependencies between Oil Prices and Clean Energy Indexes?</b> .....	<b>57</b>
Mariana Chambino Rui Dias Cristina Morais da Palma	
<b>Cryptocurrency Market: Overreaction to News and Herd Instincts</b> .....	<b>67</b>
Rui Dias Mariana Chambino Cristina Morais da Palma	
<b>The Impact of the Economic, Energy Crisis and the Geopolitical Context on the Price of Construction</b> .....	<b>77</b>
Mircea-Sebastian Mancia Gabriela A. Popoviciu Aurora Mancia	
<b>Chaotic Economic Growth and Investment in Unmanned Aerial Systems: China and Russia</b> .....	<b>83</b>
Vesna Jablanovic	
<b>Contemporary Priorities in the Development of the General Agricultural Policy of the European Union</b> .....	<b>89</b>
Krassimira Zagorova	
<b>The Effectiveness of the Albanian Monetary Policy</b> .....	<b>97</b>
Evis Kumi	
<b>The Influence of Economic Activity on Income in the Regions of the Slovak Republic</b> .....	<b>103</b>
Mária Vojtková	
<b>Trend Analysis of the Employment Rate in Slovakia Regions in the Period 2013–2022</b> .....	<b>111</b>
Ľubica Hurbánková	

<b>The Qualification and Educational Level of Workforce as Employment Factor: Case Study in Nitra Region of Slovakia .....</b>	<b>119</b>
Dana Országhová Martina Chlebcová	
<b>Empowering Romanian Entrepreneurs to Develop Social Business .....</b>	<b>129</b>
Oana Staiculescu	
<b>The “Black Swan” Is “Green”: The Role of the Financial Sector in the Green Transition .....</b>	<b>139</b>
Daniela Bobeva	
<b>Risk Disclosures Related to Credit Derivative Use by U.S. and German Corporate Bond Funds between 2004 and 2010 – An Evaluation .....</b>	<b>147</b>
Dominika P. Gałkiewicz	
<b>Internal Audit as a Quality Assurance Instrument: A Case Study from Garment Manufacturing Enterprises in the Western Balkan Region.....</b>	<b>155</b>
Jolta Kacani Sajmira Kopani	
<b>Customs Performance Measurement – the Evidence from North Macedonia.....</b>	<b>163</b>
Danijela Miloshoska	
<b>How Innovation Drives Firm Performance in the Post COVID-19 Pandemic? .....</b>	<b>171</b>
Brunilda Kosta	
<b>Participative Management in the Framework of a Local Action Group .....</b>	<b>181</b>
Manuela Panaitescu	
<b>On the Relationship between ISO Standards and the Logistic Performance Index .....</b>	<b>189</b>
Enriko Ceko	
<b>Current Challenges Affecting the Development of Human Resources in Slovakia .....</b>	<b>201</b>
Iveta Dudová Silvia Matúšová	
<b>Slovak Self-Government’S Gender Policy.....</b>	<b>211</b>
Dagmar Petrušová Jana Sochuľáková Katarína Kráľová	
<b>The Importance of R&amp;D Projects in Serbia – The Role of Human Capital .....</b>	<b>219</b>
Aleksandra Pavlović Ivana Janjić	
<b>Human Strivings, between Social Change and Lifelong Learning .....</b>	<b>227</b>
Mirela Cristiana Nilă Stratone	
<b>The Emotional Intelligence of the Leader – Is It a Must? .....</b>	<b>237</b>
Silvena Yordanova	
<b>Innovative Careers Ahead: Adapting to New Occupations and Competencies in the Future Workforce .....</b>	<b>241</b>
Anton Vorina Nikolina Vrcelj Vuk Bevanda	
<b>The Risks of Quiet Quitting: Exploring the Impact of Telework on Employee Psychological Departure.....</b>	<b>249</b>
Dusana Alshatti Schmidt Matus Barath	
<b>Relationship between Hierarchical Values of Professional Activities and Theoretical and Practical Knowledge .....</b>	<b>257</b>
Valentina Vukosavljevic Pavlovic	



<b>Financial Market Knowledge of the Young Generation: An Empirical Analysis of European Students .....</b>	<b>267</b>
Dominika P. Gałkiewicz Mario Situm Lukas Hartleif	
<b>Contradictions of Sustainability Teaching Accounting in Higher Education in Bulgaria .....</b>	<b>275</b>
Kalin Kalev	
<b>Exploring the Universities' Resilience in Times of Crisis by Reporting to the Pattern of the National Culture .....</b>	<b>281</b>
Dragoş Valentin Dincă Cristina Elena Nicolescu Ionuţ Bogdan Berceanu	
<b>Factors Associated with Self-Perceived Health Status in the Slovak Republic.....</b>	<b>291</b>
Viera Labudová	
<b>From Awareness to Action: How Social Media Users Respond to Femicide Cases .....</b>	<b>299</b>
Gjorgjina Sherovska	
<b>Determining the Correlation between the RLAH Regime and Roaming Usage by Applying Business Intelligence .....</b>	<b>305</b>
Lovre Dodig Ljerka Luic	
<b>Identification and Role of Ethical Consumer Behaviour in the Overall Marketing Strategy.....</b>	<b>311</b>
Nadezhda Dimova	
<b>Impact of the Country of Origin on Pharmaceutical Products in the Albanian Market .....</b>	<b>315</b>
Irma Shyle	
<b>Understanding Regenerative Tourism as a Catalyst for Sustainable Economies: An Analysis of Selected Practices.....</b>	<b>325</b>
Marlene Amorim Marta Ferreira Dias Filipa Brandão Raquel Castro Madureira Rui Costa Zélia Breda Cristina Guardado Marcela Lopes Bruna Pedro	
<b>An Overview of Foreign Direct Investments in Tourism and Hospitality Industry.....</b>	<b>335</b>
Elvis Mujačević	
<b>Development of a Tourist Experience Model with the Aim of Increasing Economic Efficiency – On the Example of the Destination Sofia .....</b>	<b>345</b>
Irena Emilova Margarita Misheva Violeta Doneva-Yankulova	
<b>Digital Experience Scale Development: An Application in Rural Heritage Tourism.....</b>	<b>357</b>
Suzana Marković Sanja Raspor Janković	
<b>Sustainable Development of Spa Tourism through the Mobilization of Local Resources .....</b>	<b>367</b>
Boban Đurović	

<b>Possibility of Application of the Triple Helix Model with the Aim of Sustainable Development of Republic of Srpska's Spa .....</b>	<b>375</b>
Vesna Novakovic Sanel Jakupovic	
<b>Analysis of Stay of Cruise Ships in the Port of Kotor .....</b>	<b>383</b>
Nikola Konjević Sava Popović	
<b>Paleontological Tourism in the Cold World as a Promising Direction of the Arctic Tourism Development .....</b>	<b>393</b>
Ekaterina Romanova Liudmila Zamorshchikova	
<b>The Employment of Standardized Recipes, an Essential Prerequisite for Consistent Quality of the Culinary Product .....</b>	<b>401</b>
Kliment Naumov	
<b>Migration Movement of the Bulgarian Population and Socio-Economic Effects under the Pressure of an Increased Refugee Flow .....</b>	<b>411</b>
Kristina Petrova-Hristova	
<b>Efficiency of Agricultural Soil Withdrawals – Case of Slovakia .....</b>	<b>417</b>
Lucia Pašová Dominika Čeryová Zina Machničová	
<b>Climate Change Impact on Agricultural Production .....</b>	<b>429</b>
Slave Camelia Man Carmen Mihaela	
<b>Climate Change Impact on Financial Reporting – A Theoretical Approach .....</b>	<b>435</b>
Almina Manoku	
<b>Water and Air Purification Technologies and Equipment in the Sustainable National Development Context .....</b>	<b>445</b>
Nicoleta Rotariu Cristian Silviu Simionescu	
<b>Africa, Water and Climate Change .....</b>	<b>455</b>
Ciprian-Beniamin Benea Adina Sacara Onita Andra-Teodora Porumb	
<b>Decarbonization Initiatives among Leading Power Utility Players .....</b>	<b>463</b>
Vlado Georgievski Nevenka Kiteva Rogleva	
<b>Trends in Hydrogen Production Projects for Energy and Climate Purposes – A Descriptive Analysis of the IEA Database .....</b>	<b>475</b>
Elena Ocenic	
<b>Tourism Impacts on the Air, Light and Noise Pollution .....</b>	<b>481</b>
Lejla Žunić	
<b>Some Alternative Strategies Applied to Brewery Spent Grains for the Development of Sustainable Recycling Solutions in the Agro-Food Industry .....</b>	<b>493</b>
Luljeta Pinguli Ilirjan Malollari	
<b>The Recognition of the Right to a Healthy and Protected Environment in Europe and Romania .....</b>	<b>501</b>
Gabriela A. Popoviciu Mircea-Sebastian Mancia Emanuela-Iulia Dragomir Iuliu-Cristian Dragomir	

<b>Short Considerations Regarding the European and Romanian Legislation on the Recovery of Municipal and Similar Waste in Energy Recovery Incineration Plants .....</b>	<b>513</b>
Cliza Marta-Claudia Spataru-Negura Laura-Cristiana	
<b>Corporate Fraud and Liability Provisions in Albania .....</b>	<b>525</b>
Ledja Burnazi Mitllari	
<b>Role of Courts in Whistleblowers Protection in the Czech Republic .....</b>	<b>535</b>
Aleš Pachmann	
<b>The Methods of Hard Power and Soft Power in International Law.....</b>	<b>543</b>
Azam Korbayram Elif Hoca	
<b>The Role of Criminal Psychology in Albania’s Criminal Justice System .....</b>	<b>549</b>
Ivas Konini	
<b>Earth-Fault Detection Using Fuzzy Logic in Electrical Distribution Networks.....</b>	<b>559</b>
Razvan Moise	
<b>Comparison of Two Nitrite UV-VIS Spectrophotometric Analysis Methods in Meat Processed Product .....</b>	<b>567</b>
Ilirjana Boci	
<b>Assessing the Impacts of Price Controls on Emerging Markets: Evidence from Tirana City, Albania .....</b>	<b>575</b>
Brunela Trebicka Azeta Tartaraj	
<b>Marketing of the Territory of Tirana City, Albania: Strategies for Economic Development and Tourism Promotion.....</b>	<b>583</b>
Azeta Tartaraj Brunela Trebicka	





## Index of Authors

### A

Adina Sacara Onita, 455  
Aleksandra Pavlović, 219  
Aleš Pachmann, 535  
Almarin Frakulli, 37  
Almina Manoku, 435  
Andra-Teodora Porumb, 455  
Andreea Grecu, 9  
Anton Vorina, 241  
Aurora Mancian, 77  
Azam Korbayram, 543  
Azeta Tartaraj, 575; 583

### B

Boban Đurović, 367  
Bruna Pedro, 325  
Brunela Trebicka, 575; 583  
Brunilda Kosta, 171

### C

Ciprian-Beniamin Benea, 455  
Cliza Marta-Claudia, 513  
Cristian Silviu Simionescu, 445  
Cristina Elena Nicolescu, 281  
Cristina Guardado, 325  
Cristina Morais da Palma, 49;  
57; 67

### D

Dagmar Petrušová, 211  
Dana Országhová, 119  
Daniela Bobeva, 139  
Danijela Miloshoska, 163  
Dominika Čeryová, 417  
Dominika P. Gałkiewicz, 147;  
267  
Dragoş Valentin Dincă, 281  
Dusana Alshatti Schmidt, 249

### E

Ekaterina Romanova, 393  
Elena Ocenic, 475  
Elif Hoca, 543  
Elvis Mujačević, 335  
Emanuela-Iulia Dragomir, 501  
Enriko Ceko, 189

Evis Kumi, 97

### F

Filipa Brandão, 325

### G

Gabriela A. Popoviciu, 77; 501  
Gjorgjina Sherovska, 299

### I

Iilrijana Boci, 567  
Iilrjan Malollari, 493  
Ionuţ Bogdan Berceanu, 281  
Irena Emilova, 345  
Irina Atanasova, 27  
Irma Shyle, 315  
Iuliu-Cristian Dragomir, 501  
Ivana Janjić, 219  
Ivas Konini, 549  
Iveta Dudová, 201

### J

Jana Sochul'áková, 211  
Jolta Kacani, 155

### K

Kalin Kaley, 275  
Katarína Kráľová, 211  
Kliment Naumov, 401  
Krassimira Zagorova, 89  
Kristián Čechmánek, 1  
Kristina Petrova-Hristova, 411

### L

Ledja Burnazi Mitllari, 525  
Lejla Žunić, 481  
Liudmila Zamorshchikova, 393  
Lovre Dodig, 305  
Eubica Hurbánková, 111  
Lucia Pašová, 417  
Lukas Hartleif, 267  
Luljeta Pinguli, 493

### LJ

Ljerka Luic, 305

### M

Man Carmen Mihaela, 429  
Manuela Panaitescu, 181  
Marcela Lopes, 325  
Margarita Misheva, 345  
Mariana Chambino, 49; 57; 67  
Mária Vojtková, 103  
Mario Situm, 267  
Marlene Amorim, 325  
Marta Ferreira Dias, 325  
Martina Chlebcová, 119  
Matus Barath, 249  
Mert Topcu, 43  
Mimoza Zeneli, 37  
Mircea-Sebastian Mancian, 77;  
501  
Mirela Cristiana Nilă Stratone,  
227

### N

Nadezhda Dimova, 311  
Nevenka Kiteva Rogleva, 463  
Nicoleta Rotariu, 445  
Nikola Konjević, 383  
Nikolina Vrcelj, 241

### O

Oana Staiculescu, 129

### R

Raquel Castro Madureira, 325  
Razvan Moise, 559  
Rui Costa, 325  
Rui Dias, 49; 57; 67

### S

Sajmira Kopani, 155  
Sanel Jakupovic, 375  
Sanja Raspor Janković, 357  
Sava Popović, 383  
Silvena Yordanova, 237  
Silvia Matúšová, 201  
Slave Camelia, 429  
Spataru-Negura Laura-  
Cristiana, 513  
Suzana Marković, 357

**T**

Tsvetomir Tsvetkov, 27

**V**

Valentina Vukosavljevic  
Pavlovic, 257

Velibor Jovanović Gavrilović,  
17

Vesna Jablanovic, 83

Vesna Novakovic, 375

Viera Labudová, 291

Violeta Doneva-Yankulova,  
345

Vlado Georgievski, 463

Vuk Bevanda, 241

**Z**

Zélia Breda, 325

Zina Machničová, 417



## Index

### A

Access to water, 455  
Accounting, 275  
Admittance method, 559  
Adriatic Sea, 383  
Agricultural land withdrawals, 417  
Air-light-noise pollution, 481  
Albania, 315; 549  
Albania Company Law, 525  
Analysis of variance, 103  
"Anthropocene Era", 445

### B

Bay of Kotor, 383  
Big data, 305  
Brewer's spent grain (BSG), 493  
Business intelligence, 305  
By-products, 493

### C

Calibration curves, 567  
Chaos, 83  
Circular garments, 155  
Clean energy stock index, 49  
Clean energy stocks, 57  
Clean environment, 501  
Climate change, 435; 429  
CO<sub>2</sub> reduction, 463  
Collective security, 543  
Colonial inheritance, 455  
Common Agricultural Policy, 89  
Communities, 325  
Composite SDG index, 17  
Contemporary priorities, 89  
Control environment, 155  
Corporate fraud, 525  
Country of origin, 315  
Courts, 535  
COVID-19, 43; 171  
Credit default swap, 147  
Criminal proceedings, 549  
Criminal psychology, 549  
Croatian mobile users, 305

Crops, 429  
Cruise tourism, 383  
Cryptocurrency, 67  
Customs administration, 163

### D

Dams, 455  
Decarbonization, 463  
Decision making, 181  
Demographic situation, 411  
Derivative, 147  
Destination, 345  
Development, 129; 345  
Digital experience dimensions, 357  
Digitalization, 375  
Digital transformation, 201  
Disclosure, 147  
Disengagement, 249  
Disinformation, 1  
District, 119

### E

Earth-fault detection, 559  
Economic activity, 103  
Economic and energetic crises, 77  
Economic development, 583  
Economic efficiency, 345  
Economic growth, 83; 97; 575  
Educational structure, 119  
Emotional control, 237  
Emotional intelligence, 237  
Empathy, 237  
Employment, 119  
Energy, 513  
Energy and climate, 475  
Entrepreneurs, 129  
Environmental policies, 501  
Environmental protection, 445  
Equivalent disposable income, 103  
ESG, 139  
Ethical consumer behavior, 311  
European Agriculture  
Guarantee Fund, 89

European Union, 17; 89; 429  
EU-SILC, 103; 291  
Events for 2020 and 2022, 49  
Experience measurement, 357  
Experiences, 345  
Expert systems, 559

### F

Femicide, 299  
Financial literacy, 267  
Financial markets, 267  
Financial Reporting Standards, 435  
Firm performance, 171  
Fiscal legislation, 37  
Fiscal stimulus, 27  
Fiscal sustainability, 575  
Flat tax, 37  
Food consistency, 401  
Food quality, 401  
Foreign direct investments, 335  
Forensic psychologist, 549  
Fund, 147  
Future competencies, 241  
Fuzzy logic, 559

### G

Gender politics, 211  
Geopolitics context, 77  
Green finance, 139  
Green transition, 139

### H

Hedge, 57  
Hofstede's model of national culture, 281  
Human capital, 201; 219  
Human resources, 201  
Human strivings, 227  
Hydrogen production, 475

### I

Identification, 311  
IEA database, 475  
Impacts, 481  
Incineration plants, 513

Incomes, 37  
Inflation, 27  
Innovation, 171  
Innovative career, 241  
Instruments, 267  
Interest rates, 97  
Internal audit, 155  
Intervention, 543  
Investment in Unmanned  
Aerial Systems, 83  
ISO standards, 189

## J

Job creation, 335  
Justice system, 549

## K

Key performance indicators,  
163  
Knowledge, 1; 267  
Knowledge economy, 201

## A

Labour market, 119  
Leadership, 9; 237  
Leverage, 147  
Liability, 525  
Lies, 1  
Lifelong learning, 227  
Literacy, 267  
Living world, 481  
Logistic regression, 291  
Logistics, 189

## M

Macedonian customs, 163  
Mammoth fauna, 393  
Management, 181; 375  
Managerial structure, 257  
Market, 311  
Market failures, 27  
Marketing, 299; 583  
Marketing culture, 299  
Marketing strategy, 311  
Mean reversion, 67  
Measuring progress, 17  
Migrations, 411  
Mobile services, 305

Model, 345  
Monetary policy, 97  
Multivariate linear regression,  
219  
Municipal waste, 513

## N

Natural increase, 411  
Net-zero strategy, 463  
New occupation, 241  
Nitrite analysis, 567  
Non financial information, 435

## O

Oil prices, 57  
Open innovation, 375  
Organizational culture, 9  
Overreaction, 67

## P

Paleontological tourism, 393  
Participative behavior, 181  
Pedagogy of the self, 227  
Performance measurement, 163  
Persistence in returns, 49  
Petersen coil, 559  
Pharmaceutical industry, 315  
Population, 455  
Portfolio diversification, 49; 57  
Portugal, 325  
Power utilities, 463  
Pretreatment methods, 493  
Price controls, 575  
Price of constructions, 77  
Price stability, 97  
Production, 429  
Professional activities, 257  
Professional knowledge, 257  
Progressive tax, 37  
Protection, 535  
Protection of agricultural soil,  
417  
Public expenditure, 281  
Purchase decision, 315

## Q

Quality, 315  
Quality management, 189

Quality standards, 155  
Quiet quitting, 249

## R

R&D projects investment, 219  
Recovery, 513; 567  
Recovery and recycle, 493  
Refugees, 411  
Regenerative practices, 325  
Regenerative tourism, 325  
Region, 119  
Regulatory environment, 575  
Renewable energy financing,  
43  
Reporting, 147  
Right to a healthy and  
protected environment, 501  
Roaming like at home, 305  
Romania, 513  
Rural heritage tourism, 357

## S

Scale development, 357  
Self-governing region, 211  
Self-government, 211  
Self-perceived health, 291  
Self-reinforced, 275  
Serbia, 219  
Slovakia regions, 111  
SME, 37  
Social business, 129  
Social change, 227  
Social media marketing, 299  
Social safety nets, 575  
Sofia, 345  
Soft skills, 275  
Spa destinations, 367  
Spa tourism, 367  
Spectrophotometry methods,  
567  
Stabilization, 493  
Standardized recipes, 401  
Structural imbalances, 27  
Substantial gastronomic  
product, 401  
Supply chain management, 189  
Supply contraction, 27  
Surfaces, 429



Survey, 267  
Sustainability, 1; 275; 325  
Sustainable agriculture, 417  
Sustainable development, 1;  
367; 445  
Sustainable Development  
Goals, 1; 17  
Sustainable development  
management, 9  
Sustainable tourism, 367

**T**

Teaching, 275  
Telework, 249  
Teleworker, 249  
Territory, 583  
The employment rate, 111  
The EU universities' resilience,  
281  
The Triple helix model, 375  
Tirana City, 583  
Tourism, 335; 481  
Tourism promotion, 583  
Transit cruise port, 383  
Transport, 189

**U**

United Nations, 543  
United States, 27

**W**

Water stress, 455  
Western Balkans, 17  
Whistleblower, 535  
Workforce, 119

**Y**

Yakutia, 393

**Z**

Zone of permafrost, 393





## Preface

Economic development refers to enhancing economic activities in a society, resulting in positive changes in both the socio-economic structure and living standards. Sustainable economic development aims to eradicate poverty, inequality, and unemployment, ultimately promoting social inclusion and improving the overall quality of life. Consequently, analyzing this crucial issue requires a highly interdisciplinary approach.

The issue of sustainable economic development has gained recognition and attention from esteemed academic institutions in the Balkans region and beyond. Notably, Faculty of Logistics, University of Maribor, Maribor (Slovenia); University of National and World Economy - UNWE, Sofia (Bulgaria); Center for Political Research and Documentation (KEPET), Research Laboratory of the Department of Political Science of University of Crete (Greece); Institute of Public Finance - Zagreb (Croatia); Faculty of Tourism and Hospitality Ohrid, University of St. Kliment Ohridski from Bitola (North Macedonia) along with the Association of Economists and Managers of the Balkans have recognized the following issue and organized the 9<sup>th</sup> International Scientific Conference titled: ***Knowledge Based Sustainable Development – ERAZ 2023*** in Prague, Czech Republic on June 1, 2023 in a hybrid format (in-person, online and virtually).

The primary aim of the conference was to facilitate the gathering of the academic community, including experts, scientists, engineers, researchers, students, and other interested parties, with the purpose of disseminating scientific knowledge and promoting personal and collective growth. To achieve this goal, the conference provided a platform for the presentation and publication of scientific papers, as well as interactive discussions and other forms of interpersonal exchange, which enabled participants to share their experiences and knowledge. The conference program was designed to cover the latest scientific developments in the following areas:

- Sustainable Development Management,
- Impact of Energy Consumption on Sustainable Development,
- Exploration of Green Finance's Role in Sustainable Development,
- Energy and Renewable Energy,
- Corporate Governance and Sustainability,
- Cryptocurrency and Financial Markets,
- Foreign Direct Investment and Sustainable Development,
- Internalization of Businesses and its Relation to Sustainability and International Trade,
- Biotech Industry and Collaboration,
- Work Quality and Social Sustainability,
- Thematic Analyses of Sustainable Development Goals (SDGs),
- Studies on Sustainable Business Models and Consumption,
- Impact of the Gig Economy on Sustainable Development,
- Female Education and Entrepreneurship in Support of Sustainable Development,
- Artificial Intelligence and Machine Learning,
- Algorithmic Human Resource Management,
- Consumer Behavior and Pandemic Consequences,
- Economic Analysis and Policies,
- Sustainable Tourism Development,
- Regenerative Tourism,
- Tourism Impacts on Pollution,
- Foreign Direct Investments in the Tourism Industry,





## ERAZ 2023 Participants' Affiliation

### Albania

- Business University Collage of Albania, Rruga Vangjel Noti, Tirana
- Canadian Institute of Technology, Rruga “Xhanfize Keko” Nr. 12, Tirana
- Luarasi University, Information Technology and Innovation Faculty, Rruga e Elbasanit 59, Tirana
- Metropolitan University of Tirana, Faculty of Economy, Rruga Sotir Kolea, Tirana
- Polytechnic University of Tirana, Department of Production and Management, Tirana
- Polytechnic University of Tirana, Electrical Engineering Faculty, Bulevardi Dëshmorët e Kombit Nr. 4, Tirana
- University “Aleksandër Moisiu” Durrës, Faculty of Business, Kampusi i ri universitar, Rruga Miqësia, Spitalllë, Durrës
- University “Ismail Qemali” of Vlora, Skelë, Rruga Kosova, Vlorë
- University “Aleksander Xhuvani”, Ismail Zyma Street, Elbasan
- University of New York, Faculty of Law and Social Sciences, 21 Dhjetori Square, Tirana
- University of New York, Kodra e Diellit, 1, Tirana
- University of Tirana, Faculty of Economics, Arben Broci 1, Tirana
- University of Tirana, Faculty of Law, Rruga Milto Tutulani, Tirana
- University of Tirana, Faculty of Natural Sciences, Department of Industrial Chemistry, Blvd. Zogu I., Tirana

### Austria

- Central European University, Quellenstrasse, 51-55, Wien
- University of Applied Sciences Kufstein Tirol, Finance, Accounting & Auditing, Andreas Hofer-Str. 7, Kufstein
- University of Applied Sciences Kufstein Tirol, Entrepreneurship and Financial Management, Andreas Hofer-Str. 7, Kufstein

### Bosnia and Herzegovina

- Independent University of Banja Luka, Banja Luka
- Pan-European University “APEIRON” Banja Luka, Faculty of Business Economics, Vojvode Pere Krece 13, Banja Luka

### Bulgaria

- Bulgarian Academy of Sciences - Economic Research Institute, Sofia
- Bulgarian Academy of Sciences - Institute of Philosophy and Sociology, Sofia
- New Bulgarian University, 21 Montevideo Blvd., Sofia
- Nikola Vaptsarov Naval Academy, Vasil Drumev Str. 73, Varna
- Plovdiv University, Plovdiv
- Sofia University “St. Kliment Ohridski”, Sofia
- Southwest University “Neofit Rilski”, Blagoevgrad
- Technical University of Varna, Faculty of Electrical Engineering, Studentska str. 1, Varna

- Tsenov Academy of Economics, 2 Em. Chakarov Str., Svishtov
- University of Economics - Varna, Department of Agricultural Economy, Blvd. Knyaz Boris I 77, Varna
- University of Economics - Varna, Faculty of Management, Marketing Department, Kniaz Boris I Blvd. No 77, Varna
- University of Economics – Varna, Finance and Accounting Faculty, 77 Knyaz Boris Blvd., Varna
- University of National and World Economy Sofia, Faculty of Finance and Accounting, Blvd. „8-mi Dekemvri“, 1700 Studentski Kompleks, Sofia
- Varna University of Management, 13 Oborishte Str., Varna

### China

- Beijing Institute of Technology, Center for Energy and Environmental Policy Research, Beijing
- Beijing Institute of Technology, School of Management and Economics, Beijing
- Foreign Studies University Tianjin, Tianjin
- Huzhou University, School of Economics and Management, Huzhou, Zhejiang

### Croatia

- Institute for Migration and Ethnic Studies, Trg Stjepana Radića 3, Zagreb
- Međimurje University of Applied Sciences in Čakovec, Čakovec
- Polytechnic of Rijeka, Trpimirova 2/V, Rijeka
- University North, Trg dr. Žarka Dolinara 1, Koprivnica
- University of Josipa Juraj Strossmayer in Osijek, Faculty of Economics Osijek, Trg Ljudevita Gaja 7, Osijek
- University of Rijeka, Faculty of Economics and Business, I. Filipovića 4, Rijeka
- University of Rijeka, Faculty of Law, Hahlić 6, Rijeka
- University of Rijeka, Faculty of Tourism and Hospitality Management, Primorska 46, Opatija

### Czech Republic

- AMBIS College, Lindnerova 575/1, Prague
- Mendel University in Brno, Zemědělská 1665/1, Brno

### Ethiopia

- Addis Ababa University, Addis Ababa

### Germany

- Humboldt University Berlin, Berlin

### Greece

- Hellenic Association of Political Scientists (HAPSc)
- Scientific Board of the National Centre of Public Administration and Local Government (EKDDA)
- Steering Committee of the ECPR Political Culture Standing Group
- University of Crete, Centre for Political Research & Documentation (KEPET), Department of Political Science
- University of Crete, Centre of Training and LLL (KEDIVIM)

### **Hungary**

- Budapest Business University, Alkotmány utca 9-11, Budapest
- Budapest University of Technology and Economics, Faculty of Economic and Social Sciences, Department of Environmental Economics and Sustainability, Magyar tudósok körútja 2, Budapest
- Eszterházy Károly Catholic University, Eszterházy tér 1., Eger
- Hungarian University of Agriculture and Life Science, Gödöllő
- Mathias Corvinus Collegium, Climate Policy Institute, 3-7 Tas vezér utca, Budapest
- University of Public Service, International and European Studies, Budapest

### **Italy**

- University of Brescia, Department of Law, Via San Faustino 41, Brescia
- University of L'Aquila, Department of Industrial and Information Engineering and Economics, Giuseppe Mezzanotte St., L'Aquila

### **Kazakhstan**

- National Engineering Academy of the Republic of Kazakhstan, Almaty

### **Kuwait**

- Kuwait College of Science and Technology, Doha Area

### **Montenegro**

- University Adriatik, Faculty for Mediterranean Business Studies, Street Luke Tomanovica 1, Tivat

### **Morocco**

- Ibn Tofail University, Kenitra

### **Mozambique**

- Communications Regulatory Authority - INCM
- National Institute of Social Security - INSS
- Smart Energy Initiatives
- University Saint Thomas

### **North Macedonia**

- Goce Delcev University, str. Krste Misirkov No 10-A, Stip
- International Vision University, Str. Major C. Filiposki No.1, Gostivar
- SMX Academy, Strumica
- Ss. Cyril and Methodius University in Skopje, Faculty of Economics, Blvd. Goce Delchev no. 9B, Skopje
- Ss. Cyril and Methodius University in Skopje, Faculty of Electrical Engineering and Information Technologies, Rugjer Bošković bb, Skopje
- University "St. Kliment Ohridski" - Bitola, 1st May bb., Bitola
- University of Information Science and Technology "St. Paul the Apostle" Ohrid, Partizanska str. bb, Ohrid
- University St. Kliment Ohridski - Bitola, Faculty of Tourism and Hospitality, Kej Makedonija 95, Ohrid

### **Pakistan**

- Ilma University, Department of Business Administration, Karachi

### **Portugal**

- Polytechnic Institute of Cávado and Ave, Research Center on Accounting and Taxation, Barcelos
- Polytechnic Institute of Setúbal, (ESCE/IPS), Setúbal
- University of Aveiro, GOVCOPP & DEGEIT, Santiago Campus, Aveiro
- University of Aveiro, IEETA & ESTGA, Santiago Campus, Aveiro
- University of Évora, Center of Advanced Studies in Management and Economics, Évora
- University of Lisbon, Faculty of Law, Lisbon
- University of Trás-os-Montes and Alto Douro (UTAD), Centre for Transdisciplinary Development Studies (CETRAD), Vila Real

### **Romania**

- ASE, Bucharest
- Babes Bolyai University, Strada Mihail Kogălniceanu 1, Cluj-Napoca
- Babes-Bolyai University Cluj-Napoca, Faculty of Economics and Business Administration, Department of Marketing, Str. Teodor Mihali 58-60, Cluj-Napoca
- Bucharest University of Economic Studies, Doctoral School of Economics and International Business, Bucharest
- Bucharest University of Economic Studies, Faculty of Business Administration in Foreign Languages, Piața Romană 6, Bucharest
- Danubius University of Galati, Faculty of Economic Sciences, 3 Galati Blvd., Galati
- "Dunarea de Jos" University of Galati, Str. Domneasca no. 47, Galati
- Environmental Protection Agency, Calea Dorobanților 99, Cluj-Napoca
- National University of Political Studies and Public Administration, Faculty of Public Administration, Expozitiei Blvd., 30A, Bucharest
- "Nicolae Titulescu" University, Faculty of International Relations and Administration, Văcărești Road, 185, Bucharest
- "Nicolae Titulescu" University, Faculty of Law, Calea Vacaresti no. 185, Bucharest
- Partium Christian University, Primăriei Street 36, Oradea
- Technical University of Civil Engineering, Bucharest
- Transilvania University of Brasov, 29 Eroilor Bulevard, Postal Code 500036, Brașov, România
- University Babes-Bolyai of Cluj-Napoca, Faculty of Law, 11 Avram Iancu Street, Cluj-Napoca
- University of Agronomic Sciences and Veterinary Medicine of Bucharest, 59 Mărăști Blvd, Bucharest
- University of Bucharest, Bd. Mihail Kogălniceanu no. 36-46, district 5, Bucharest
- University of Craiova, Faculty of Law, Alexandru Ioan Cuza Street, no. 13, Craiova
- University of Oradea, Faculty of Constructions, Cadastre and Architecture, 4 B. St. Delavrancea Street, Oradea
- University of Oradea, Faculty of Environmental Protection, 26 Gen. Magheru Bld, Oradea
- University Politehnica of Bucharest, Romania, Spl. Independentei 313, S6, Bucharest

### **Russia**

- National Research University, Higher School of Economics, st. Myasnitskaya 20, Moscow

- North-Eastern Federal University named after M.K. Ammosov, Institute of Modern Languages and Regional Studies, International Research Laboratory "Linguistic Ecology of the Arctic" 58 Belinskiy Str., Yakutsk, Republic of Sakha (Yakutia)
- Siberian Branch of Russian Academy of Science, Institute of Humanitarian Studies and Problems of Indigenous Peoples of the North, Department of Archeology and Ethnography, 1. Petrovskogo Str., Yakutsk, Republic of Sakha (Yakutia)
- Udmurt State University, Department of Public Service and Personnel Management, Izhevsk
- Ural Federal University named after the first President of Russia B. N. Yeltsin, Department of Philosophy, Ekaterinburg
- Ural State Law University named after V. F. Yakovlev, Department of Social and Humanitarian Disciplines, Ekaterinburg

### Serbia

- Academy of Vocational Studies Southern Serbia, Leskovac
- Association of Economists and Managers of the Balkans – Udekom Balkan, Ustanička 179, Belgrade
- Belgrade Business and Arts Academy of Applied Studies, Kraljice Marije 73, Belgrade
- Center for the Development of Economic Science, Bulevar oslobođenja 108, Belgrade
- College of Applied Studies in Economics and Administration, Belgrade
- Innovation Centre of the Faculty of Mechanical Engineering in Belgrade, Kraljice Marije 16, Belgrade
- Institute Mihajlo Pupin, Volgina 15, Belgrade
- International University of Novi Pazar, Novi Pazar
- Municipality of Vrnjačka Banja, Kruševačka 17, 36210, Vrnjačka Banja
- The Academy of Applied Technical Studies Belgrade, Katarine Ambrozić 3, Belgrade
- Toplica Academy of Vocational Studies, Kralja Petra I Karadjordjevića, Blace
- University Business Academy, Faculty of Social Sciences, Bulevar umetnosti 2a, Belgrade
- University Metropolitan, Faculty of Management, Tadeusa Košćuška 63, Belgrade
- University of Belgrade, Faculty of Mining and Geology, Djusina 7, Belgrade
- University of Belgrade, Faculty of Agriculture, Nemanjina 6, Belgrade
- University of Belgrade, Faculty of Security Studies, Gospodara Vucica 50, Belgrade
- University of Niš, Innovation center, University Square 2, Niš
- Western Serbia Academy of Applied Studies, Valjevo Department, Vuka Karadžića 3a, Valjevo

### Slovak Republic

- Alexander Dubček University of Trenčín, Faculty of Social and Economic Relations, Študentská 3, Trenčín
- Bratislava University of Economics and Management, Furdekova 16, Bratislava
- Comenius University, Faculty of Management, Odbojarov 10, Bratislava
- ČSOB, Žižkova 11, Bratislava

- Matej Bel University in Banská Bystrica, Faculty of Economics, Institute of Managerial Systems, Dlhé hony 5766/16, Poprad
- Slovak University of Agriculture in Nitra, Faculty of Economics and Management, Trieda Andreja Hlinku 2, Nitra
- Slovak University of Agriculture in Nitra, Faculty of European Studies and Regional Development, Trieda Andreja Hlinku 2, Nitra
- University of Economics in Bratislava, Faculty of Economic Informatics, Dolnozemska cesta 1, Bratislava

### Slovenia

- Celje School of Economics, Higher Vocational College, Mariborska 2, Celje
- University of Maribor, Faculty of Business and Economics, Razlagova 14, Maribor

### Spain

- Autonomous University of Madrid, Ciudad Universitaria de Cantoblanco, Madrid
- Francisco de Vitoria University, Faculty of Legal and Business Sciences, Madrid
- The Miguel Hernández University of Elche, Department of Economic and Financial Studies, Avda. de la Universidad, s/n. Edificio La Galia, Elche
- University of Navarra, Faculty of Economics, Pamplona

### Turkey

- Alanya Alaaddin Keykubat University, Department of Economics, Alanya, Antalya
- Cukurova University FEAS, Department of Economics, Balcali Campus-Saricam/Adana
- Manisa Celal Bayar University, Muradiye mah. Manisa Celal Bayar Uni. IIBF A Blok kat: 3 Muradiye/Manisa

### UAE

- Faculty of Applied Media, FWC, Higher Colleges of Technology, Fujairah

### Ukraine

- O. M. Beketov National University of Urban Economy in Kharkiv, 17, Marshal Bazhanov Street, Kharkiv
- Sumy National Agrarian University, Kondratieva St, 160, Sumy
- V. N. Karazin Kharkiv National University, 4 Svobody Sq., Kharkiv

### United Kingdom

- Royal Agricultural University, Cirencester







# Sustainable Development in the World of Lies

Kristián Čechmánek<sup>1</sup> 

Received: August 30, 2023

Accepted: December 8, 2023

Published: March 16, 2024

## Keywords:

Sustainable development;  
Sustainability;  
Knowledge;  
Sustainable Development  
Goals;  
Lies;  
Disinformation



Creative Commons Non  
Commercial CC BY-NC: This  
article is distributed under the terms of  
the Creative Commons Attribution-Non-  
Commercial 4.0 License (<https://creativecommons.org/licenses/by-nc/4.0/>) which  
permits non-commercial use, reproduc-  
tion and distribution of the work without  
further permission.

**Abstract:** *Is the process of sustainable development threatened by disinformation or is disinformation eligible to change the civilizational trajectory of the European Union's paradigmatic endeavor towards a sustainable future? As the author believes, answering the question is vital in order to adapt to the situation of new threats that change the perception, cognition, and behavior of a wide range of participants in political, public, and civil life. In order to do that, the author scrutinizes the European Union's major sustainable development policies on the one hand and various trends influenced by strong disinformation campaigns and hybrid threats towards them on the level of member states on the other hand. As the author shows, there are already observable tendencies, based on which it is possible to state a significant influence of disinformation on the sustainable development of the European Union. As the following article will point out, the social and political reality in the European Union indicate a possible paradigm shift where traditional knowledge-based sustainable development is challenged by disinformation narratives that make both European and global endeavor toward a sustainable future strongly aggravated.*

## 1. INTRODUCTION

The international community, finding out that long-term civilizational survivorship may be an issue, established in 2015 the plan known as The Sustainable Development Goals (European Commission, 2015) as a part of the UN 2030 Agenda for Sustainable Development (United Nations, 2015). Inclusiveness and sustainability in development, eradication of poverty, and ensuring human rights have become new axioms in the trajectory of global endeavor aiming very ambitious deadlines in terms of results delivery. According to the European Commission, “through its international partnerships, the EU pursues progress towards the relevant SDGs together with EU priorities...” Nevertheless, as very valuable data from the COVID-19 crisis shows, for instance, actions towards global warming and climate change mitigation, even though the process was catalyzed by lockdowns all over the globe, have shown that results were at least deplorable. As the population was restrained at homes, working, and interacting through online calls, there were radical changes in energy use with unconvincing impacts on the levels of CO<sub>2</sub> emissions (Le Quéré et al., 2020, p. 647) that were reduced by 4-8% (Evans, 2020). We are speaking about results that were achieved only thanks to extreme measures, practically by putting to death all of the social and economic life on the planet, results that were paid by an outrageous price that for instance consisted of reversing the wide trend of reduction of global extreme poverty, adding to the group of extremely poor new 150 million people (The World Bank, 2020), doubling the number of people facing acute food insecurity to 265 million in 2020 (Morgan, 2020) or causing a serious disruption of education systems that affected about 1.6 billion learners all over the world (United Nations, 2020). Cosmetic and short-term results in reducing CO<sub>2</sub> emissions were achieved only because of one of the worst humanitarian disasters in history. Sustainable goals speaking, achieving one sustainable development goal necessarily influence others (education, equality, inclusivity...). This inevitable

<sup>1</sup> Faculty of European Studies and Regional Development, Slovak University of Agriculture in Nitra, Tr. A. Hlinku 2, 949 76, Nitra, Slovak Republic

connection is however nothing special and it is a very part of the nature of complex systems (the phenomenon is described in detail mostly by political economists, philosophers, and epistemologists who study negative externalities as byproducts of interventions in various ecosystems like economy, nature, etc.). And even though achieving goals are based on thorough expertise, intervening in global interconnected systems with trillions of variables, can lead, as we can see in the real-life COVID-19 example, to unexpected results. As we can see, the nature of complex systems itself can be a serious foe for achieving goals in global policies. However, there are significantly more enemies today. Moreover, they are much more insidious than the mere unpredictable nature of a complex system. That brings us to the matter of our paper, which is focused on the problem of disinformation and its influence on the achievability of sustainable development goals. As we believe, the problem is very vivid, global and, as we will show later in the text, potentially threatening not only for moving humanity forward but also for its civilizational prevalence.

## 2. FROM DATA TO KNOWLEDGE

The vital component of decision-making in complex systems is the quality of data and flawless interpretation of information providing certain knowledge that can be used for the creation of public policies. Speaking of information and data as a concept, it is traditionally represented as a hierarchic system that provides a structure for the complexity of the phenomenon. If we are mentioning structure, we mean the DIKW pyramid that shows the relation between data, information, knowledge and wisdom. Despite the frequent use of the hierarchical relationship between the mentioned terms, it is almost impossible to identify its author (Wallace, 2007). It has been used in various permutations and variations for quite a long time. As the name of the pyramid suggests, the first component is data, which forms the basis of the entire hierarchical structure. Data are not to be reduced only to the digital environment but understood as data in the broadest context, as impulses perceived by the sensory organs, such as sounds, smells, colors, etc. To create the simplest possible definition of data, we are inspired by the theory of data as an objective reality. In its context, data are then the simplest facts that are a prerequisite for further processing, selection, which leads to the constitution of information (Ahsan & Shah, 2006, pp. 2-3). According to Becerra-Fernandez and Sabherwala (2010, p. 17), data “comprises facts, observations or perceptions (which may be correct or incorrect). By itself, data represent raw numbers or statements and can therefore be stripped of context, meaning or intent.” Thus, data represent the basic building block of the knowledge structure. There is although a noticeable tendency to confuse individual elements of the DIKW hierarchical structure. This is also why we consider it particularly important to emphasize that knowledge is neither data nor information, although it is in a certain relation to both (Davenport & Prusak, 1998, p. 1). As mentioned in the previous section, information is the next step in the hierarchy of human knowledge. But how to define it and what connects it to the data? In order to find a satisfactory answer, we are going to use the following argument according to which data usually occurs in a huge amount and, assuming that we want to obtain any practical value from it, it is necessary to transform it in the context of a specific relationship, or situation or solved problem. It is this transformation of data in a specific context that will provide us with information (Schumaker, 2011, p. 4). While computers need data, people need information. Data is a building block, information gives us meaning and is understandable for humans (Brooke, 2022). Information is therefore relevant, usable, significant, meaningful, or processed data (Frické, 2009, pp. 132-133). Even though the DIKW pyramid consists of 4 elements, it is often used only 3 three-element structures known as Knowledge hierarchy or Knowledge pyramid with knowledge as precisely that piece of information that has a specific direction and is capable of being the basis for decisions (Becerra-Fernandez & Sabherwala, 2010, p. 18). Hey (2004, p. 2) argues that knowledge is generally personal, subjective and personalized – it is the intellectual equipment

of people rather than an objectively existing category outside the human mind. Compared to data, an individual with knowledge can actively dispose of and realistically use it to solve problems because it allows a better understanding of the situation in a specific context (Schumaker, 2011, p. 5). Even though the theoretical concept of Knowledge hierarchy seems to be way too theoretical, it can be very helpful in illustrating how crucial can individual parts of the pyramid be in achieving results in reality in knowledge-based sustainable development or, on the other hand, how an improper approach towards data and information can constitute false knowledge that will be in the further text referred as antiknowledge.

### 3. FROM KNOWLEDGE TO DISTRUST

It is extremely difficult to successfully intervene in complex systems according to plans mostly because of inevitable ignorance that is tightly connected with human intellectual processes on one hand (psychological factor) (Taleb, 2007, p. 138) and also because of the objective inability to grasp even a glimpse of variables that are to be influenced by intervention or that influence the intervention itself (epistemic factor) (Bastiat, 1998). If there are to be any intervention with at least a partial hope of success, it has to be executed thoroughly and purely based on bulletproof knowledge. Regardless of the fact that even the best data, the best plan and the best intentions are far away from reality, if there is a will to change a paradigm of global life, it is the knowledge distilled from the proper data and information, interpreted in the rigorous way possible, that is an only shot. But what if the DIK (data, information, knowledge) jar is not filled with proper content? And now, let's not focus on scientific knowledge or expert institutions. In the end, these have only very limited executive power in policy enforcement. What however are capable of change, are governments and, if we take into consideration the European context, institutions of the European Union. Democracy as a ruling form of government in the European Union gives power to citizens of the European Union as a source of power or those who are entitled to rule indirectly through their representatives. In other words, the responsibility for acquiring data, information and forms of knowledge is largely on the shoulders of voters, who choose not only parties and representatives but also public policies. And this is exactly the point where the problems arise. Building a knowledge pyramid or knowledge-based (any type) development may be corrupted from the beginning of the process. People's trust in official institutions is declining, the trust that is considered a fundamental element of social capital – a key contributor to sustaining well-being outcomes, including economic development (Ortiz-Ospina & Roser, 2016). According to data from the *European Foundation for the Improvement of Living and Working Conditions (2022)*, there is a continual and not negligible decline of trust in institutions such as national governments, the EU, the police, news, etc. The majority of global democracies declined in trust index significantly and it is not perceptible only in long term period but also in one year change. For example, the Netherlands declined by 6 points from the trust range (63 points) in 2021 to the neutral range (57 points) in 2022. Germany experienced an even worse scenario when it declined by 7 points from neutral range (53 points) to distrust range (46 points). An increase in trust was experienced only in France according to the trust index. Even though France switched the range from distrust to the range of trust, it was only minimal gain. Numbers speaking, France improved its position only by 2 points (from 48 points to 50 points) (Edelman Trust Barometer, 2022, p. 21). The general tendency of distrust is followed by similar tendencies in particular parts of the societal relations. Among other things, we would like to emphasize the development of trust in government and media. First of all, it has to be stated that there are not only losses, there are also gains, however, those increases are unexpectedly connected to dictatorships or states that are not democracies per se. In Europe, the biggest losers in trust are the Netherlands and Germany. Germany loses interannually 12 points in trust in government

(from 59 points which is the limit value of neutral to trust sphere to 47 points which is on the scale of distrust). The Netherlands with its 11 points loss did not fare much better (from 69 points which belongs to the trust sphere to 58 points which is on the edge of the neutral scale). Even though the decline in trust in media is not as significant, there are apparent decreases. Germany lost interannually 5 points and the Netherlands 3 points. If we compare the situation with the broader world, it is clear that trust in media is shaken mainly in Australia and South Korea where the mentioned countries experienced an interannual decrease of 8 points in Australia (from 51 points in the neutral zone to 43 points that is in distrust) or 7 points in South Korea (From 40 points to 33 points that are both scaled as distrust rates) (Edelman Trust Barometer, 2022, p. 41). Worse values were measured only in Russia with 29 points with no interannual change (Edelman Trust Barometer, 2022, p. 41). Answering the question of what is the cause of the global pandemic of distrust would be difficult. However, what we can state with certainty is that the phenomenon of social networks, especially with the current algorithm setup, does not help this trend.

#### 4. FROM DISTRUST TO ANTIKNOWLEDGE

As we indicated in the title of our paper, we are interested in so called “lies” and their ability to influence sustainable development policies. There are evident significant risks that certain categories of lies present to governance, social order, and governance stability (Lazer et al., 2018, pp. 1094–1096). As Pulido et al. (2020) imply, under the influence of rumors and misleading information, the public tends to be trapped by groups, accentuating panic, and misusing crisis, which can even lead to social tragedies. According to Luo et al. (2021) social media not only misleads the public guiding them towards wrong decisions, in addition, it also represents substantial threats to the public’s physical and mental health and economic properties. What lies? In the context of the article, lies stand especially for disinformation, hoaxes, fake news and conspiracy theories that altogether constitute without exaggeration new type of global pandemic. There has to be a clear distinction between those types of lies that are spread intentionally and those that are not spread with bad intentions but rather with negligence, even though both types can affect public policies and political reality. In this context, there is a difference between misinformation that is unintentional and disinformation that, as pointed out in the previous sentences, is spread intentionally (Sadiq & Saji, 2022, p. 271). Apart from stated, there is according to Sadiq and Saji (2022, p. 271) another significant difference between the two phenomena. Disinformation is usually connected to politics and political campaigns where they are used as instruments intended for political gain, misinformation, on the other hand, seems to be more of a spontaneous nature. Nonetheless, both types present serious social danger which is demonstrated for instance by the World Economic Forum which identifies even misinformation as a global risk (World Economic Forum, 2022). In the end, this fear turned out to be justified, as demonstrated by the case of influencing the American elections in 2016 (Sadiq & Saji, 2022, p. 271) or the successful Brexit campaign, both of which were built to a significant extent on false information of both types. Despite the fact that all aforementioned phenomena took place in the past (Mason et al., 2018), with the emergence of social networks they were significantly reinforced. It is not only because of greater availability and possibility of connecting millions of people at the same time, and lesser critical approach towards information (Oh et al., 2013) but notably because of anxiety (which is believed to a one of the main reasons behind the misinformation) that is failed to overcome by information from mainstream media (Oh et al., 2013) and last but not least, because of specific setup of algorithms of social networks. According to whistleblower and former high-ranking executive at Meta, Frances Haugen, the management of the social network Facebook was aware of the harmfulness of the algorithms, which she said encouraged hate speech and the spread of disinformation. The company’s failure to act in the given matter was probably

caused by the concern of the company's management about profits, which are directly proportional to the amount of user interactions on the social network. It is not surprising that most interactions have radicalizing and hateful information, among which disinformation of various kinds can undoubtedly be included. As much as it might seem that Haugen is just a bitter manager out to get revenge on her former employer, she is simply not. Her claims are supported by more or less related studies, according to which, for example, in 2020, disinformation media had an average of 6 times more likes, shares and interactions than information from reliable sources such as CNN or the WHO (Dwoskin, 2021). According to another study carried out by the non-profit organization Avaaz, disinformation had approximately 3.8 billion views on the Facebook social network in 2019 alone. Surprisingly, only 16% of the total number of disinformation posts were evaluated as disinformation, the other 84% went unnoticed (Avaaz, 2020). According to available information, the marketing logic of social networks is built in such a way that it promotes an emotional lie, which we can see in the form of disinformation because it has a greater potential for interactions and shares.

## 5. ANTIKNOWLEDGE AND ITS POLITICAL REPRESENTATION

It is apparent that the problem of lies in the broader public space is substantial. There is a tendency to choose biased data, information is filtered through algorithms of social networks where the most of social interaction happens and the knowledge that stems from the latter is often misinformation, hoax, fake news, or pure disinformation. An accompanying phenomenon is the popularity of antiestablishment, radical and populist movements that themselves feed the life of lies by creating or using them in political struggle in the form of various hoaxes, disinformation, or fake news. From the local – central European environment, the rise of radical and populist parties and movements is substantial. For example, in Slovakia, pre-election polls from August indicate that solely populist and radical parties that are explicitly oriented against the EU and its development goals (e.g. environmental goals, inclusiveness, equality, solidarity, peace, or even EU membership) have the support of 39,6%, including following parties SMER-SD, Republika, SNS Aliancia, LSNS of the whole population in total (SME, 2023). Even though in the Czech Republic, a coalition of democratic parties forms a government, according to a recent poll of an agency Median (iROZHLAS, 2023) it is apparent that tendencies favor rather Euroskeptic, populist, or openly radical movements with the support of almost 60% of the population (including following parties: ANO, SPD, SOCDEM, KSČM, Trikolóra, Prísaha). In Hungary, there is a long-term democratic deficit, since there is Orbán's semi-dictatorship that is openly against the rule of law, democratic principles, and pro-Russian orientation in terms of the Russian invasion of Ukraine. EU institutions repeatedly warn of the worsening situation in the country. On many occasions, there have been expressed concerns over the state of EU values in Hungary by MEPs (European Parliament, 2023). Poland as the last (but not least) country belonging to the group V4 deserves a special place. On one hand, it is reprimanded by EU institutions for the reasons of deficiencies in the rule of law, and judicial independence, etc., on the other hand, Poland has played a significant civilizational role in its stance towards Russian aggression in Ukraine and Russian hybrid threats towards Europe. In connection with the aforementioned, we consider as necessary to emphasize that it is the Russian Federation that through hybrid threats and disinformation endangers European countries (Pillai, 2023) and values the most. This was the reason behind the emergence of specialized agencies such as Anti-Disinformation Agency in the Czech Republic (operational since January 2017) and the Centre of Excellence for Countering Hybrid Threats in Finland (operational by late 2017). On the global level, it is worth mentioning the European Union's East Stratcom Task Force and the NATO Strategic Communications Centre of Excellence (Splidsboel, 2017).

## 6. CONCLUSION

The effectiveness of achieving sustainable development goals as global, demanding intentions is dependent on perfect planning, organization and knowledge-building processes. Not only that these processes seem to be endangered by the phenomenon of disinformation, another key factor, that is crucial – the support of the citizens that constitute the source of the political power in the European Union and its member states, at least V4 states, show its shift from the pro-democratic and pro European settings towards radical and antidemocratic tendencies. Whether the common ground of mutual sustainable development goals is achieved or not will be shown in the next few years. What can be however stated today is that lies as are depicted in our article present a serious civilizational threat.

## References

- Ahsan, S., & Shah, A. (2006). Data, Information, Knowledge, Wisdom: A Doubly Linked Chain?. *International Conference on Information & Knowledge Engineering*, 26-29.
- Avaaz. (2020, August 19). Facebook's Algorithm: A Major Threat to Public Health. [https://secure.avaaz.org/campaign/en/facebook\\_threat\\_health/](https://secure.avaaz.org/campaign/en/facebook_threat_health/)
- Bastiat, F. (1998). *Co je vidět a co není vidět*. Liberální institut, Centrum liberálních studií.
- Becerra-Fernandez, I., & Sabherwala, R. (2010). *Knowledge Management: Systems and Processes*. Armonk: M.E. Sharpe, Inc.
- Brooke, C. (2022, October 6). What is the Difference Between Data and Information? <https://www.business2community.com/strategy/difference-data-information-0967136>
- Davenport, T. H., & Prusak, L. (1998). *Working Knowledge: How Organizations Manage What They Know*. Harvard Business School Press.
- Dwoskin, E. (2021, September 4). Misinformation on Facebook got six times more clicks than factual news during the 2020 election, study says. *The Washington Post*. <https://www.washingtonpost.com/technology/2021/09/03/facebook-misinformation-nyu-study/>
- Edelman Trust Barometer. (2022). [https://www.edelman.com/sites/g/files/aatuss191/files/2022-01/2022%20Edelman%20Trust%20Barometer%20FINAL\\_Jan25.pdf](https://www.edelman.com/sites/g/files/aatuss191/files/2022-01/2022%20Edelman%20Trust%20Barometer%20FINAL_Jan25.pdf).
- European Commission. (2015). Sustainable Development Goals. European Union [https://international-partnerships.ec.europa.eu/policies/sustainable-development-goals\\_en](https://international-partnerships.ec.europa.eu/policies/sustainable-development-goals_en)
- European Foundation for the Improvement of Living and Working Conditions. (2022, July 7). Trust in institutions continues to fall in EU, despite declining unemployment and phasing out of pandemic restrictions. <https://www.eurofound.europa.eu/news/news-articles/trust-in-institutions-continues-to-fall-in-eu-despite-declining-unemployment-and-phasing-out-of>.
- European Parliament. (2023, August 6). Rule of law in Hungary. [https://multimedia.europarl.europa.eu/en/package/rule-of-law-in-hungary\\_20302](https://multimedia.europarl.europa.eu/en/package/rule-of-law-in-hungary_20302)
- Evans, S. (2020, April 9). Analysis: Coronavirus set to cause largest ever annual fall in CO2 emissions. *CarbonBrief*. <https://www.carbonbrief.org/analysis-coronavirus-set-to-cause-largest-ever-annual-fall-in-co2-emissions/>
- Frické, M. (2009). The Knowledge Pyramid: A Critique of the DIKW Hierarchy. *Journal of Information Science*, 35(2), 1-13. <http://hdl.handle.net/10150/105670>
- Hey, J. (2004). The Data, Information, Knowledge, Wisdom Chain: The Metaphorical link. 1-18. <https://www.jonohey.com/files/DIKW-chain-Hey-2004.pdf>
- iROZHLAS. (2023, July 21). MEDIAN: Volby by s velkým nárůkem vyhrálo ANO. Lidovci jsou na dlouhodobém minimu. [https://www.irozhlas.cz/zpravy-domov/median-pruzkum-volby-ano-ods\\_2307210759\\_ako](https://www.irozhlas.cz/zpravy-domov/median-pruzkum-volby-ano-ods_2307210759_ako)

- Lazer, D. M. J., Baum, M. A., Benkler, Y., Berinsky, A. J., Greenhill, K. M., Menczer, F., Metzger, M. J., Nyhan, B., Pennycook, G., Rothschild, D., Schudson, M., Sloman, S. A., Sunstein, C. R., Thorson, E. A., Watts, D. J., & Zittrain, J. L. (2018). The science of fake news. *Science*, 359(6380), 1094–1096. <https://doi.org/10.1126/science.aao2998>
- Le Quéré, C., Jackson, R. B., Jones, M. W., Smith, A. J. P., Abernethy, S., Andrew, R. M., De-Gol, A. J., Willis, D. R., Shan, Y., Canadell, J. G., Friedlingstein, P., Creutzig, F., & Peters, G. P. (2020). Temporary reduction in daily global CO<sub>2</sub> emissions. *Nature Climate Change*, 10(7), 647–653. <https://doi.org/10.1038/s41558-020-0797-x>
- Luo, H., Cai, M., & Cui, Y. (2021). Spread of Misinformation in Social Networks: Analysis Based on Weibo Tweets. *Security and Communication Networks*, 2021, <https://doi.org/10.1155/2021/7999760>
- Mason, L. E., Krutka, D., & Stoddard, J. (2018). Media literacy, democracy, and the challenge of fake news. *J. Media Literacy Educ*, 10, pp. 1–10. <https://doi.org/10.23860/JMLE-2018-10-2-1>.
- Morgan, G. (2020, May 28). COVID-19 Puts 265 Million at Risk of ‘Hunger Pandemic,’ Experts Say. [https://www.voanews.com/a/covid-19-pandemic\\_covid-19-puts-265-million-risk-hunger-pandemic-experts-say/6190041.html](https://www.voanews.com/a/covid-19-pandemic_covid-19-puts-265-million-risk-hunger-pandemic-experts-say/6190041.html)
- Oh, O., Agrawal, M., & Rao, H. R. (2013). Community intelligence and social media services: a rumor theoretic analysis of tweets during social crises. *MIS Quarterly*, 37(2), pp. 407–426.
- Ortiz-Ospina, E., & Roser, M. (2016). Trust. *Our World in Data*. <https://ourworldindata.org/trust>
- Pillai, H. (2023, April 25). Protecting Europe’s critical infrastructure from Russian hybrid threats. Centre for European Reform. <https://www.cer.eu/publications/archive/policy-brief/2023/protecting-europes-critical-infrastructure-russian-hybrid>
- Pulido, M., Villarejo-Carballido, B., Redondo-Sama, G., & Gómez, A. (2020). COVID-19 infodemic: more retweets for science-based information on coronavirus than for false information. *International Sociology*, 35(4), pp. 377–392. <https://doi.org/10.1177/0268580920914755>
- Sadiq, M. T., & Saji, M. K. (2022). The disaster of misinformation: a review of research in social media. *International Journal of Data Science and Analytics*, 2022(13), pp. 271–285. <https://doi.org/10.1007/s41060-022-00311-6>.
- Schumaker, R. P. (2011). From Data to Wisdom: The Progression of Computational Learning in Text Mining. *Communications of the IIMA*, 11(1), 39–48. <https://doi.org/10.58729/1941-6687.1155>
- SME. (2023, August 20). Volebný prieskum za august 2023 (Focus). <https://volby.sme.sk/pref/1/politicke-strany>
- Splidsboel, F. H. (2017). Russian hybrid warfare: A study of disinformation, DIIS Report. Danish Institute for International Studies.
- Taleb, N. (2007). *The Black Swan: The Impact of the Highly Improbable*. Random House.
- United Nations. (2015). Department of Economic and Social Affairs. <https://sdgs.un.org/2030agenda>
- United Nations. (2020, August). Policy Brief: Education during COVID-19 and beyond. <https://un-sdg.un.org/resources/policy-brief-education-during-covid-19-and-beyond>.
- Wallace, D. P. (2007). *Knowledge Management: Historical and Cross-Disciplinary Themes*. Libraries Unlimited.
- The World Bank. (2020, October 7). COVID-19 to Add as Many as 150 Million Extreme Poor by 2021. <https://www.worldbank.org/en/news/press-release/2020/10/07/covid-19-to-add-as-many-as-150-million-extreme-poor-by-2021>.
- World Economic Forum. (2022). The Global Risks Report 2022. 17th Edition. <https://www.weforum.org/reports/global-risks-report-2022>







# Sustainable Development Management and Its Role in the Organizations

Andreea Grecu<sup>1</sup>

Received: August 30, 2023

Revised: November 15, 2023

Accepted: November 29, 2023

Published: March 16, 2024

## Keywords:

Sustainable development management;  
Leadership;  
Organizational culture



Creative Commons Non Commercial CC BY-NC: This article is distributed under the terms of the Creative Commons Attribution-Non-Commercial 4.0 License (<https://creativecommons.org/licenses/by-nc/4.0/>) which permits non-commercial use, reproduction and distribution of the work without further permission.

**Abstract:** *Any organization, whether it be a commercial or a non-profit organization, must perform the duty of sustainable development management. This is so that they can thrive while upholding the ideals of social responsibility and meeting the demands of a modern public management system. The management of sustainable development is directly related to the promotion of global responsibility leadership, and this relationship ultimately leads to a change in corporate culture. This transition entails promoting sustainable acceptability and commitment at all levels of the organization and viewing performance through a sustainability lens.*

## 1. INTRODUCTION

The phrase “sustainable development” refers to a variety of socioeconomic advancement methods and tactics, with a primary emphasis on preserving the balance between these socioeconomic systems and elements of the natural capital. Three decades ago, the idea was first connected to worries about the environment and the conflict over natural resources, notably concerning energy. The term in question is relatively new, having been created in the summer of 1992 following the Rio de Janeiro-based United Nations Conference on Environment and Development. The awareness that human activities depend on the environment and its limited resources is the foundation of the idea of sustainability. The vital components of health, social security, and economic stability within a society affect the quality of life. The environment, the economy, and society are the three main pillars of sustainable development. In the information system, these dimensions play a crucial role in the quantification and creation of an accurate picture of sustainable development.

The term “sustainable development management,” which is derived from the organizational assimilation of the concept of sustainable development, refers to the application of its principles, which is emphasized, particularly at the level of the European Union, by the integration of environmental considerations into all Community policies. Sustainable development is more than just caring about the environment in the new paradigm of all forms of development that has been imposed by the fight against climate change. Sustainable development also poses a challenge to how society and the economy are structured (Council of the European Union, 2006).

The interaction between organizational culture and sustainable development allows for a reciprocal exchange that can be characterized as “mutually beneficial.” The proactive actions taken by businesses that understand the need for sustainable development management have also led

<sup>1</sup> Technical University of Civil Engineering, Bucharest, Romania

to an increase in employee awareness and responsibility. As a result, these people have actively contributed to the adoption of techniques for sustainable development by their deeds. This contribution covers the development of a new, cooperative communal mindset in addition to just carrying out social obligations. This mentality change is essential for creating a culture that supports sustainable development (Kemp et al., 2009, pp. 78-91).

The true requirements and long-term sustainability of society can be effectively addressed by transition management when it is used to create a strong and sustainable development management framework inside an organization. The company can join a coordination network that has an expanding number of collective actors by taking a stance in favor of sustainable development.

According to descriptions from exploratory research, transition management includes both a pragmatic technique that is characterized by information acquisition and a persuasive tactic intended to foster mindsets supportive of social innovation. The idea of transition management takes on a co-evolutionary approach in the context of sustainable development. With this strategy, development management can have a positive impact on managerial and organizational cultures, as well as political ideology and governmental policies (Kemp & Martens, 2007, pp. 7-14).

## 2. INTEGRATION OF SUSTAINABILITY INTO PRACTICAL APPROACHES

Subjectivity, complexity, and the existence of competing interests are just a few of the issues that have made it difficult to successfully incorporate the essential ideas of sustainable development into conventional business strategy. The UN Sustainable Development Goals (SDGs), which are applicable in a variety of industries and contexts on a national level, were adopted in January 2016. These objectives make it possible for both public and commercial organizations to coordinate and evaluate their operations, plans, and financial results. However, under the current economic paradigm, it is not immediately clear what advantages these behaviors will have for enterprises, which emphasizes the need for the creation of new analytical frameworks and tools.

The relationship between sustainable development and corporate social responsibility (CSR) has been studied by many academics (Ebner & Baumgartner, 2006, pp. 1-17; Moon, 2007, pp. 296-306; Baumgartner, 2014, pp. 258-271; Kolk, 2016, pp. 23-34). Ebner and Baumgartner (2006) contend that Corporate Social Responsibility (CSR) should be included as a societal component of sustainable development. The writers give a thorough analysis of the importance of corporate social responsibility (CSR) and sustainable development (SD) for certain firms. They emphasize how these sustainability aspects should be integrated at different levels of management. In the scientific and professional world, the idea of corporate social responsibility (CSR) is generally accepted and valued in many areas (Hung et al., 2019, pp. 366 - 374). But there are those people who disagree with the idea of social responsibility. One of these detractors is Friedman (2007, pp. 173-178), who contends that the idea is a type of subversive training used to improve the organization's public image. Murray (2008, pp. 1-452) offers a thorough analysis of criticism, including frequent objections to corporate social responsibility (CSR). These arguments suggest that CSR's focus is overly constrained, potentially harming firms' fundamental goals and obstructing the free operation of the market. Furthermore, it is asserted that business objectives cannot be successfully achieved through the implementation of CSR projects. Fleming and Jones (2013, pp. 1-680) claim that the origin of corporate social responsibility can be disputed. According to Toft (2015, pp. 303-316), many accidents, scandals, and environmental catastrophes have caused consumers to become increasingly skeptical of corporate social responsibility

(CSR). As a result, CSR can be seen as a way of responding to new social and environmental critiques (Chiapello, 2013, pp. 60-81).

The Sustainable Development Goals (SDGs) have a broad reach and are interconnected, which emphasizes the necessity of collaboration among specialists from many fields and sectors to successfully accomplish these goals. The use of various disciplines in a cogent and integrated manner is required to address complex issues like climate change, poverty, and human rights. According to the intended outcomes of education aimed at encouraging sustainable development, the integration of various disciplines improves the ability to comprehend complex challenges and take appropriate action (Annan-Dab & Molinari, 2017).

According to the body of material already in existence, multidisciplinary education implementation has shown to be a difficult task (Kysilka, 1998, pp. 197–209; Summers et al., 2005, pp. 62–647). Additionally, many strategies have been put forth to incorporate interdisciplinary practices into educational frameworks meant to promote sustainable development (practice examples can be found in Dale & Newman, 2005, pp. 351-362; Eagan et al., 2002, pp. 48-66; Jain et al., 2013, pp. 20-24; Luppi, 2011, pp. 3244-3251). Nevertheless, despite the widely acknowledged benefits of interdisciplinary, students' willingness to adopt a holistic worldview that takes into account social, economic, and environmental aspects largely depends on their initiative, with some guidance from their teachers. Simply incorporating sustainable development principles into environmental courses or creating distinct academic fields that are not part of the core curriculum will not adequately prepare people to address sustainability issues in their daily lives.

### 3. SUSTAINABILITY AND SOCIAL MEDIA

Businesses and organizations are now considered to be essential parts of society rather than just being seen as commercial entities in the current discourse (Van Tulder, 2018). The importance of companies' effects on the environment and society has grown significantly (Waddock, 2003, pp. 114–124). This sentiment first became prevalent in the 1970s and 1980s, a time when environmental management and legislation were strengthened. Organizations discovered that it was crucial to display formal compliance during this time in order to follow the more strict laws. The incorporation of environmental issues has gradually evolved to include the organization's broader effects, going beyond simple compliance with rules to include competitive advantage and economic ethics (Siew, 2015, pp. 180–195). The phrase “corporate social responsibility” (CSR) often refers to an organization's overarching philosophy. In addition to being a widely accepted concept, corporate social responsibility (CSR) is also a topic of ongoing debate, characterized by diverse perspectives regarding the definition of “positive societal impact” and the appropriate means to achieve it (Ballou et al., 2006, pp. 65-74). CSR primarily emphasizes the necessity or benefit for organizations to consider and enhance the positive societal effects resulting from their activities. According to Garriga and Melé (2004, pp. 51–71), there are four primary forms of corporate social responsibility (CSR) initiatives. The first strategy is known as the instrumental method and it entails using social activities to enhance economic outcomes. The second strategy is a political one that makes use of the organization's power to advance society. The third strategy is called the integrated approach, and it entails incorporating societal effects within the organizational structure. Last but not least, the ethical approach requires the organization to confront its ethical obligations head-on. Corporate social responsibility (CSR) approaches that prioritize social responsibility mostly belong under the “integrated” category because these programs have a substantial impact on an organization's organizational structure and management.

The use of social media (SM) has grown to cover a wider variety of organizational duties, with a focus on the economic, social, and environmental aspects that form the basis of “sustainable development” (Kaplan & Norton, 1996). The use of social media is an illustration of the applicability of this concept to various topics that require complete strategic planning, rather than solely focusing on economic strategies, and is consistent with contemporary viewpoints on corporate sustainability.

The idea of sustainable development is a moving target that is discussed on a variety of levels, including global, national, and local ones. Organizations as well as individuals are included in this conversation. The relevance of this concept lies in its complexity, though.

Management needs to create a supportive control environment in order to assist the legal and effective undertaking and oversight of risk inside the public institutions that fall under their purview. What techniques can be used to achieve this goal? The thoughtful consideration and practical application of a tailored approach that is in line with the distinctive qualities and needs of each entity are necessary for the successful implementation of an optimal and productive framework for the organization and the implementation of internal control measures.

#### 4. ABILITIES AND INNOVATIVE SOLUTIONS

Business executives, government officials, academic institutions, non-governmental organizations (NGOs), and the media are just a few of the stakeholders who have given sustainable development substantial attention and recognition. The UN has spread this message through many programs. The global financial crisis of 2008 highlighted the need for a more sustainable world. The Global Compact is one such project that has acted as a catalyst in highlighting the significance of an all-encompassing sustainable development plan on a global level. To achieve sustainability, businesses, government agencies, and civil society have been able to work together more easily thanks to the Global Compact. Future leaders must have a thorough awareness of the complex and divisive issues connected to sustainable development due to the phenomena of globalization. It has become clear that those working in the business world need to be able to use ethical theory, human rights, climate change, biodiversity, and stakeholder management principles in order to create and carry out ethical corporate plans and practices. Sustainable development education should foster the ability to interact with stakeholders who have various and occasionally divergent interests and value systems in order to identify shared goals in addition to giving students the tools to assess sustainability concerns (Dale & Newman, 2005, pp. 351-362).

In educational and professional settings, knowledge acquisition is frequently divided into several disciplines. The adoption of an interdisciplinary approach, however, has the potential to improve comprehension of the complex problems that our world is currently facing. (Eagan et al., 2002, pp. 48–66). By creating a deeper understanding of the components of a problem and encouraging the development of solutions that include ideas from several disciplines, the integration of disciplines serves to improve problem-solving abilities. The mutual advancement of the distinctive areas of competence that different subjects may give is made easier by interdisciplinarity (Summers et al., 2005, p. 630). The categorization of knowledge is covered in Clark and Wallace’s study (2015, pp. 233–255). Discipline-specific, multidisciplinary, interdisciplinary, and transdisciplinary classifications are the four that the authors suggest. Disciplinary knowledge describes the separation and autonomous operation of various disciplines. Diverse disciplines must work together in parallel to accomplish common goals to have multidisciplinary knowledge. Interdisciplinary knowledge

requires cross-disciplinary cooperation. Last but not least, transdisciplinary knowledge denotes the absence of discipline barriers. A discipline, according to the writers, is a unique and self-contained area of human experience that has its community of experts (Nissani, 1997, p. 203).

The corporate sector, along with the government and civil society, must actively participate if the Sustainable Development Goals are to be met. This is because the private sector has a substantial portion of the cutting-edge management methods and technology that are essential for the achievement of sustainable development objectives (Sachs, 2012, pp. 2206–211). According to the *Global Compact* (2016), businesses need to put ethical behavior first before actively looking for ways to address issues with sustainable development, using innovation and collaboration as crucial tactics. The integration of environmental and social aspects of sustainability in profit-oriented commercial activities, however, remains elusive despite organizational and technological innovations upending established actors in many fields (Dentchev et al., 2016, pp. 1–4), indicating that further advancement in business management is necessary. New business philosophies and operational strategies that emphasize a more holistic approach to commerce help firms understand and explain not only how value is captured, but also how it is created, and how additional value can be obtained by increasing focus on social and environmental outcomes. Strategic thinking has reached a stage where stakeholder benefits and sustainability outcomes are intimately connected. (Baldassarre et al., 2017, pp. 175–186; Bocken et al., 2014, pp. 42–56; Zott et al., 2011, pp. 1019–1042). Whatever the situation, it is critical to promote the identification and prioritization of competitive advantage through sustainable management and development initiatives. The Sustainable Development Goals (SDGs) and the ongoing improvement of current corporate practices are both supported by this strategy.

## 5. CONCLUSION

The vital components of health, social security, and economic stability within a society affect the quality of life. The environment, the economy, and society are the three main pillars of sustainable development. In the information system, these dimensions play a crucial role in the quantification and creation of an accurate picture of sustainable development.

The interaction between organizational culture and sustainable development allows for a reciprocal exchange that can be characterized as “mutually beneficial”. The proactive actions taken by businesses that understand the need for sustainable development management have also led to an increase in employee awareness and responsibility. Due to their efforts, these people have actively contributed to the adoption of sustainable development techniques.

According to descriptions from exploratory research, transition management includes both a pragmatic technique that is characterized by information acquisition and a persuasive tactic intended to foster mindsets supportive of social innovation.

The idea of sustainable development is a moving target that is discussed on a variety of levels, including global, national, and local ones. Organizations as well as individuals are included in this conversation. The relevance of this concept lies in its complexity, though.

It is essential to promote the recognition and prioritization of competitive advantage through sustainable management and development initiatives. The Sustainable Development Goals (SDGs) and the ongoing improvement of current corporate practices are both supported by this strategy.

## References

- Annan-Dab, F., & Molinari, C. (2017). Interdisciplinarity: A Practical Approach to Advancing Education for Sustainability and the Sustainable Development Goals. Retrieved from <https://isiarticles.com/bundles/Article/pre/pdf/114243.pdf> (accessed on August 2023)
- Baldassarre, B., Calabretta, G., Bocken, N. M. P., & Jaskiewicz, T. (2017). Bridging Sustainable Business Model Innovation and User-Driven Innovation: A Process for Sustainable Value Proposition Design. *Journal of Cleaner Production*, 147, 175-186.
- Ballou, B., Heitger, D., & Landes, C. (2006). The Rise of Corporate Sustainability Reporting: A Rapidly Growing Assurance Opportunity. *Journal of Accounting*, 202, 65–74.
- Baumgartner, R. J. (2014). Managing Corporate Sustainability and CSR: A Conceptual Framework Combining Values, Strategies, and Instruments Contributing to Sustainable Development. *Corporate Social Responsibility and Environmental Management*, 21, 258–271.
- Bocken, N. M. P., Short, S. W., Rana, P., & Evans, S. (2014). A literature and practice review to develop sustainable business model archetypes. *Journal of Cleaner Production*, 65, 42-56.
- Chiapello, E. (2013). Capitalism and its criticisms. In: Gay P.D., Morgan G. (eds): *New Spirits of Capitalism? Crises, Justifications, and Dynamics*. Oxford, Oxford University Press: 60–81.
- Clark, S., & Wallace, R. L. (2015). Integration and interdisciplinarity: Concepts, frameworks, and education. *Policy Sciences*, 48(2), 233-255. <http://dx.doi.org/10.1007/s11077-015-9210-4>
- Council of the European Union. (2006). Revised European Union Sustainable Development Strategy. Brussels. Retrieved from [http://strategia.ncsd.ro/dbimg/27\\_fisiere\\_fisier.pdf](http://strategia.ncsd.ro/dbimg/27_fisiere_fisier.pdf) (accessed on August 2023)
- Dale, A., & Newman, L. (2005). Sustainable development, education, and literacy. *International Journal of Sustainability in Higher Education*, 6(4), 351-362. <http://dx.doi.org/10.1108/14676370510623847>
- Dentchev, N., Baumgartner, R., Dieleman, H., Jóhannsdóttir, L., Jonker, J., Nyberg, T., Rauter, R., Rosano, M., Snihur, Y., Tang, X., & van Hoof, B. (2016). Embracing the variety of sustainable business models: social entrepreneurship, corporate intrapreneurship, creativity, innovation, and other approaches to sustainability challenges. *Journal of Cleaner Production*, 113, 1-4. <https://doi.org/10.1016/j.jclepro.2015.10.130>
- Eagan, P., Cook, T., & Joeres, E. (2002). Teaching the importance of culture and interdisciplinary education for sustainable development. *International Journal of Sustainability in Higher Education*, 3(1), 48-66. <http://dx.doi.org/10.1108/14676370210414173>
- Ebner, D., & Baumgartner, R. J. (2006). The relationship between sustainable development and corporate social responsibility. In: *Proceedings Corporate Responsibility Research Conference, Ireland, Sept 5–6, 2006*: 1–17.
- Fleming, P., & Jones, M. T. (2013). *The End of Corporate Social Responsibility: Crisis and Critique*. London, SAGE Publications: 1–680.
- Friedman, M. (2007). The social responsibility of business is to increase its profits. In: *Corporate Ethics and Corporate Governance*. Berlin, Heidelberg, Springer: 173–178.
- Garriga, E., & Melé, D. (2004). Corporate social responsibility theories: Mapping the territory. *Journal of Business Ethics*, 53, 51–71.
- Global Compact. (2016). Making global goals local business: A new era for responsible business. New York: United Nations Global Compact. Available at: [https://www.unglobalcompact.org/docs/about\\_the\\_gc/MakingGlobalGoalsLocalsBusinessSummit.pdf](https://www.unglobalcompact.org/docs/about_the_gc/MakingGlobalGoalsLocalsBusinessSummit.pdf) (Accessed on August 2023)
- Hung, S., Li, C., & Lee, J. (2019). Firm growth, business risk, and corporate social responsibility in Taiwan's food industry. *Agricultural Economics – Czech*, 65, 366–374.

- Jain, S., Aggarwal, P., Sharma, N., & Sharma, P. (2013). Fostering sustainability through education, research and practice: A case study of TERI University. *Journal of Cleaner Production*, 61, 20-24. <http://dx.doi.org/10.1016/j.jclepro.2013.04.021>
- Kaplan, R. S., & Norton, D. P. (1996). Using the Balanced Scorecard as a Strategic Management System; Harvard Business Review: Boston, MA, USA.
- Kemp, R., Loorbach, D., & Rotmans, J. (2009). Transition management as a model for managing processes of co-evolution towards sustainable development. *International Journal of Sustainable Development & World Ecology*, 14(1), 78-91. <http://dx.doi.org/10.1080/13504500709469709>
- Kemp, R., & Martens, P. (2007). Sustainable development: how to manage something that is subjective and never can be achieved? *Sustainability: Science, Practice, & Policy*, Fall 2007, Vol. 3, Issue 2, pp. 7-14. <http://ejournal.nbii.org>
- Kolk, A. (2016). The social responsibility of international business: From ethics and the environment to CSR and sustainable development. *Journal of World Business*, 51, 23-34.
- Kysilka, M. L. (1998). Understanding integrated curriculum. *The Curriculum Journal*, 9(2), 197-209. <http://dx.doi.org/10.1080/0958517970090206>
- Luppi, E. (2011). Training to education for sustainable development through e-learning. *Procedia Social and Behavioral Sciences*, 15, 3244-3251. <http://dx.doi.org/10.1016/j.sbspro.2011.04.279>
- Moon, J. (2007). The contribution of corporate social responsibility to sustainable development. *Sustainable Development*, 15, 296-306.
- Murray, A. (2008). Corporate Responsibility: A Critical Introduction. Oxford, Oxford University Press: 1-452.
- Nissani, M. (1997). Ten cheers for interdisciplinarity: The case for interdisciplinary knowledge and research. *The Social Science Journal*, 34(2), 201-216. [http://dx.doi.org/10.1016/S0362-3319\(97\)90051-3](http://dx.doi.org/10.1016/S0362-3319(97)90051-3)
- Sachs, J. D. (2012). From Millennium development goals to sustainable development goals. *The Lancet*, 379(9832), 2206-2211. [http://dx.doi.org/10.1016/S0140-6736\(12\)60685-0](http://dx.doi.org/10.1016/S0140-6736(12)60685-0)
- Siew, R. Y. (2015). A review of corporate sustainability reporting tools (SRTs). *Journal of Environmental Management*, 164, 180-195.
- Summers, M., Childs, A., & Corney, G. (2005). Education for sustainable development in initial teacher training: Issues for interdisciplinary collaboration. *Environmental Education Research*, 11(5), 623-647. <http://dx.doi.org/10.1080/13504620500169841>
- Toft, K. H. (2015). Liberal CSR and new Marxist criticism. In: Corporate Social Responsibility and Governance. Cham, Springer: 303-316.
- Van Tulder, R. (2018). Business and the Sustainable Development Goals: A Framework for Effective Corporate Involvement. Rotterdam School of Management, Erasmus University: Rotterdam, The Netherlands.
- Waddock, S. (2003). Stakeholder performance implications of corporate responsibility. *International Journal of Business Performance Management*, 5, 114-124.
- Zott, C., Amit, R., & Massa, L. (2011). The business model: recent developments and future research. *Journal of Management*, 37, 1019-1042.







# Implementation of Sustainable Development Goals in European and Western Balkans Countries

Velibor Jovanović Gavrilović<sup>1</sup> 

Received: July 31, 2023

Accepted: October 31, 2023

Published: March 16, 2024

## Keywords:

Sustainable Development Goals;  
Composite SDG index;  
Measuring progress;  
European Union;  
Western Balkans



Creative Commons Non Commercial CC BY-NC: This article is distributed under the terms of the Creative Commons Attribution-NonCommercial 4.0 License (<https://creativecommons.org/licenses/by-nc/4.0/>) which permits non-commercial use, reproduction and distribution of the work without further permission.

**Abstract:** Sustainable development is one of the key topics in contemporary discussions on development. Over time, the concept has evolved from a vague vision of development centered on environmental issues to a comprehensive development paradigm that includes economic, social and environmental aspects. The Sustainable Development Goals (SDGs) of the UN, which are the focus of this paper, reflect that broader, modern approach to sustainable development. The paper aims to measure the progress of the countries of the EU and the Western Balkans in terms of achieving SDGs. For this purpose, the composite SDG Index, developed by the Bertelsmann Stiftung and the Sustainable Development Solutions Network, was used. This index is decomposed into three pillars - economic, social and environmental, in order to monitor and analyze the achieved results more easily. Conducted research reveals the weak points in the implementation of SDGs and indicates the priority directions of action.

## 1. INTRODUCTION

The world has been facing serious economic, social and environmental challenges for a long time. In response to those challenges, the concept of sustainable development was defined, which represents a universal development paradigm applicable to all countries, regardless of their level of development. The idea of sustainable development has evolved. In the beginning, the emphasis was placed on the problems of the natural environment (excessive exploitation of natural resources and environmental pollution), then the focus was shifted to social issues (poverty, inequality), and finally, a comprehensive approach to sustainable development was affirmed, which advocates the simultaneous realization of economic, social and environmental goals (Hajian & Kashani, 2021). The win-win-win approach, in which all three dimensions of sustainable development are combined, and possible conflicts are reduced to a minimum, enjoys wide support today.

Sustainable development is a development that lasts, rests on sound economic foundations, and is socially just and environmentally suitable. Sustainability in the context of sustainable development does not mean commitment to the *status quo*, but preservation of development opportunities. Sustainable development is not development in the present at the expense of the future, but development that implies responsible behavior towards both current and future generations. A country that wants to follow the path of sustainable development must minimize activities whose costs fall on the burden of future generations.

A comprehensive approach to sustainable development, which also respects the interests of both current and future generations, has its roots in the famous **World Commission on Environment and Development – WCED (1987)** report. In it, sustainable development is defined as “development

<sup>1</sup> Center for the Development of Economic Science, Bulevar oslobođenja 108, 11000 Belgrade, Serbia

that meets the needs of the present without compromising the ability of future generations to meet their own needs” (p. 43).

The holistic understanding of sustainable development, which includes the economic, social and environmental dimensions, was also expressed in the 2030 Agenda for Sustainable Development, adopted in September 2015 by 193 countries of the world (United Nations, 2015). The aforementioned agenda includes a set of 17 universally applicable, integrated Sustainable Development Goals (SDGs) which are focused on improving the current situation in areas that are of key importance for humanity and the planet by 2030.

Defining SDGs certainly contributes to the affirmation of the idea of sustainable development in the global framework. These goals represent a roadmap for determining development agendas and national policies of individual countries, as well as for their international cooperation.

Monitoring progress in achieving SDGs is given considerable attention in the economic literature by both statisticians and researchers. National statistical institutes are mostly occupied with the development of comprehensive sets of indicators for monitoring the implementation of SDGs, while researchers from the academic sphere and non-governmental organizations are primarily focused on creating composite indices for measuring progress in achieving sustainable development (Hametner & Kostetckaia, 2020). When it comes to statistical institutes, we should mention that Eurostat has developed an official set of indicators for monitoring progress in the implementation of SDGs in EU countries (Eurostat, 2017). The selection of indicators is updated every year. The EU SDG indicator set serves as a basis for creating Eurostat’s annual monitoring report on progress towards the SDGs in an EU context. The latest 2023 Report is based on a set of 100 indicators selected for their statistical quality and policy relevance (Eurostat, 2023). Although the list of specific indicators is useful when looking at the progress of SDG implementation, the abundance of indicators makes it difficult to compare them across countries, as well as to assess trends at the national level. Composite indices, which combine individual indicators into one number comparable across countries, are simpler and easier to interpret. Among the more recent studies that rely on composite indices to compare the performance of European and other countries in terms of achieving SDGs, we will mention: Campagnolo et al. (2018) who use the FEEM sustainability index to assess the future dynamics of indicators of sustainable development under different scenarios, Miola and Schiltz (2019), who compare the results of applying three methods of measuring SDGs performance marked as «simple mean», «distance measure» and «progress measure», Hametner and Kostetckaia (2020), who proposed an absolute measure of the progress of countries towards the SDGs, OECD (2022), which constructed a composite index based on the UN global SDGs indicators.

This paper aims to review the progress of the countries of the European Union and the Western Balkans in terms of achieving SDGs. For this purpose, the composite SDG Index, developed by the Bertelsmann Stiftung and the Sustainable Development Solutions Network (SDSN) (Sachs et al., 2023), is used, which is among the most prominent composite indices for measuring the performance of national economies in achieving the SDGs (Hametner & Kostetckaia, 2020). For the mentioned index, data are available from 2016, when the implementation of the COR began. We will decompose the SDG index into three pillars - economic, social and environmental to more easily monitor and analyze the achieved results.

The main research questions we will try to answer are:

- **Research question One:** What regional differences exist among EU members when it comes to achieving SDGs and what is the position of the countries of the Western Balkans?
- **Research question Two:** In which dimension is the delay in the implementation of the SDGs most pronounced and are there differences between the EU and the countries of the Western Balkans?
- **Research question Three:** Has there been a convergence in the performance of European subregions in terms of achieving SDGs in total and by individual clusters of goals?

The paper is structured in five sections. Part 2 is devoted to the methodology used in this research. In Part 3, the obtained results are presented and discussed. Section 4 indicates directions for future research. Section 5 summarizes the conclusions reached in the paper.

## 2. METHODOLOGY

The 2023 SGD Index, which is the starting point in this research, includes 97 global indicators selected in consultation with experts and grouped into 17 goals (Sachs et al., 2023). The aggregation of indicators into goals is justified from a conceptual aspect and corresponds to the need to monitor progress by goals (Papadimitriou et al., 2019). Reliable and publicly available data published by international organizations (such as the World Bank, WHO, and ILO), as well as research centers and non-governmental organizations were used to increase the availability of data.

The procedure for calculating the SDG Index includes three steps. First, the lower and upper limits for each indicator are determined. Explicit/implicit SDGs targets (e.g. zero poverty), science-based targets (e.g. zero CO<sub>2</sub> emissions no later than 2050), or the average of the five countries with the best performance are taken as the upper limit. The lower limit is set at the 2.5<sup>th</sup> percentile of distribution by indicators, in order to eliminate the influence of extreme values that can distort the results of the composite index. The distribution of each indicator is censored so that all values that exceed the upper limit have a score of 100, and values below the lower limit have a score of 0. Then, each variable is normalized on a scale from 0 to 100 using the mini-max method, where 0 indicates the worst, and 100 optimal performance, in order to ensure comparability of data across indicators. The SDG Index score expresses the country's achievements on the SDGs in percentages. The difference between 100 and the SDG Index score of a given country is the distance, expressed in percentage points, that needs to be overcome in order to reach optimal performance in achieving SDGs. Finally, the scores for each goal are determined as the arithmetic mean of the indicators for that goal and the average scores for all 17 goals are calculated in the same way (Lafortune et al., 2022). Applying the arithmetic mean indicates equal weights for the respective components. At the level of goals, this is justified by the fact that all goals have equal importance as part of the 2030 Agenda. At the level of indicators, equal weights have been kept because the alternatives are considered less satisfactory, although due to the unequal number of indicators within the different objectives they effectively have different weights ("implicit weighting") (Papadimitriou et al., 2019).

Based on Van Norren (2017), SDGs clustering was carried out in three categories - economic, social and environmental, each of which contains 5 objectives. The remaining two goals have a specific status because they can be considered as factors that enable the realization of other goals, rather than goals *per se*. Accordingly, Goal 17, which relates to a global partnership for sustainable development, is presented in Figure 1 as the framework within which development

takes place, while Goal 16, which concerns peace, access to justice and effective institutions, forms the core of the circle of goals.

By clustering the goals into categories, a clear connection between SDGs and the concept of sustainable development is established, and it facilitates their understanding and analysis. Nevertheless, it carries the danger of disintegration of sustainable development, which is fully covered through SDGs, with great efforts. Presenting SDGs within a circle, as it is done in Figure 1, at least visually, solves a potential problem, because, despite the clustering of goals, their connection is seen and a holistic approach to sustainable development is affirmed.

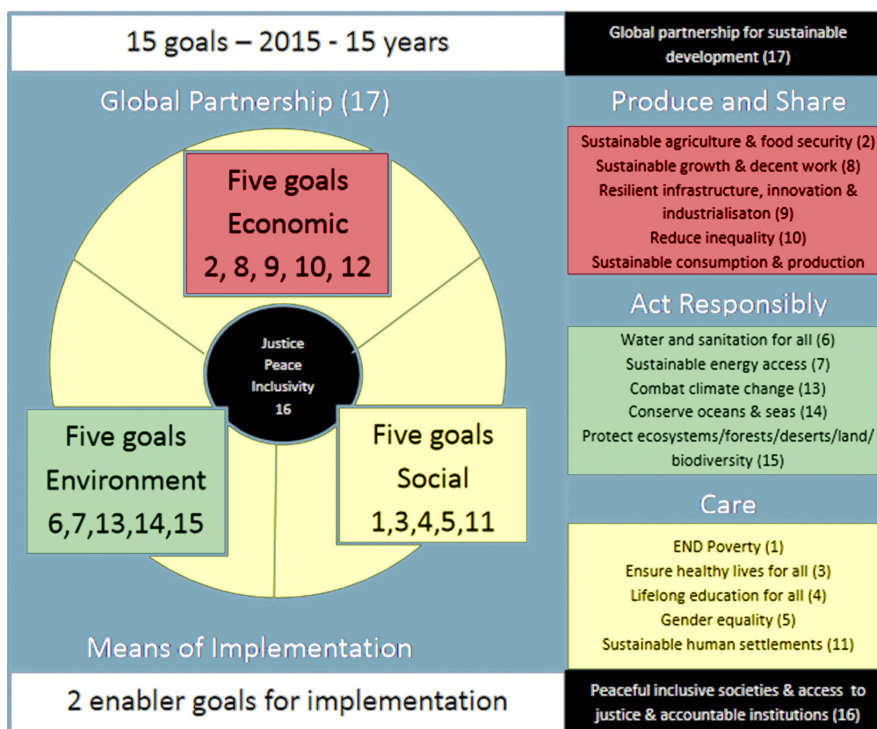


Figure 1. Clustering of SDGs

Source: Van Norren, 2017

### 3. RESULTS AND DISCUSSION

The empirical analysis covers 27 EU members and 5 countries of the Western Balkans, whose position is observed and evaluated in a global framework among 166 countries of the world for which relevant data are available. In general, European countries record the best results in the world according to the SDG index. All 20 countries at the top of the list are from Europe, most from the EU. The worst-placed country in the observed sample - Montenegro, ranks 67<sup>th</sup> in the world.

Among European countries from the EU and the Western Balkans, there are significant differences in SDG performance observed at the level of individual countries, subregions and groups of goals. The average SDG Index score (weighted by the number of inhabitants) for EU countries in 2022 is 81.1 (see Table 3), which is significantly above the world average in the same year of 66.7. The best results, as shown in Table 1, were recorded by Finland (86.8), followed by Sweden (86.0) and Denmark (85.7), and the worst by Cyprus (72.5), Bulgaria (74.6) and Malta (75.5). The gap in the level of the SDG Index in the world is indicated by the comparative data related to the three countries from the bottom of the list - South Sudan (38.7), the Central African

Republic (40.4), and Chad (45.3) (Sachs et al., 2023). Among the countries of the Western Balkans, Serbia has the best result according to the SDG Index, which is better placed than some EU countries (Lithuania, Malta, Bulgaria, Cyprus), and Montenegro has the worst.

**Table 1.** The 2022 SDG Index of EU and WB countries: rank and score

Rank	Country	Score					
		SDG Index	Economic Goals	Social Goals	Environmental Goals	Goal 16	Goal 17
1	Finland	86.8	80.5	95.1	85.8	92.5	75.6
2	Sweden	86.0	79.5	95.5	82.5	88.5	85.8
3	Denmark	85.7	79.7	94.8	81.7	93.8	82.1
4	Germany	83.4	79.7	92.3	76.6	89.5	84.4
5	Austria	82.3	79.5	93.4	77.3	87.9	71.1
6	France	82.0	79.7	94.2	75.2	76.1	73.1
8	Czechia	81.9	79.3	90.6	80.9	84.2	68.6
9	Poland	81.8	80.4	88.5	79.2	77.4	72.6
10	Estonia	81.7	74.1	90.6	81.4	91.0	67.3
12	Croatia	81.5	78.8	86.8	85.2	72.1	59.4
13	Slovenia	81.0	77.3	90.0	78.4	80.5	68.2
14	Latvia	80.7	71.4	89.3	86.3	82.1	54.4
16	Spain	80.4	76.9	93.8	74.3	79.2	63.0
17	Ireland	79.3	75.5	92.4	74.6	89.1	61.2
18	Portugal	80.0	75.9	92.6	74.2	80.9	65.9
19	Belgium	79.5	79.5	92.8	67.2	85.8	67.4
20	Netherlands	79.4	77.0	94.5	67.1	86.7	70.8
22	Hungary	79.4	80.8	86.3	81.2	69.1	54.1
23	Slovak Republic	79.1	79.4	85.3	79.7	77.8	59.0
24	Italy	78.8	77.3	86.9	76.0	72.9	65.2
28	Greece	78.4	74.3	87.5	78.3	71.1	60.8
33	Luxembourg	77.6	71.3	95.8	63.8	89.7	73.4
35	Romania	77.5	76.4	80.8	81.2	73.4	51.3
36	Serbia	77.3	78.0	82.8	73.9	65.9	83.5
37	Lithuania	76.8	66.8	88.6	76.9	84.8	59.5
41	Malta	75.5	74.0	88.6	70.4	64.9	54.1
44	Bulgaria	74.6	68.6	80.8	76.3	68.5	71.9
47	Bosnia and Herzegovina	74.0	69.4	72.5	79.5	66.2	84.7
54	Albania	73.5	67.8	81.1	75.7	60.7	65.6
59	Cyprus	72.5	68.1	86.2	67.9	74.7	46.9
60	North Macedonia	72.5	68.4	72.9	78.4	73.9	72.7
67	Montenegro	71.4	62.4	78.9	68.7	78.5	85.7

Source: Sustainable Development Report, 2023; own calculations

For the analysis of subregional differences, EU countries are classified into five groups, as presented in Table 2, which also includes the Western Balkans. Aggregate values for the observed European subregions are weighted by the number of inhabitants and presented in Table 3. The best performances are recorded by the countries of Northern Europe with an average SDG Index score of 86.1. Western Europe follows with 81.9, then Central and Eastern Europe for which the corresponding data is 80.0, then Southern Europe with a score of 79.4, and, finally, the Baltic countries with 79.1. The Western Balkans, as expected, has the worst performance and record an average SDG Index score of 75.0.

**Table 2.** Grouping of selected European countries into subregions

Baltic States	Central and Eastern Europe	Western Balkans	Northern Europe	Southern Europe	Western Europe
Estonia	Bulgaria	Albania	Denmark	Cyprus	Austria
Latvia	Czechia	Bosnia and Herzegovina	Finland	Greece	Belgium
Lithuania	Croatia	Montenegro	Sweden	Italy	France
	Hungary	North Macedonia		Malta	Germany
	Poland	Serbia		Portugal	Ireland
	Romania			Spain	Luxembourg
	Slovak Republic				Netherlands
	Slovenia				

Source: Adapted from [Lafortune et al., 2022](#)

Observed by groups of goals, the average score for economic objectives at the EU level in 2022 is 78.3 (see Table 3). According to the achieved results, as presented in Table 1, Hungary, Finland and Poland stand out, having gone more than 80% of the way to the desired result, while Lithuania, Cyprus and Bulgaria are the furthest from it (below 70%). Among the countries of the Western Balkans, Serbia is ranked best, followed by several EU members, and Montenegro is the worst.

**Table 3.** The 2022 SDG Index Score: EU and European subregions

	Score					
	SDG Index	Economic Goals	Social Goals	Environmental Goals	Goal 16	Goal 17
<b>European Union</b>	81.1	78.3	90.8	76.5	80.3	70.6
<b>Baltic States</b>	79.1	69.8	89.3	80.9	84.9	59.6
<b>Central and Eastern Europe</b>	80.0	78.5	86.0	80.0	75.7	64.6
<b>Western Balkans</b>	75.0	72.4	78.7	75.9	66.5	79.2
<b>Northern Europe</b>	86.1	79.8	95.2	83.1	90.9	82.2
<b>Southern Europe</b>	79.4	76.7	90.0	75.3	75.7	63.9
<b>Western Europe</b>	81.9	79.3	91.9	74.6	84.3	70.0

Source: [Own calculations based on Sustainable Development Report, 2023](#)

At the level of subregions (see Table 3), in terms of achieved economic goals, Northern Europe leads the way - 79.8, followed by Western Europe - 79.3, Central and Eastern Europe - 78.5, Southern Europe - 76.7 and the Baltic countries - 69.8. The Western Balkans recorded a score of 72.4 for the economic group of objectives, which puts it in a better position than the Baltic States in the year under review.

As for social goals, the average score for EU countries in 2022 is 90.8. Luxembourg, Sweden and Finland are ranked the best, having gone more than 95% of the way to the desired performance in the social domain. At the bottom of the list of EU countries are Bulgaria and Romania, whose score is slightly above 80. Among the countries of the Western Balkans, Serbia records the best results in the cluster of social goals, and Bosnia and Herzegovina the worst.

The order by subregions is somewhat different concerning economic goals, i.e. Northern Europe still leads with a score of 95.2, followed by Western Europe - 91.9, Southern Europe - 90.0, Baltic countries – 89.3, and Central and Eastern Europe - 86. The Western Balkans recorded a score of 78.7. It is evident that Central and Eastern Europe have a relatively worse position in terms of social than economic goals.

The average score for the cluster of environmental goals in the EU in 2022 is 76.5. The best results were achieved by Latvia, Finland and Croatia, which covered more than 85% of the way to the desired goal. At the bottom of the list is Luxembourg with a score of only 63.8. Of the countries of the Western Balkans, the best results in this domain are recorded by Bosnia and Herzegovina, and the worst by Montenegro.

Performance in terms of achieving environmental goals by subregion is as follows: Northern Europe - 83.1, Baltic countries - 80.9, Central and Eastern Europe - 80.0, Southern Europe - 75.3 and Western Europe - 74.6. The Western Balkans has a score of 75.9, which is above that achieved in Western Europe and Southern Europe.

As expected, the EU countries record better results in terms of achieving the SDGs overall and by individual groups of goals - economic, social and environmental, than the countries of the Western Balkans. Within the EU, an above-average SDG Index score is characteristic of Northern and Western Europe, while other subregions lag behind the average. Observed by groups of goals, the EU has the best performance in terms of social goals, and the worst in environmental goals. In the face of multiple crises, most high-income countries have been able to mitigate adverse socio-economic effects through the application of automatic stabilizers, as well as additional spending and recovery plans, but limited progress has been made in the domain of environmental goals. Luxembourg, the Netherlands and Belgium contributed the most to the relative lagging behind of Western Europe in terms of environmental goals, especially in the fight against climate change. In the case of Southern Europe, which also stands out for its relatively poor environmental score, below-average results are recorded by Cyprus, Malta, Portugal and Spain, and the lag is most evident in the preservation of oceans and seas. Crisis conditions indicated a limited fiscal space for interventions in less developed economies, which had a negative impact on related goals and indicators. The Western Balkans, like the EU countries, lead the way when it comes to the cluster of social goals but record the worst results in the group of economic goals, where all countries except Serbia were below the average in this subregion.

It is evident that Northern Europe occupies a leading position among European subregions, whether one looks at the overall SDG Index score or the scores for individual groups of goals. This can be related to the specific socio-economic model characteristic of these countries, the so-called Scandinavian welfare model, which has proven to be superior in achieving SDGs (Janković Šoja et al., 2016).

Goal 16 recognizes the vital role of peace, justice and strong institutions in achieving sustainable development. The weighted average for the mentioned goal in the EU area in 2022 is 80.3. The best performances in terms of the implementation of Goal 16, as shown in Table 1, are recorded by Denmark and Finland with a score of 93.8 and 92.5 respectively, and the worst by Malta, Bulgaria and Hungary whose scores are 64.9, 68.5 and 69.1 respectively. Among the countries of the Western Balkans, Montenegro (78.5) and North Macedonia (73.9) stand out for their good results, while Albania (60.7) is at the bottom.

At the subregional level, according to Table 3, the order of achievements in the realization of Goal 16 is as follows: Northern Europe - 90.9, Baltic countries - 84.9, Western Europe - 84.3, and Southern Europe and Central and Eastern Europe, which have the same score - 75.7. The Western Balkans, with a score of 66.5, lags behind the EU average, as well as each of its subregions.

Goal 17 underlines the need for global cooperation in achieving the set SDGs. The weighted average for the mentioned goal at the EU level in 2022 is 70.6. According to the achieved results in the observed group of countries, Sweden stands out, followed by Germany and Denmark, where all three countries have passed more than 80% of the way to the maximum value of 100. Cyprus has the worst performance, with a score of only 46.9.

The subregional distribution of scores for Objective 17 within the EU shows that the leading place is still occupied by Northern Europe - 82.2. It is followed by Western Europe - 70.0, Central and Eastern Europe - 64.6, Southern Europe - 63.9 and the Baltic countries 59.6. The Western Balkans recorded a score of 79.2, which ranks it second among European subregions. However, when comparing the performance of the countries of the Western Balkans and the EU, one should be careful, because some indicators, such as official development aid, refer only to developed economies. Also, among the countries of the Western Balkans, there are differences in the availability of data for certain indicators within Goal 17, which is reflected in the final result, so the possibilities of comparison within this subregion are limited.

By far the lowest score at the level of the EU and all subregions, excluding Northern Europe, was registered for Goal 17, which is very important for the achievement of all other goals, especially in the current turbulent times marked by geopolitical tensions and climate change, including the rise in energy and food prices that it particularly affects the most vulnerable countries and population groups.

The COVID-19 pandemic, the war in Ukraine and other crises have adversely affected the progress of SDGs implementation in Europe and the world. Even before 2020, global progress on SDGs was too slow to meet the goals set by 2030. The value of the SDG index for the world as a whole increased from 63.8 in 2015 to 66.0 in 2019, which is an increase of only 0.55 p.p. average per year. With the onset of the pandemic, progress almost stopped, and by 2022 it amounted to an average of 0.23 p.p. As for the EU, the value of the SDG Index increased from 79.2 in 2015 to 80.4 in 2019, i.e. by 0.3 p.p. average per year. By 2022, that growth further slowed down to 0.2 p.p. The results show that halfway to 2030, convergence has occurred on European soil, with subregions that started with a lower SDG Index score, such as the Baltic countries, Central and Eastern Europe and Southern Europe (within the EU), and The Western Balkans achieved faster growth. From 2015 to 2022, the score of Northern European countries, for example, increased by 0.10 p.p. average per year, and the Western Balkans by 0.44 p.p. However, the pace of convergence is slow. If the growth dynamics in the countries of the Western Balkans were to remain at the current level, these countries would need 25 years to reach the current SDG Index score of Northern Europe (Own calculations based on [Sustainable Development Report, 2023](#)).

Multiple crises have led to a slowdown in progress in the implementation of all three groups of goals at the EU level, with the deceleration being the most pronounced in environmental goals. Convergence at the level of European subregions was manifested only in the cluster of economic objectives, through a faster increase in performance in subregions with a lower initial score. Thus, for example, from 2015 to 2022, the score of the countries of Northern Europe in terms of economic goals increased by only 0.04 p.p. average per year, and in the Western Balkans by as much as 1.1 pp. In the case of social and environmental goals, there are no signs of convergence, that is, the *status quo* is more or less preserved, with the fact that in the countries of Central and Eastern Europe, a slight lag is noticeable in both groups of goals (Own calculations based on [Sustainable Development Report, 2023](#)).



The average weighted score for Objective 16 did not change at the EU level in the period from 2015 to 2022. As for Goal 17, the polycrisis acted to accelerate the growth of the corresponding score, which increased from 0.30 p.p. in the period 2015-2019. to 0.94 p.p. on average annually until 2022. At the subregional level, when it comes to Goal 16, there are slight tendencies of the Baltic and Southern European countries catching up with the leading European countries, while the Western Balkans, as well as Central and Eastern Europe, are lagging. In contrast, with Goal 17, the convergence process is visible, but slow to materialize. (Own calculations based on [Sustainable Development Report, 2023](#)).

#### 4. FUTURE RESEARCH DIRECTIONS

The SDG Index, that we have analyzed in this paper, has the potential for further modifications and improvements. So, for example, instead of the arithmetic mean, when constructing this index, the geometric mean could be used as an alternative method of aggregation, which does not allow compensability between the variables, i.e. that a high score on one variable can completely neutralize low scores on other variables. Also, in parallel with the SDG Index, other composite indices can be used to measure performance in achieving the SDGs, especially those that monitor the absolute progress of individual countries over time (instead of their relative position in relation to the other countries included in the analysis), with a comparison of the obtained results. In addition, performance measurement in the implementation of the SDGs can serve as a starting point for creating policies aimed at achieving the desired goals and as an indicator of the effectiveness of earlier decisions.

#### 5. CONCLUSION

Since the adoption of the SDGs, there has been a growing interest in measuring progress in their implementation, especially by constructing composite indices. Using the SDG Index, the paper analyzed the performance of the EU and its subregions, as well as the Western Balkans in terms of achieving the set goals. Starting from *research question one*, it was shown that among the European subregions in the implementation of the SDGs the countries of Northern Europe and Western Europe are leading with an above-average SDG Index score, while the other subregions lag behind the average. The worst position in the European environment is occupied by the Western Balkans with an average SDG Index score that is, however, significantly above the world average. It was also established that the lag in the implementation of SDGs at the EU level is most pronounced in environmental goals, and in the countries of the Western Balkans in economic goals, thus providing an answer to *research question two* posed in the paper. Regarding *research question three*, the analysis reveals that there has been a convergence in the performance of the European subregions in terms of achieving SDGs overall and in the cluster of economic objectives, but the pace of convergence is very slow. The fact that the lowest score at the level of the EU and all subregions (excluding Northern Europe) is recorded for Goal 17, which is very important for the achievement of all other goals, is worrying. Strengthening multilateral cooperation in the European, but also wider, world framework is necessary to shape a safer future and trace the path to dynamic and sustainable development.

## References

- Campagnolo, L., Carralo, C., Eboli, F., Farnia, L., Parado, R., & Pierfederici, R. (2018). Front-runners and laggards: How fast are the EU member states progressing towards the sustainable development goals?. *Social Indicators Research*, 136, 73–116. <https://doi.org/10.1007/s11205-017-1572-x>
- Eurostat. (2017). *Sustainable Development in the European Union. Monitoring Report on Progress towards the SDGs in an EU Context*. Luxembourg: Publications Office of the European Union.
- Eurostat. (2023). *Sustainable development in the European Union. Monitoring Report on Progress towards the SDGs in an EU Context*. Luxembourg: Publications Office of the European Union.
- Hajian, M., & Kashani, S. J. (2021). Evolution of the concept of sustainability. From Brundtland Report to sustainable development goals. In H. Chaudhery Mustansar, & F.V. Juan (Eds.), *Sustainable Resource Management: Modern Approaches and Contexts* (1st edition, pp. 1-24). Elsevier. <https://doi.org/10.1016/C2020-0-01655-5>
- Hametner, M., & Kostetckaia, M. (2020). Frontrunners and laggards: How fast are the EU member states progressing towards the sustainable development goals?. *Ecological Economics*, 177(C), 106775. <https://doi.org/10.1016/j.ecolecon.2020.106775>
- Janković Šoja, S., Anokić, A., Bucalo Jelić, D., & Maletić, R. (2016). Ranking EU countries according to their level of success in achieving the objectives of the sustainable development strategy. *Sustainability*, 8(4), <https://doi.org/10.3390/su8040306>
- Lafortune, G., Fuller, G., Bermont Diaz, L., Kloke-Lesch, A., Koundouri, P., & Riccaboni, A. (2022). *Achieving the SDGs: Europe's Compass in a Multipolar World. Europe Sustainable Development Report 2022*. Paris: SDSN and SDSN Europe.
- Miola, A., & Schiltz, F. (2019). Measuring sustainable development goals performance: how to monitor policy action in the 2030 agenda implementation? *Ecological Economics*, 164(C). <https://doi.org/10.1016/j.ecolecon.2019.106373>
- OECD. (2022). *The Short and Winding Road to 2030: Measuring Distance to the SDG Targets*, Paris: OECD Publishing.
- Papadimitriou, E., Neves, A. R., & Becker, W. (2019). *JRC Statistical Audit of the Sustainable Development Goals Index and Dashboards*. Luxembourg: Publications Office of the European Union.
- Sachs, J. D., Lafortune, G., Fuller, G., & Drumm, E. (2023). *Implementing the SDG Stimulus. Sustainable Development Report 2023*. Paris: SDSN, Dublin: Dublin University Press
- Sustainable Development Report. (2023). <https://www.sdgindex.org>
- United Nations. (2015). *Transforming Our World: the 2030 Agenda for Sustainable Development*. <https://www.refworld.org/docid/57b6e3e44.html>
- Van Norren, D. E. (2017). *Development as service*. Tilburg: Prisma Print.
- World Commission on Environment and Development – WCED. (1987). *Our Common Future*. Oxford: Oxford University Press.



# Factors Determining Inflation in the American Economy: A Quantitative Analysis

Tsvetomir Tsvetkov<sup>1</sup>   
Irina Atanasova<sup>2</sup> 

Received: July 13, 2023  
Accepted: October 31, 2023  
Published: March 16, 2024

## Keywords:

Inflation;  
United States;  
Fiscal stimulus;  
Supply contraction;  
Market failures;  
Structural imbalances



Creative Commons Non  
Commercial CC BY-NC: This  
article is distributed under the terms of  
the Creative Commons Attribution-Non-  
Commercial 4.0 License (<https://creativecommons.org/licenses/by-nc/4.0/>) which  
permits non-commercial use, reproduc-  
tion and distribution of the work without  
further permission.

**Abstract:** *This paper aims to examine the factors that determine inflation in the United States. To accomplish the research objective, a quantitative analysis employing the linear least squares method is conducted. The authors present empirical arguments that the factors that determine inflation in the US are structural-cost ones.*

## 1. INTRODUCTION

In 2021, inflation in the US began to grow at unprecedented rates, reaching 6.6 percent on an annual basis in 2022. The recorded annual inflation in the US is unprecedentedly high for the US economy. Therefore, many leading experts such as Summers (2021), Blanchard (2021), Stiglitz and Regmi (2022), and others have put the question of the causes of inflation in the US at the center of academic and political debate.

Thus, clarifying the factors that determine inflation in the US becomes an important discussion issue. This paper aims to examine the drivers of inflation in the US economy in the period from 2021 until the beginning of 2023. The main thesis of the authors is that inflation in the US has a structural-expenditure nature, not a monetary nature. The monetary manifestation of inflation is a consequence, not a main cause for the inflation in the United States. Proving the author's thesis requires testing two hypotheses. One hypothesis is that the rise in US inflation is due to structural cost factors, such as rising food, electricity and gas prices, which suggests that inflation in the American economy stems from cost-structural factors that arise from supply contraction, leading to disruptions in trade chains.

The other hypothesis is that inflation in the US is due to the increase in the money supply and fiscal stimulus.

<sup>1</sup> Sofia University "St. Kliment Ohridski", Sofia, Bulgaria

<sup>2</sup> Southwest University "Neofit Rilski", Blagoevgrad, Bulgaria

## 2. LITERATURE REVIEW

The determinants of inflation in the United States are a subject of extensive debate among researchers, with a wide range of opinions. Scholars such as Summers (2021), Blanchard (2021), Borrallo et al. (2021), Harding et al. (2023), Barnichon et al. (2021), Jordà et al. (2022), Bianchi and Fisher (2021) argue that the primary factor driving the rise in inflation is the increase in government spending and fiscal stimulus implemented by the US government to counteract the economic contraction caused by the COVID-19 pandemic. Additionally, Borrallo et al. (2021) suggest that wage dynamics and inflation expectations, along with fiscal stimulus and supply chain disruptions, play a role in determining inflation.

Stiglitz and Regmi (2022) propose that supply chain disruptions contribute to inflation by limiting the availability of goods and services. They further emphasize that other factors influencing inflation in the US economy include structural distortions in demand, a labor market transforming, and market forces that promote inflation. Stiglitz and Regmi argue that inflation in the US has become persistent due to the ongoing conflict in Ukraine. Konczal (2023) supports this view and adds that housing prices, energy costs, and food prices significantly contribute to inflation. Furthermore, Konczal (2022) identifies high corporate profit margins as another factor driving unprecedented inflation in the US. Similarly, Brainard (2022) defends a similar thesis regarding the influence of high corporate profit margins on inflation. Stiglitz, Regmi, and Konczal reject the notion that inflation in the US is primarily caused by fiscal stimulus from the government.

On the other hand, authors such as Waller (2022), Nersisyan and Wray (2022) emphasize that inflation is driven by shrinking supply and increasing demand, leading to bottlenecks in trade chains, particularly in the context of rising wages. Ball et al. (2022) argue that tightening labor markets and the transmission of past shocks to the present contribute to inflation. Bolhuis et al. (2022) specifically attribute the rise in inflation to increasing housing rental prices.

In summary, two main theses have been put forth to explain the unprecedented inflation in the American economy. One thesis attributes the primary cause to increased government spending, while the other thesis points to structural supply distortions arising from trade chain disruptions during the pandemic and fluctuations in energy and fuel prices.

## 3. METHODOLOGY AND DATA

The study period spans from January 2021 to February 2023, and the data used in the analysis have been monthly and seasonally smoothed. Inflation is measured using the Consumer Price Index (CPI) and is represented as a monthly percentage change. The monthly percentage changes in food prices, gas prices, and electricity prices are also considered. The monetary aggregates M2, including both the overall money supply and the money supply in circulation, are measured as monthly percentage changes. Government spending is measured as a monthly percentage change as well. The labor market, which reflects the impact of wages, is measured by the number of unemployed individuals in one job and expressed as a percentage change monthly.

The primary data for this analysis are sourced from reputable institutions such as the US Bureau of Labor Statistics, Federal Reserve Bank of Cleveland, Federal Reserve Bank of Philadelphia, and the USA Spending website.

The measurement and determination of factors influencing inflationary dynamics are typically carried out using the method of least squares. Researchers such as [Lim and Papi \(1997\)](#) utilize the method to determine the factors affecting inflation. [Harding et al. \(2023\)](#) highlight the use of non-linear models, which assign greater significance to inflationary factors in the inflation formation process.

To ensure the appropriateness of the stochastic dynamics within the aggregate statistical sample, the data must conform to a Gaussian normal distribution. [Dickey and Fuller \(1981\)](#) describe this distribution using the following logic:

$$Y_t = \alpha + \rho Y_{t-1} + e; (t = 1, 2, \dots n) \tag{1}$$

Where:  $Y_t$  – dynamic order;  $e$  – noise;  $\alpha$  and  $\rho$  are parameters that indicate whether  $Y_t$  fits a Gaussian normal distribution. The dynamic range must be such that the data adequately fits a  $(\alpha, \rho) \leq 0,1$  Gaussian normal distribution over time.

The least squares method can be expressed using the following equation:

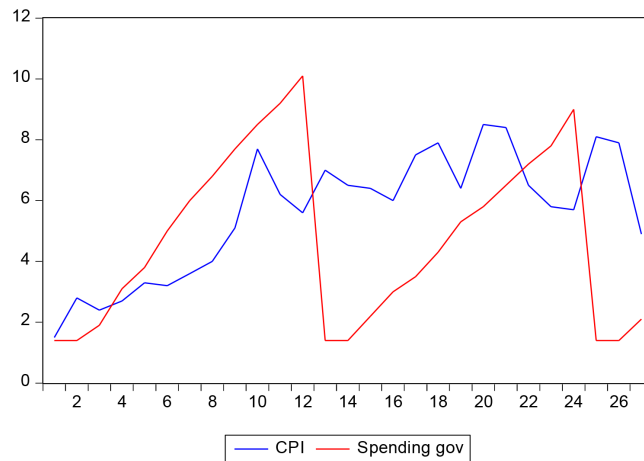
$$Y_i = \alpha + \beta X_i + \varepsilon_i \tag{2}$$

Where  $Y_i$  is the result of the impact of a given factor;  $X_i$  is a factor;  $\alpha$  and  $\beta$  are parameters;  $\varepsilon_i$  is a term of the equation.

#### 4. RESULTS AND DISCUSSION

The scientific discussion examining the factors influencing inflation in the United States suggests that inflation (CPI) is primarily driven by excessive government spending (spending gov). Consequently, we can represent the first equation in the following form:

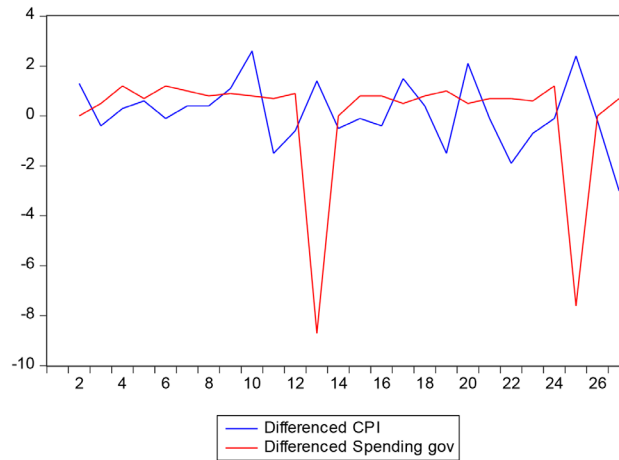
$$CPI = \alpha + \beta_{Spending\_gov} + \varepsilon \tag{3}$$



**Figure 1.** Stationarity test - CPI and Spending gov.

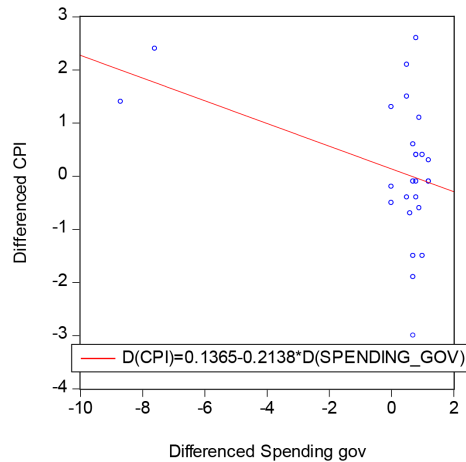
**Source:** Federal Reserve Bank of Cleveland; USA Shipping gov.; author’s calculations

The stationarity test indicates that mathematical transformations are necessary to fulfill the requirement of a Gaussian normal distribution over time (Figure 1). Following these transformations, the variables exhibit a response that aligns with a Gaussian normal distribution (Figure 2).



**Figure 2.** Stationarity test - CPI and Spending gov.

**Source:** Federal Reserve Bank of Cleveland; USA Shipping gov.; author's calculations



**Figure 3.** The effect of government spending (Spending gov.) on inflation (CPI)

**Source:** Author's calculations

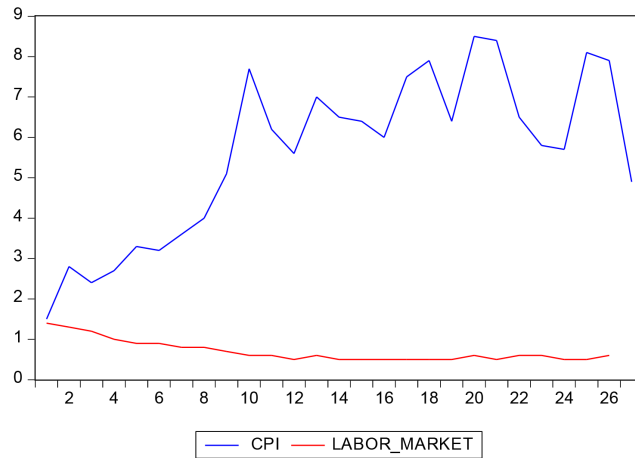
A unit increase in government spending reduces US inflation by 0.21 percent (Figure 3). Although this effect of government spending on inflation is statistically significant, it only explains 0.15 of the overall inflation dynamics in the US economy. Notably, the crucial empirical finding is that an increase in government spending does not result in inflationary pressures.

Another factor cited as a cause of inflation is the labor market.

$$CPI = \alpha + \beta_{Labor\_market} + \varepsilon \quad (4)$$

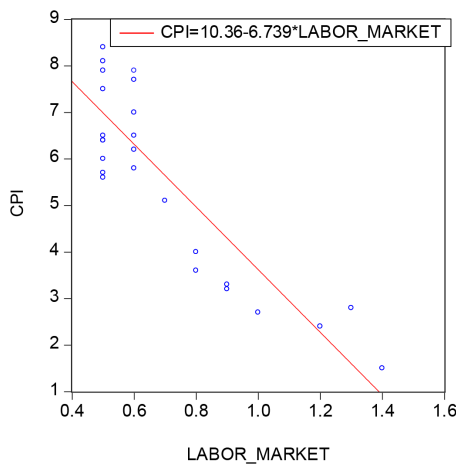
Both variables, namely the increase in newly created jobs and the preservation of jobs during the pandemic, satisfy the requirement for a Gaussian normal distribution (Figure 4). The analysis reveals that these labor market dynamics lead to a significant decrease in inflation in the American economy (Figure 5).

The analysis reveals that job growth in the U.S. economy explains a substantial portion, specifically 74 percent, of the variation in U.S. inflation. This finding indicates that the expansion of employment and the increased production of goods and services have a significant influence on restraining the growth of inflation.



**Figure 4.** Stationarity test - CPI and Labor\_market

Source: Federal Reserve Bank of Cleveland; US Bureau of Labor Statistics; author’s calculations



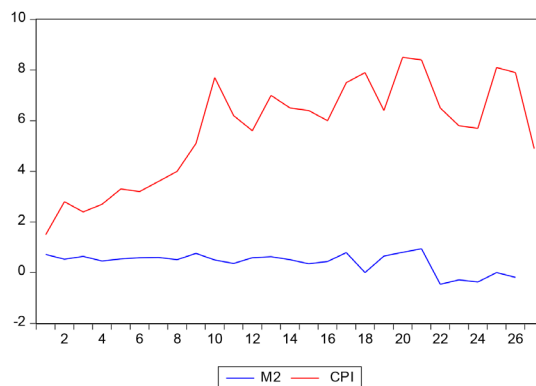
**Figure 5.** The effect of the labor market (Labor\_market.) on inflation (CPI)

Source: Author’s calculations

The money supply is an important determinant of inflation.

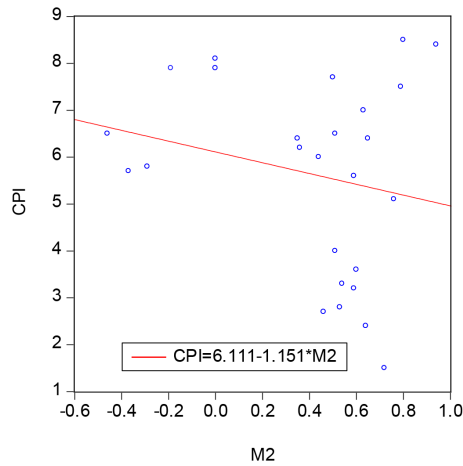
$$CPI = \alpha + \beta_{M2} + \varepsilon \tag{5}$$

The two variables correspond to a Gaussian normal distribution (Figure 6).



**Figure 6.** Stationarity test - CPI and monetary aggregates M2

Source: Federal Reserve Bank of Cleveland; Federal Reserve Bank of St. Louis; author’s calculations



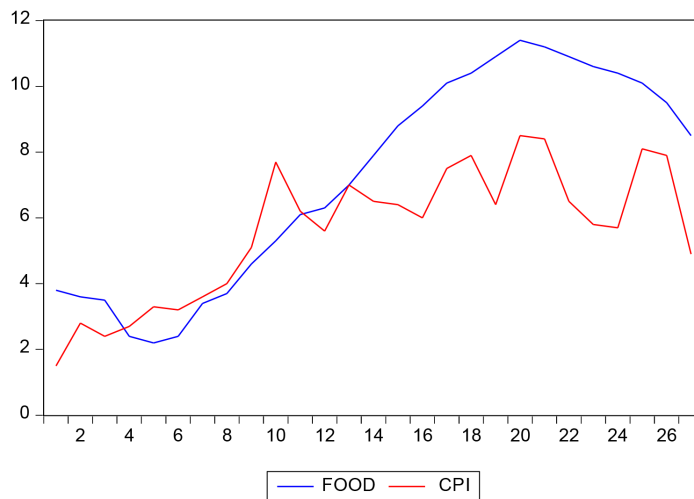
**Figure 7.** The effect of money supply (M2) on inflation (CPI)

**Source:** Author’s calculations

The analysis reveals a surprising finding that the money supply has a statistically insignificant effect on inflation (Figure 7). This result suggests that changes in the money supply do not have a significant impact on inflation in the U.S. economy. Consequently, this empirical evidence allows for the argument that inflation in the U.S. is not primarily caused by an excessive money supply.

On the other hand, the analysis highlights that food prices play an important role in driving the increase in inflation.

$$CPI = \alpha + \beta_{Food} + \varepsilon \tag{6}$$



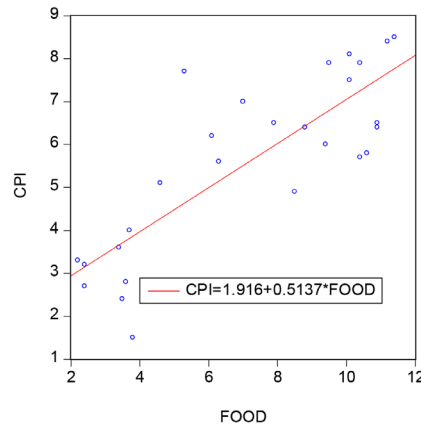
**Figure 8.** Stationarity test - CPI and Food

**Source:** Federal Reserve Bank of Cleveland; author’s calculations

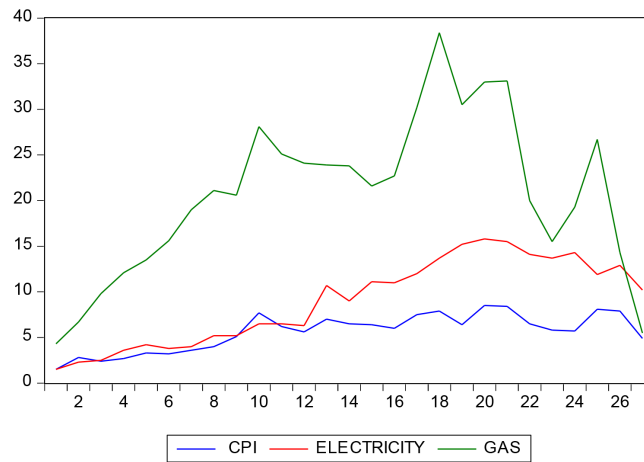
The analysis indicates that both variables, namely food prices and inflation, exhibit stationarity (Figure 8). Furthermore, the study reveals that an increase in food prices leads to an increase in inflation (Figure 9). This finding suggests that changes in food prices have a significant impact on overall inflation levels in the studied context. Additionally, it is noted that food prices contribute significantly to the deviation of inflation growth, meaning that fluctuations in food prices have a substantial effect on the variation in inflation rates.



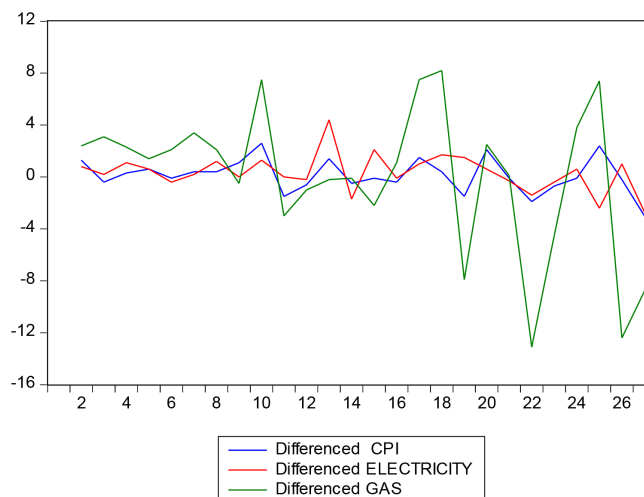
However, it is observed that the variables representing the price of gas and the price of electricity do not satisfy the requirement for a Gaussian distribution (Figure 10). As a result, these variables transform (Figure 11).



**Figure 9.** The effect of food prices on inflation (CPI)  
 Source: Author's calculations



**Figure 10.** Stationarity test - CPI, gas, petrol, and electricity  
 Source: Federal Reserve Bank of Cleveland; author's calculations

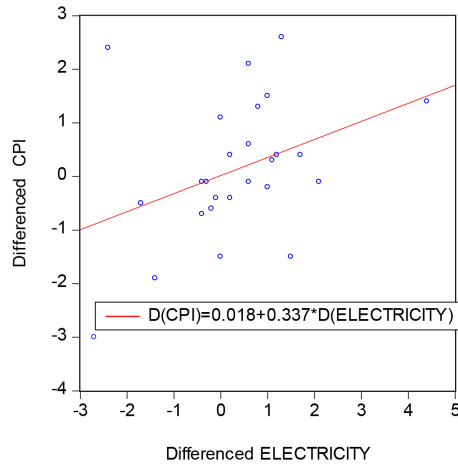


**Figure 11.** Stationarity test - CPI, gas, petrol, and electricity  
 Source: Federal Reserve Bank of Cleveland; author's calculations

To analyze the functional linear relationship between electricity prices and inflation, the following equation is considered:

$$CPI = \alpha + \beta_{Electricity} + \varepsilon \tag{7}$$

It implies that there is a relationship between the two variables, and the equation is used to explore and quantify the nature and extent of this relationship. The price of electricity leads to an increase in inflation (Figure 12).



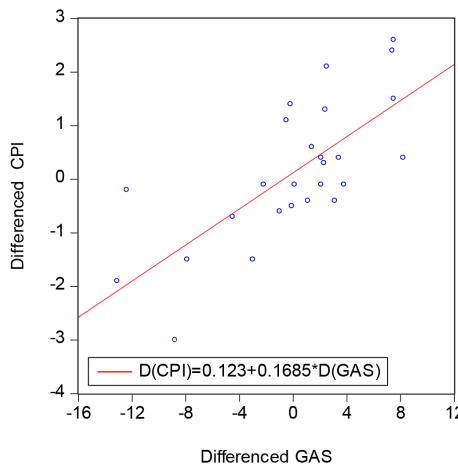
**Figure 12.** The effect of electricity prices on inflation (CPI)

**Source:** Author’s calculations

Gas prices are identified as a crucial component of inflation, as indicated by the following equation:

$$CPI = \alpha + \beta_{Gas} + \varepsilon \tag{8}$$

Equation (8) signifies the significance of gas prices in influencing inflation. It suggests that changes in gas prices have a notable impact on the overall inflation levels. Moreover, the analysis reveals that almost half of the deviation in inflation growth can be attributed to gas prices (Figure 13).



**Figure 13.** The effect of gas prices on inflation (CPI)

**Source:** Author’s calculations

## 5. CONCLUSION

The analysis of factors influencing inflation in the US reveals that the increase in gas prices, electricity prices, and food prices play significant roles. These factors point to the existence of structural cost inflation within the US economy. However, the empirical results provide evidence to reject the hypothesis that government fiscal stimulus is the primary driver of inflationary growth in the US.

Instead, the findings support the thesis that inflation in the USA is a consequence of structural disruptions in trade chains. These disruptions lead to a structural change in demand and are accompanied by supply contractions and increases in energy prices. This whole process is deepened by the war in Ukraine.

These insights suggest that a combination of structural factors related to trade disruptions, changes in demand, and energy price increases are key drivers of inflation in the US. It highlights the complex interplay of various factors contributing to the inflationary dynamics observed in the economy.

## References

- Ball, L., Leigh, D., & Mishra, P. (2022). Understanding US Inflation During the COVID Era. IMF Working Paper. <https://www.imf.org/en/Publications/WP/Issues/2022/10/28/Understanding-US-525200>
- Barnichon, R., Oliveira, L., & Shapiro, A. (2021). Is the American Rescue Plan Taking Us Back to the '60s? Federal Reserve Bank of San Francisco: *FRBSF Economic Letter*. <https://www.frbsf.org/economic-research/publications/economic-letter/2021/october/is-american-rescue-plan-taking-us-back-to-1960s/>
- Bianchi, F., & Fisher, J. (2021). Some inflation scenarios for the American Rescue Plan Act of 2021. Federal Reserve Bank of Chicago: Chicago Fed Letter 453. <https://www.chicagofed.org/publications/chicago-fed-letter/2021/453>
- Blanchard, O. (2021). In defense of concerns over the \$1.9 trillion relief plan. Real-Time Economic Issues Watch: Peterson Institute for International Economics. blog, May 12, available online, <https://www.piie.com/blogs/realtime-economics/defense-concerns-over-19-trillion-relief-plan>
- Bolhuis, M., Cramer, J., & Summers, L. (2022). Comparing Past And Present Inflation. Massachusetts Avenue Cambridge, MA: NBER Working Paper Series. [https://www.nber.org/system/files/working\\_papers/w30116/w30116.pdf](https://www.nber.org/system/files/working_papers/w30116/w30116.pdf)
- Borrillo, F., Buesa, A., & Párraga, S. (2021). Inflation in the United States: Recent Developments and Outlook. Available at SSRN: [https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=3935712](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3935712)
- Brainard, L. (2022). Bringing Inflation Down. New York: Clearing House. Bank Policy Institute 2022 Annual. <https://www.federalreserve.gov/newsevents/speech/brainard20220907a.htm>
- Dickey, D. A., & Fuller, W. A. (1981). Likelihood Ratio Statistics for Autoregressive Time Series with a Unit Root. *Econometrica*, 49(4), 1057–1072. <https://doi.org/10.2307/1912517>.
- Harding, M., Lindé, J., & Trabandt, M. (2023). Understanding Post-COVID Inflation Dynamics. BIS Working Papers No. 1077 ISSN 1682-7678 (online). <https://www.bis.org/publ/work1077.pdf>
- Jordà, Ò., Liu, C., Nechio, F., & Rivera-Reyes, F. (2022). Why Is US Inflation Higher than in Other Countries? Federal Reserve Bank of San Francisco: FRBSF Economic Letter.

- <https://www.frbsf.org/economic-research/publications/economic-letter/2022/march/why-is-us-inflation-higher-than-in-other-countries/>
- Konczal, M. (2022). Why Market Power Matters for Inflation. New York: Roosevelt Institute. <https://rooseveltinstitute.org/publications/why-market-power-matters-for-inflation/>
- Konczal, M. (2023). Inflation in 2023: Causes, Progress, and Solutions. New York: Roosevelt Institute. <https://rooseveltinstitute.org/publications/inflation-in-2023-causes-progress-and-solutions/>
- Lim, C., & Papi, L. (1997). An Econometric Analysis of the Determinants of Inflation in Turkey. International Monetary Fund. <https://www.imf.org/external/pubs/ft/wp/wp97170.pdf>
- Nersisyan, Y., & Wray, L. (2022). What's Causing Accelerating Inflation: Pandemic or Policy Response? Annandale-on-Hudson, NY: Levy Economics Institute. [https://www.levyinstitute.org/pubs/wp\\_1003.pdf](https://www.levyinstitute.org/pubs/wp_1003.pdf)
- Stiglitz, J., & Regmi, I. (2022). The Causes of and Responses to Today's Inflation. New York: Roosevelt Institute. <https://rooseveltinstitute.org/publications/the-causes-of-and-responses-to-todays-inflation/>
- Summers, L. H. (2021). Opinion: The Biden stimulus is admirably ambitious. But it brings some big risks, too. The Washington Post. <https://www.washingtonpost.com/opinions/2021/02/04/larry-summers-biden-covid-stimulus/>
- Waller, C. (2022). Responding to High Inflation, with Some Thoughts on a Soft Landing. Frankfurt, Germany: Institute for Monetary and Financial Stability Goethe University. <https://www.bis.org/review/r220601g.htm>



# Small and Medium-Sized Businesses in Albania Prefer Progressive Tax or Flat Tax

Mimoza Zeneli<sup>1</sup>   
Almarin Frakulli<sup>2</sup> 

Received: September 11, 2023  
Accepted: November 14, 2023  
Published: March 16, 2024

## Keywords:

Progressive tax;  
Flat tax;  
Fiscal legislation;  
Incomes;  
SME



Creative Commons Non Commercial CC BY-NC: This article is distributed under the terms of the Creative Commons Attribution-Non-Commercial 4.0 License (<https://creativecommons.org/licenses/by-nc/4.0/>) which permits non-commercial use, reproduction and distribution of the work without further permission.

**Abstract:** A progressive and flat tax system is widely debated not only in public finance but usually as a political issue in Albania. A progressive tax has been applied in Albania in recent years. Many researchers in Albania have studied the effect of the flat and progressive tax on public finances, but what we will bring in this paper is the point of view with which small and medium businesses in Albania consider the effect of the tax on the income of their companies.

Based on the results of the survey of Structural Statistics, for the year 2021, 99.8% of active enterprises are SMEs. This important fact intrigued us to study the effect of taxes on SME income as well as their opinion on each tax. In order to see the effect of the tax system, the analysis of the data collected from 200 SMEs (through questionnaires) for the main indicators such as progressive taxation, and simplified tax on small business was carried out. The descriptive analysis of the data collected as well as the confidence interval estimation for the VAT rate preferred, are going to generate some conclusions and recommendations for policymakers.

## 1. INTRODUCTION

The debate on the flat or progressive tax has been a political issue that has accompanied the changes of governments in Albania. In 2007, by law no. 9766, from 07.09.2007, a flat tax of 10% was applied for the first time in Albania, while in 2013, with a change of government, a progressive tax was introduced. In fact, it is difficult to show the pure impact of a flat or progressive tax on GDP.

Positive and negative sides of the flat tax. It is easy to understand, has a low cost to implement, businesses are more confident in their decision-making due to the recognition and ease of flat tax abatement, etc. Besides the positive sides, there are also negative sides. The flat tax disproportionately impacts the middle class and those with lower income levels.

Positive and negative sides of a progressive tax. The application of a progressive tax reduces the tax burden on people who are less able to pay. This leaves more money in the pockets of low-income earners, who are likely to spend more money on essential goods and stimulate the economy in the process.

A progressive tax system also tends to collect more tax than a flat tax, since the highest percentage of tax is levied on those with the highest amount of money. It creates a system full of bureaucracy. It creates tax evasion. A progressive tax also results in the largest amount of funds being used to finance public services, such as road maintenance and public safety, so this tax is indirectly returned to citizens.

<sup>1</sup> Business University Collage of Albania, Rruga Vangjel Noti, Tirana, Albania

<sup>2</sup> Metropolitan University of Tirana, Rruga Sotir Kolea, Tirana, Albania

Based on the advantages and disadvantages of the flat and progressive tax, it is not easy to determine which type of tax is appropriate at the current level of development in Albania.

Both types of taxes have been implemented in Albania, first the flat tax and finally the progressive tax. Many experts have analyzed their effects and reached different conclusions. In general, these studies start from the perspective of the impact of the tax on GDP.

We think that, in order to give an accurate conclusion on the right type of tax, their effect on the business as the subject that is directly impacted by this tax should be analyzed.

## **2. FLAT AND PROGRESSIVE TAX IMPACT STUDIES**

According to [Elezi \(2014\)](#), the flat tax has had a positive effect on GDP growth only in the first year of implementation, while in the other years, there has been a decrease. The same can be said about the level of employment in the private sector, which increased in the first year of the implementation of the flat tax, while in the following years it decreased.

In the study by [Bardhi \(2017\)](#), a theoretical analysis was made for the implementation of the progressive or flat tax. Based on the economic conditions of the country, the culture of taxpayers, and the transitional period that the country is going through, it was concluded that the flat tax has an advantage over the progressive tax because it taxes all businesses at the same percentage. Even though the percentage is the same, the flat tax itself is progressive, since those who receive more pay more.

[Kraja et al. \(2023\)](#) analyzed the impact of the flat tax (2007-2013) and the impact of the implemented progressive tax (2014-2021) on GDP. They concluded that both taxes have a positive impact on the country's economy, but the progressive tax has a slightly higher positive impact than the flat one. In the first years of implementation, the progressive tax has a smaller impact than the flat one, but afterward, its impact is higher.

Based on the above, we conclude that many analyses have been carried out referring to the impact of the flat or progressive tax on the country's GDP. In general, all studies have looked at the impact of the tax on public revenues. To judge comprehensively, in addition to measuring the impact of the tax on the country's economy, the effect of taxes on business income must first be studied as those directly affected by the tax. What is their opinion on the flat or progressive tax?

More than the tax changes, which are happening more often recently in Albania and which have not brought more income, the fiscal scheme and system must be changed. However, we think that it is time to pay more attention to the implementation regime of the fiscal system than to the type of tax.

## **3. SME REPRESENTATIVES OPINION ABOUT THE FISCAL SYSTEM IN ALBANIA**

As we mentioned above, many studies have been conducted to show the effect of the tax on GDP. In this article, we will show what is the opinion of the SME representatives on the fiscal system and its implementation regime. For this purpose, the opinion of 200 SME representatives was gathered. We have chosen to analyze the opinion of SME representatives since about 76% of businesses in Albania are small and medium ([INSTAT, 2023](#)). Referring to INSTAT data, 505,186 companies were registered as SMEs in 2021, while the total number of enterprises in the same year was 664,217.

#### 4. THE COMPOSITION OF THE SAMPLE

The sample size was 200 small and medium enterprises. From the data processing, we find that 79 interviewees are women, which represents about 39% of the respondents and 121 interviewees are men, or about 61% of the respondents. This fact is obvious since in Albanian companies (enterprises) most of the management positions are held by men.

About 34.5% of the respondents are up to 30 years old, 30.5% are in the age group of 31-40 years old, and about 20.5% belong to the age group of 41-50 years old, about 13.5% of the interviewees are in the age group up to 51-60 years old and 1 % age group 61-65 years. About 52% of the companies participating in the sample carry out their activity in Tirana, 30% in Durrës, and 18% in Fier.

#### 5. DATA ANALYSIS AND THE RESEARCH QUESTIONS

Through the questionnaire, data related to income, expenses, number of employees, investments, hospital expenses, cultural expenses and other important data were collected in response to some research questions. In addition to the above, data on their opinion regarding the following has been collected and processed:

- a) How much are businesses involved in the preparation of fiscal legislation?
- b) Which tax model do you prefer?
- c) Which of the alternatives is more suitable for improving the tax system?
  - (i) Changing the income tax method
  - (ii) Changing the level of income tax
  - (iii) Improving the tax administration.
- d) In your opinion, what percentage rate do you believe is appropriate for VAT?

#### 6. RESULTS OF DATA ANALYSIS

**Question (a):** *Do you think that the tax revenues deposited in the state budget by SMEs are used to improve the general economic conditions of SMEs (business climate)?"*

The summarized results of the responses are presented below in Table 1. All the interviewees answered this question.

**Table 1.** Do you think that the tax revenues deposited in the state budget by SMEs are used to improve the general economic conditions of SMEs (business climate)?"

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	125	62.5	62.5	62.5
	Don't know	51	25.5	25.5	88.0
	Yes	24	12.0	12.0	100.0
	Total	200	100.0	100.0	

Source: Authors

Analyzing the data, it becomes evident that a significant proportion of business representatives believe that the taxes they pay are not utilized to enhance the overall business environment.

**Question (b):** *Which kind of taxation do you prefer?*

During the interview, we were interested in business preferences regarding the flat and progressive tax. There were three answer alternatives:

- a) Flat tax,
- b) Progressive tax,
- c) Indifferent.

We added the “indifferent” option as an alternative since during the piloting of the questionnaire there were business representatives who were not interested in the type of tax. The results after data processing show that 31% of businesses prefer the progressive tax, 55% prefer the flat tax, and 14% are indifferent to the type of tax.

**Question (c):** *Which option among the alternatives is better suited for enhancing the tax system?*

Through this question, we sought to indirectly understand in which part of the fiscal system there are gaps.

**Table 2.** Which option among the alternatives is better suited for enhancing the tax system?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Changing the income tax rate	40	19.5	19.5	19.5
	Changing the income tax method	61	30.0	30.0	50.5
	I don't know	22	11.0	11.0	61.5
	Improvement of tax administration	77	38.5	38.5	100.0
	Total	200	100.0	100.0	

Source: Authors

Referring to the data in Table 2, we notice that business dissatisfaction is mainly towards the tax administration, approximately 38.5%, followed by the alternative “Changing the income tax method” with 30%.

**Question (d).** *In your opinion, what percentage rate do you believe is appropriate for VAT?*

One of the aspects discussed by SME representatives is the percentage of VAT. In Albania, VAT is applied at the rate of 20% (Law no. 92/2014 “On tax on value added in the Republic of Albania”, p. 19). This level of VAT is considered high by SME representatives.

At the beginning of 2018, small and medium businesses were also included in the VAT declaration scheme. According to Albanian tax legislation, all businesses (regardless of size or legal status), that register a taxable income of at least 2 million lek, are included in the VAT scheme. This change caused many debates and dissatisfaction in the business environment, not only for the introduction of the business in the VAT declaration scheme but also for other issues such as the percentage rate of the simplified tax on small businesses, etc.

Based on this fact, the opinion of the SME representatives was drawn in the questionnaire as to what is the tax rate (%) of VAT that they are willing to pay.

From the data in Table 3, we notice that the average percentage for which the businesses expressed their willingness to pay is 10.1735 % (mean) and the standard deviation is 3.39% (McGraw-Hill, 1989, p. 13). Median is equal to 10%.



**Table 3.** Descriptive results for the response of the interviewees regarding the VAT rate

		Statistic	Std. Error	
What do you think should be the percentage rate of VAT?	Mean	10.1735	.33901	
	95% Confidence Interval for Mean	Lower Bound	9.5050	
		Upper Bound	10.8420	
	5% Trimmed Mean	10.2372		
	Median	10.0000		
	Variance	22.985		
	Std. Deviation	4.79431		
	Minimum	.00		
	Maximum	19.00		
	Range	19.00		
	Interquartile Range	5.38		

Source: Authors (SPSS Processing of data collected through the questionnaire)

The confidence interval for the average value of VAT declared by the SME representatives is calculated. With 95% certainty, we have enough evidence to believe that the VAT rate acceptable to businesses ranges from 9.505 % to 10.8420%.

## 7. CONCLUSION

The implementation of a tax, no matter how simple it is, will affect the whole or a significant part of society directly or indirectly. Therefore, at any time, initiatives must be accompanied by in-depth analysis and studies for the effect that the implementation of this tax has. Policymakers before approving fiscal changes must be clear about all the accompanying socioeconomic effects and use it during the preparation of the fiscal package in such a way that the fiscal package has as few negative socioeconomic effects as possible.

Different researchers have shown that both the flat tax and the progressive tax have a positive effect on GDP, regardless of whether the progressive tax has a greater effect. Both taxes have been implemented in Albania, but none of the studies clearly show which of the taxes is more successful. Referring to the analysis of the data collected from businesses according to which the VAT rate accepted by businesses is lower than what is applied, this makes us think that in the current conditions, it is more important for the government to focus on the regime of tax implementation than in the type of tax.

Approximately 39% of the SME representatives think that one of the factors that would improve the fiscal system in Albania is the improvement of the tax administration. So, their trust in the tax administration has decreased. Based on this fact, the government should strengthen the transparency of the tax authorities by adopting the highest standards of transparency.

Cross-referenced and repeated studies related to the effect on the budget of the fiscal system with studies on the effect of the fiscal system on business performance will ensure accuracy, transparency and safe implementation.

## References

- Bardhi, E. (2017). Albanian Economy: Proportional or Progressive Taxation?. *Mediterranean Journal of Social Sciences*, 8(1), 176.
- Elezi, T. (2014). Albanian fiscal system evaluation through some economic indicators. *European Scientific Journal*, 10(4), 173-183.
- INSTAT. (2023). [http://databaza.instat.gov.al/pxweb/sq/DST/START\\_\\_EE/SSE02/](http://databaza.instat.gov.al/pxweb/sq/DST/START__EE/SSE02/)
- Kraja, G., Lirëza, L., & Morselli, A. (2023). Comparative Study on Flat Tax and Progressive Tax in Albania. *Journal of Educational and Social Research*, 13(3), 354. <https://doi.org/10.36941/jesr-2023-0083>
- Law no. 92/2014 »On tax on value added in the Republic of Albania«
- McGraw-Hill. (1989). Complete Business Statistics.



# Renewable Energy Financing during the COVID-19 Pandemic: Obstacles and Solutions

Mert Topcu<sup>1</sup> 

Received: August 20, 2023

Accepted: November 14, 2023

Published: March 16, 2024

## Keywords:

Renewable energy financing;  
COVID-19



Creative Commons Non Commercial CC BY-NC. This article is distributed under the terms of the Creative Commons Attribution-Non-Commercial 4.0 License (<https://creativecommons.org/licenses/by-nc/4.0/>) which permits non-commercial use, reproduction and distribution of the work without further permission.

**Abstract:** *The renewable energy industry, whose global market size was estimated at US\$ 1030,95 billion in 2022, faced numerous obstacles including financing issues ranking at the top during the COVID-19 pandemic. Given the importance of the topic, this study addresses these obstacles as well as potential solutions to financing renewable energy during the COVID-19 outbreak. The study discusses that economic uncertainty, disruption of supply chains, reduced investor confidence, reduced demand for energy, and policy changes are among the major problems in renewable energy financing during the outbreak. The study also proposes global solutions in order to provide policy stability and a predictable policy environment.*

## 1. INTRODUCTION

The COVID-19 pandemic has had a substantial impact on the global economy and severely disrupted numerous industries, including the renewable energy sector (Hoang et al., 2021). The global energy demand has decreased due to the pandemic, and widespread financial uncertainty has made it difficult for renewable energy projects to secure financing (Karmaker et al., 2021). Despite these obstacles, the renewable energy sector has continued to expand, and financing for renewable energy projects has remained robust. Governments, financial institutions, and investors have acknowledged the significance of investing in renewable energy to facilitate the transition to a more sustainable future. Innovative financing models and policy measures have been implemented in this context to ensure that the renewable energy industry can continue to expand and contribute to a greener, more resilient global economy (Gollakota & Shu, 2023).

This study explores the various obstacles and solutions that have emerged in renewable energy financing during the COVID-19 pandemic. The rest of the study is structured as follows: Section 2 defines the potential obstacles and solutions for renewable energy financing. Finally, Section 3 gives concluding remarks.

## 2. THE OBSTACLES AND SOLUTIONS FOR RENEWABLE ENERGY FINANCING

### 2.1. Economic Uncertainty

Economic uncertainty is crucial for renewable energy financing during the COVID-19 period because it affects the availability of funding for renewable energy projects and investors' willingness to invest in them (Liu et al., 2022). As investors become more risk-averse and prioritize short-term financial stability, economic uncertainty can also lead to a decline in investments in renewable energy projects. This can result in a funding gap for renewable energy projects, thereby delaying the transition to a future based on clean energy. In addition, economic uncertainty can influence the

<sup>1</sup> Alanya Alaaddin Keykubat University, Department of Economics, 07425 Alanya, Antalya, Turkey

policy environment for renewable energy. Governments could shift their focus away from renewable energy policies and incentives in order to address the immediate economic effects of the pandemic (Bahar, 2020). This can make the funding gap for renewable energy projects even larger.

For renewable energy investments, it is imperative to reduce economic uncertainty and provide policy stability. This can be achieved by implementing policies like renewable energy targets, carbon pricing mechanisms, and government subsidies for renewable energy projects. In addition, governments can provide economic stimulus packages that prioritize clean energy infrastructure investments in order to support the transition to a low-carbon economy.

## 2.2. Disruption of Supply Chains

During the COVID-19 pandemic, the disruption of supply chains is relevant to renewable energy financing because it can cause delays in the construction of renewable energy projects and lead to higher costs, thereby threatening the financial viability of these projects (Moosavi et al., 2022). Various factors, such as travel restrictions, factory shutdowns, and labor shortages, have been exacerbated by the COVID-19 pandemic and can disrupt supply chains. Critical components of renewable energy projects, such as solar panels, wind turbines, and batteries, can be affected by supply chain disruptions in the renewable energy industry. Delays in the delivery of these components can cause construction delays and increase project costs, making it more difficult to secure financing for renewable energy projects. Additionally, disruptions in the supply chain can impact the availability and cost of financing for renewable energy projects. Potential supply chain risks may discourage lenders and investors from financing projects, thereby increasing the cost of financing (Betolli et al., 2023).

For renewable energy projects, resilient and diverse supply chains are required. This could entail procuring materials and equipment from multiple sources, establishing local supply chains, and investing in domestic manufacturing capabilities. Moreover, governments can support renewable energy projects by implementing policies and incentives that encourage the development of a resilient and diverse supply chain.

## 2.3. Reduced Investor Confidence

Investor confidence refers to the conviction that an investment will generate a profit, and a lack of investor confidence can make investors more risk-averse and reluctant to invest in renewable energy projects (Himanshu et al., 2021). Significant economic disruptions and uncertainty have been caused by the COVID-19 pandemic, which may reduce investor confidence in the renewable energy sector (Hoang et al., 2021). Prioritizing short-term financial stability, investors may be more hesitant to invest in long-term projects, such as renewable energy projects, in favor of short-term financial stability. This can lead to a funding gap for renewable energy projects, which can ultimately slow the transition to a future based on clean energy (Kaminker & Stewart, 2012). Moreover, diminished investor confidence can influence the accessibility and cost of financing for renewable energy projects. Significant market and economic risks may make lenders and investors hesitant to finance projects, which can increase the cost of financing as well as make obtaining financing more difficult (Seetharaman et al., 2019).

Notice that increasing investor confidence in the renewable energy industry is worth noting. This can be accomplished by implementing policies and incentives that provide a stable and

predictable policy environment, such as renewable energy targets, carbon pricing mechanisms, and government subsidies for renewable energy projects. In addition, renewable energy projects can adopt risk-mitigation strategies such as diversifying project portfolios, implementing risk management strategies, and partnering with seasoned developers and operators.

## 2.4. Reduced Demand for Energy

The COVID-19 pandemic has caused significant economic disruptions and alterations in consumer behavior, resulting in a decline in energy demand (Das et al., 2022). By selling electricity to utilities or other energy buyers, renewable energy projects generate revenue. A decrease in energy demand can result in a decrease in the price of electricity, which can influence the revenue streams of renewable energy projects. In addition, a reduction in energy demand can lead to a reduction in renewable energy production, suggesting that renewable energy projects may not be able to generate electricity at full capacity while diminishing the potential revenue of these projects. Moreover, lower energy demand can affect the financing of renewable energy projects. Significant market and economic risks may discourage lenders and investors from financing projects, which can hurt financing opportunities (Kumar & Majid, 2020; Peimani, 2018).

Increasing the energy demand is not always good for environmental quality. In that sense, promoting sustainable energy demand and consumption should be prioritized via energy-efficient policies and incentives, including building codes, energy efficiency standards, and consumer education programs. Furthermore, renewable energy projects can mitigate revenue risks by entering into long-term power purchase agreements, implementing energy storage solutions, and developing diversified portfolios of projects in different regions or energy markets.

## 2.5. Policy Changes

Government policies play a crucial role in facilitating the development and deployment of renewable energy projects, and policy changes can introduce uncertainty and risk for investors and lenders. The pandemic of COVID-19 has necessitated the implementation of policies addressing both economic recovery and the transition to a low-carbon economy. Nonetheless, policy changes can create uncertainty for renewable energy projects, which can affect their financial viability and the cost of financing. Changes in renewable energy targets, subsidies, or tax incentives, for instance, can influence the revenue streams of renewable energy projects, while changes in regulations or permit requirements can increase the cost and duration of project development. Changes in energy market structures or pricing mechanisms can affect the competitiveness of renewable energy projects (Gatzert & Vogl, 2016; Prasad et al., 2022; Qadir et al., 2021).

There must be a stable and predictable policy environment for renewable energy projects that can be accomplished through policies and incentives that encourage the development and deployment of renewable energy projects<sup>2</sup>. Moreover, governments should support renewable energy projects that lead to the development of a resilient and diversified supply chain, as well as fostering investor confidence in the renewable energy sector.

<sup>2</sup> Such as renewable energy targets, feed-in tariffs, tax incentives, and permitting and regulatory frameworks that encourage the development and deployment of renewable energy projects.

### 3. CONCLUSION

The COVID-19 pandemic has created significant barriers to renewable energy financing and, therefore, hurt businesses accordingly. The pandemic i) has created uncertainty in financial markets while making renewable energy financing difficult for those firms, ii) has disrupted supply chains, resulting in delays and increased costs in the delivery of renewable energy equipment, iii) has lowered investor confidence, which has led to a decrease in investments in renewable energy projects, iv) has reduced energy demand in some sectors, particularly transport, and manufacturing, affecting the revenue of renewable energy companies, and v) has prompted some governments to make policy changes during the pandemic, affecting the renewable energy sector. Notice also that, however, the long-term outlook for renewable energy remains positive, and many businesses and investors continue to see the industry as a profitable investment opportunity.

This study emphasizes the importance of global solutions to address the challenges posed by the emergence of the COVID-19 pandemic to provide policy stability and a predictable policy environment. We also discuss the possibility that these solutions may not be universally applicable and that their effects may vary depending on local contexts and the severity of the pandemic. The renewable energy sector is constantly adapting and evolving, requiring ongoing monitoring and assessment of the obstacles encountered in order to implement the most suitable solutions.

### References

- Bahar, H. (2020). The coronavirus pandemic could derail renewable energy's progress. *Governments Can Help*. Available online: <https://www.iea.org/commentaries/the-coronavirus-pandemic-could-derail-renewable-energy-s-progress-governmentscan-help> (accessed on 1 May 2023).
- Betolli, A., Heineke, F., Janecke, N., Nyheim, T., Schlosser, A., Spitzer, S., Staudt, C., Winter, R., & Zivansky, J. (2023). Renewable-energy development in a net-zero world: Disrupted supply chains. Available online: <https://www.mckinsey.com/industries/electric-power-and-natural-gas/our-insights/renewable-energy-development-in-a-net-zero-world-disrupted-supply-chains#/> (accessed on 2 May 2023).
- Das, D., Sarkar, A., & Debroy, A. (2022). Impact of COVID-19 on changing consumer behaviour: Lessons from an emerging economy. *International Journal of Consumer Studies*, 46(3), 692-715.
- Gatzert, N., & Vogl, N. (2016). Evaluating investments in renewable energy under policy risks. *Energy Policy*, 95, 238-252.
- Gollakota, A. R., & Shu, C. M. (2023). COVID-19 and energy sector: Unique opportunity for switching to clean energy. *Gondwana Research*, 114, 93-116.
- Himanshu, Ritika, Mushir, N., & Suryavanshi, R. (2021). Impact of COVID-19 on portfolio allocation decisions of individual investors. *Journal of public affairs*, 21(4), e2649.
- Hoang, A. T., Sandro Nižetić, Olcer, A. I., Ong, H. C., Chen, W.-H., Chong, C. T., Thomas, S., Bandh, S. A., & Nguyen, X. P. (2021). Impacts of COVID-19 pandemic on the global energy system and the shift progress to renewable energy: Opportunities, challenges, and policy implications. *Energy Policy*, 154, 112322. <https://doi.org/10.1016/j.enpol.2021.112322>
- Kaminker, Ch., & Stewart, F. (2012). The Role of Institutional Investors in Financing Clean Energy, OECD Working Papers on Finance, Insurance and Private Pensions, No. 23, OECD Publishing.

- Karmaker, C. L., Ahmed, T., Ahmed, S., Ali, S. M., Moktadir, M. A., & Kabir, G. (2021). Improving supply chain sustainability in the context of COVID-19 pandemic in an emerging economy: Exploring drivers using an integrated model. *Sustainable production and consumption*, 26, 411-427.
- Kumar, C. R., & Majid, M. A. (2020). Renewable energy for sustainable development in India: current status, future prospects, challenges, employment, and investment opportunities. *Energy, Sustainability and Society*, 10(2), 1-36.
- Liu, T., Nakajima, T., & Hamori, S. (2022). The impact of economic uncertainty caused by COVID-19 on renewable energy stocks. *Empirical Economics*, 62, 1495-1515.
- Moosavi, J., Fathollahi-Fard, A. M., & Dulebenets, M. A. (2022). Supply chain disruption during the COVID-19 pandemic: Recognizing potential disruption management strategies. *International Journal of Disaster Risk Reduction*, 102983.
- Peimani, H. (2018). Financial Barriers to Development of Renewable and Green Energy Projects in Asia. ADBI Working Paper 862. Tokyo: Asian Development Bank Institute. Available: <https://www.adb.org/publications/financial-barriers-development-renewable-greenenergy-projects-asia>
- Prasad, A., Loukoianova, E., Feng, A. X., & Oman, W. (2022). Mobilizing Private Climate Financing in Emerging Market and Developing Economies. IMF Staff Climate Note 2022/007, International Monetary Fund, Washington, DC.
- Qadir, S. A., Al-Motairi, H., Tahir, F., & Al-Fagih, L. (2021). Incentives and strategies for financing the renewable energy transition: A review. *Energy Reports*, 7, 3590-3606.
- Seetharaman, Moorthy, K., Patwa, N., Saravanan, & Gupta, Y. (2019). Breaking barriers in deployment of renewable energy. *Heliyon*, 5(1), e01166.







# Clean Energy Stock Indexes: Trends, Fluctuations, and Implications for Investors

Mariana Chambino<sup>1</sup> 

Rui Dias<sup>2</sup> 

Cristina Morais da Palma<sup>3</sup> 

Received: August 31, 2023

Accepted: February 26, 2023

Published: March 16, 2024

## Keywords:

Events for 2020 and 2022;  
Clean energy stock index;  
Persistence in returns;  
Portfolio diversification



Creative Commons Non Commercial CC BY-NC: This article is distributed under the terms of the Creative Commons Attribution-Non-Commercial 4.0 License (<https://creativecommons.org/licenses/by-nc/4.0/>) which permits non-commercial use, reproduction and distribution of the work without further permission.

**Abstract:** *The heightened attention towards clean energy markets has been spurred by COVID-19 and geopolitical concerns in 2022. This study investigates the persistence of the Nasdaq Clean Edge Green Energy, Wilder-Hill Clean Energy, S&P Global Clean Energy, iShares Global Clear Energy ETF, and Clean Energy Fuels stock indexes for the period from May 3, 2018, to May 2, 2023. The findings are mixed since long memories were observed throughout the tranquil period; therefore, the events of 2020 and 2022 did not accentuate persistence. Based on the findings, it can be inferred that the long-term predictability of clean energy markets has potential advantages for investors with a focus on environmentally sustainable investments. However, investors must be aware of market risks and volatility, especially during periods of economic or political instability. To reduce risk and increase returns, investors should diversify their portfolios across different clean energy indexes and other asset classes.*

## 1. INTRODUCTION

One of the fundamental concepts of financial theory concerns the efficiency of markets, where the prices of financial assets provide the appropriate signals for the purchase of resources. The hypothesis of market efficiency starts from the premise that an investor cannot obtain an extraordinary return adjusted to risk. However, some empirical studies have proven the opposite: that an investor may have a return above the market average (Dias et al., 2021, 2022; Dias, Heliodoro, Alexandre, Santos & Vasco, 2021; Santos et al., 2021).

Despite the impressive growth of the clean energy sector, traditional, dirty energy remains the world's main source of energy. Furthermore, because clean energy sources are frequently viewed as alternatives to dirty energy, the development and sustainability of the clean energy industry cannot be separated from traditional energy markets. In addition, the concept of decarbonization is gaining strength globally, particularly following the 2015 Paris climate agreement and COP26. Regulators, businesses, financial institutions and investors have all attempted to replace dirty energy with sustainable energy. Indeed, numerous experts believe that investing in clean energy is crucial for achieving the COP26 goals (Papageorgiou et al., 2017; Ren & Lucey, 2021, 2022; Farid et al., 2023).

There is a significant gap in the current literature that makes understanding the efficiency of the clean energy stock index difficult. This is an important issue in terms of green energy consumption, dirty energy, and the growth of renewable energy technologies. This issue's significance can be observed in several ways. Firstly, the efficiency of the clean energy stock market has the potential to have a direct impact on energy consumption and economic sectors, resulting

<sup>1</sup> Polytechnic Institute of Setúbal, (ESCE/IPS), 2910-761 Setúbal, Portugal

<sup>2</sup> Polytechnic Institute of Setúbal, (ESCE/IPS), 2910-761 Setúbal, Portugal; Center of Advanced Studies in Management and Economics, University of Évora, 7004-516 Évora, Portugal

<sup>3</sup> Polytechnic Institute of Setúbal, (ESCE/IPS), 2910-761 Setúbal, Portugal

in the creation of new jobs. Second, because market efficiency is directly related to the accuracy of price information, the effects of clean energy stock markets can be felt in dirty energy markets like crude oil. Third, the efficiency of the clean energy stock market can have a considerable impact on technological choices and renewable energy legislation, which can influence the direction of clean energy technology. Furthermore, the extent of market inefficiency might be a useful tool for market regulators. Regulators can identify areas for improvement and seek to establish a more efficient market for clean energy by identifying market inefficiencies. Faced with a gap in the literature, this article aims to study market efficiency and predictability in the clean energy stock indexes Nasdaq Clean Edge Green Energy (CELS), WilderHill Clean Energy (ECO), S&P Global Clean Energy (SPGTCLEE), iShares Global Clean Energy ETF (ICLN), and Clean Energy Fuels (CLNE) from May 3, 2018, to May 2, 2023.

This essay is structured into five pieces. Section 2 provides a comprehensive examination of the existing literature related to publications that discuss the potential of efficient market behavior in the global financial markets. Section 3 provides an overview of the technique employed and the data used in the study. The findings are presented in Section 4. The fifth section of the document concludes.

## 2. LITERATURE REVIEW

There has been a recent surge in the interest of portfolio managers towards clean energy stocks, primarily driven by the increased value associated with investments in clean energy stocks. Interestingly, recent research suggests that investing in clean energy businesses might reduce the risk of investing in the aggregate US stock market index. The value of investing in clean energy stocks has recently piqued the curiosity of portfolio managers. According to recent research, investing in clean energy firms might reduce investment risks in the global US stock market index (Uddin et al., 2019).

According to other research, clean energy stock indexes can be viewed as a hedge and safe harbor for crude oil and gold markets (Elie et al., 2019). The same authors argue that clean energy assets are attractive investment routes due to government subsidies that stabilize the cash flows of green companies. Clean energy reserves have characteristics of both the general stock market and energy products and include companies involved in renewable energies and related products and services. Participants in the clean energy market now include professional investors, resulting in less room for speculation in the market. The prices of clean energy shares can be driven by the interactions of market participants with various time horizons and information interpretations.

The authors Yang et al. (2016) investigated the persistence of China's oil prices and energy market shares using the MF-DFA method to test multifractality. The authors highlight the presence of long memories in the oil market, which is an important source of multifractality in the energy stock index. In addition, Shahzad et al. (2020) examined the market efficiency, in its weakest form, in the clean energy stock indexes of the US, Europe, and the rest of the world. The asymmetrical multifractality in the US clean energy stock index is due to fat tails and far-reaching correlation. However, in the European and world shares of clean energy, multifractality is due only to the distribution of the fat tail. We see greater efficiency in the upward trend of European and global clean stock markets, whereas, in the case of the US, the market is less efficient when it shows an upward trend.

Later, the authors, Yao et al. (2021), examined the persistence of China's clean energy stock indexes, suggesting that the clean energy stock market is far from efficient and exhibits significant asymmetries in both upward and downward fluctuations. While the authors Shen and Wang (2023) analyzed the multifractality of the Chinese energy futures market (EFM), the CSI Energy Index, and the CSI Mainland New Energy Theme Index. Empirical evidence suggests that the autocorrelations and cross correlations of the markets under consideration have asymmetrical multifractality and that the multifractality of cross correlations is produced principally by the fat tail distribution of the original series. Following the outbreak of COVID-19, the risks of the traditional energy stock market and the whole new energy market increased, while the risks of the entire EFM decreased.

In conclusion, understanding the efficiency of clean energy stock indexes is important for several reasons. First, as the world moves towards green energy consumption, it is important to understand how the clean energy market operates. This knowledge can assist investors in making informed investment decisions, which can have a significant impact on the development and growth of clean energy technologies. Secondly, understanding the efficiency of clean energy stock markets can help policymakers develop more effective policies to promote the growth of clean energy markets. Finally, understanding the efficiency of clean energy stock markets can provide a more comprehensive knowledge of how markets operate and the elements that influence their efficiency.

### 3. METHODOLOGY

#### 3.1. Data

Table 1 shows the price indexes of the Nasdaq Clean Edge Green Energy (CELS), WilderHill Clean Energy (ECO), S&P Global Clean Energy (SPGTCLEE), iShares Global Clean Energy ETF (ICLN), and Clean Energy Fuels (CLNE) stock indexes were studied from May 3, 2018, to May 2, 2023. To increase the robustness of the results, we divided the sample into two subperiods: the quiet period, which covers the years May 2018 to December 2019, and the stress period, which covers the years January 2020 to May 2023 and includes the events of 2020 and 2022. The prices are daily and were obtained from the Thomson Reuters platform.

**Table 1.** Indexes and countries used in this research

	Index	Country
CELS	Nasdaq Clean Edge Green Energy	USA
ECO	WilderHill Clean Energy	USA
SPGTCLEE	S&P Global Clean Energy	USA
ICLN	S&P Global Clean Energy ETF	USA
CLNE	Clean Energy Fuels	USA

Source: Own elaboration

#### 3.2. Methodology

The present study will be conducted in multiple phases. Firstly, we will present the return graphs to observe the dispersion in relation to the mean. To characterize the sample, we will utilize the primary measures of descriptive statistics and the Jarque and Bera (1980) adherence test. Additionally, we will be using Q-Q plots to evaluate whether the distributions are Gaussian. To assess the validity of the stationarity assumption in the time series, we will employ the panel unit root test proposed by Phillips and Perron (1988), which involves using both the Fisher Chi-square and Choi Z-statistics. The PP version, Fisher's Chi-square, also known as Pesaran

and Pesaran test, evaluates the cross-independence of data in a panel based on the Fisher Chi-square statistics. The Choi Z-stat test, proposed by Choi (2001), is used to examine the existence of cross-dependence in panel data. We will use the model Detrended Fluctuation Analysis (DFA) to answer the research question. DFA is a method of examining time dependency in non-stationarity time series. This method, which assumes that the time series are non-stable, avoids spurious results when the analysis focuses on the long-term relationships of the time series. The DFA interprets it as follows:  $0 < \alpha < 0.5$  anti-persistent series;  $\alpha = 0.5$  random walk series;  $0.5 < \alpha < 1$  persistent series. This technique investigates the relationship between  $x_k$  and  $x_{k+t}$  values at different times. The interpretation of the  $\alpha_{DFA}$  exponent is shown in Table 2.

**Table 2.** Detrended Fluctuation Analysis  $\alpha_{DFA}$

Exponent	Type of signal
$\alpha_{DFA} < 0.5$	long-range anti-persistent
$\alpha_{DFA} \simeq 0.5$	uncorrelated, white noise
$\alpha_{DFA} > 0.5$	long-range persistent

Source: Own elaboration

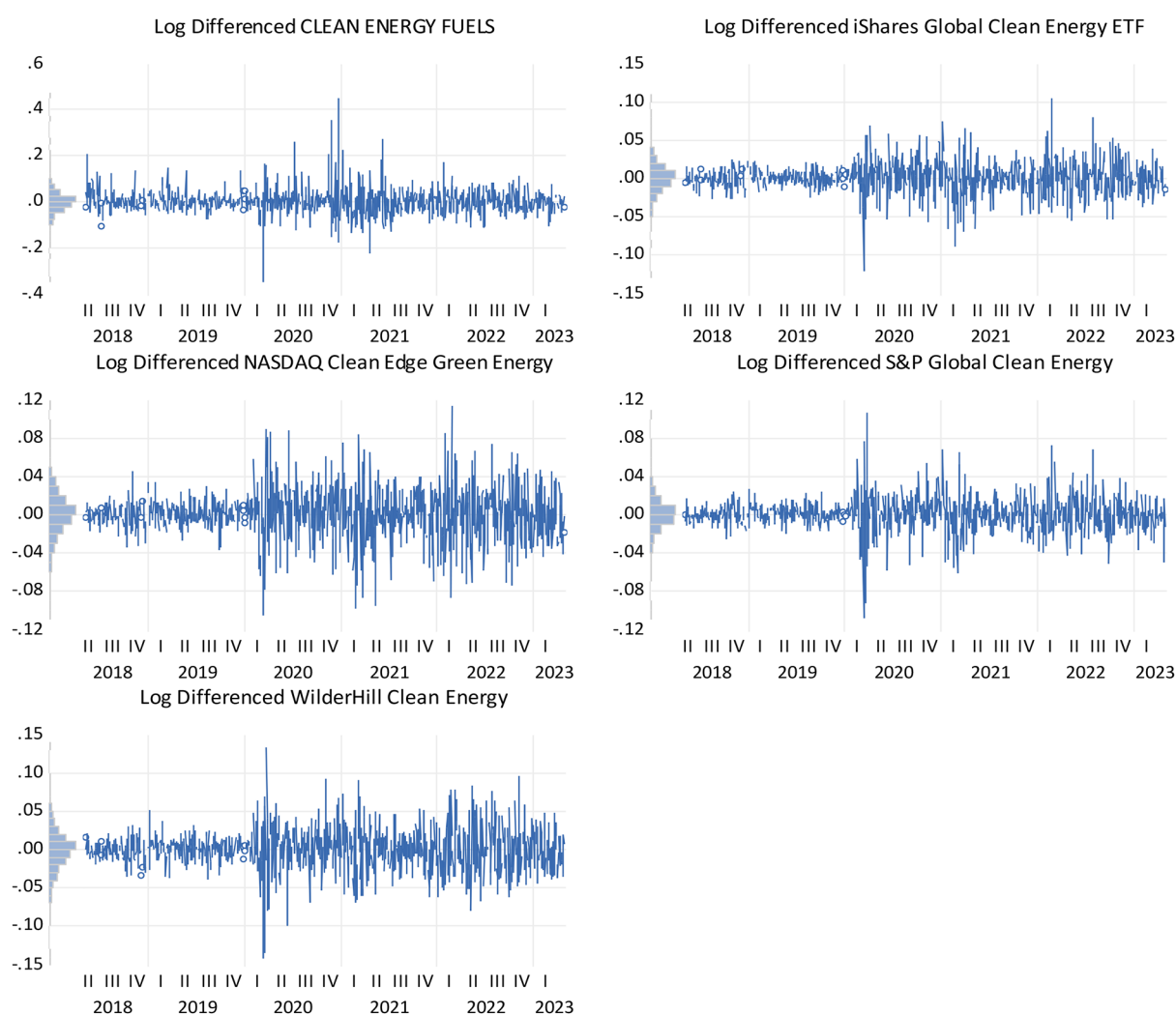
#### 4. RESULTS

Figure 1 shows the return evolution of the Nasdaq Clean Edge Green Energy (CELS), WilderHill Clean Energy (ECO), S&P Global Clean Energy (SPGTCLEE), iShares Global Clean Energy ETF (ICLN), and Clean Energy Fuels (CLNE) stock indexes from May 3, 2018, to May 2, 2023. The indexes under consideration clearly exhibit significant structural breakdowns, demonstrating the volatility to which these stock indexes were subjected, particularly in the first months of 2020, which coincides with the occurrence of the first wave of the COVID-19 pandemic and the oil price war between Russia and Saudi Arabia. Already in 2022, primarily in the first and second quarters of the year, fluctuations in the time series can be observed, indicating structural breakdowns, an event that occurs as a result of the Russian invasion of Ukraine and the resulting concerns about rising associated inflation. These findings are also validated, in part, by the authors Dias and Santos (2020a, 2020b), Pardal, Dias, Teixeira and Horta (2022), Dias, Pardal, et al. (2022), and Teixeira et al. (2022).

Table 3 shows a summary of the main descriptive statistics, in returns, of the time series regarding the Nasdaq Clean Edge Green Energy (CELS), WilderHill Clean Energy (ECO), S&P Global Clean Energy (SPGTCLEE), iShares Global Clean Energy ETF (ICLN), and Clean Energy Fuels (CLNE) stock indexes from May 3, 2018, to May 2, 2023. In terms of mean returns, the markets present positive values; in terms of standard deviation, the CLNE stock index reveals itself as the highest-risk index (0.040084). To determine whether the time series follows a normal distribution, we estimated the skewness and kurtosis and observed that they exhibit different values from 0 and 3, respectively. To corroborate those findings, we applied the Jarque and Bera (1980) adherence test and observed that  $H_0$  is rejected at a 1% significance level.

To validate the time series stationarity assumption, we estimate the Phillips and Perron (1988) panel unit root test, Fisher Chi-square, and Choi Z-stat for the Nasdaq Clean Edge Green Energy (CELS), WilderHill Clean Energy (ECO), S&P Global Clean Energy (SPGTCLEE), iShares Global Clean Energy ETF (ICLN), and Clean Energy Fuels (CLNE) stock indexes. To achieve stationarity, the original data is transformed into first-order logarithmic differences. The stationarity is then assessed by rejecting the null hypothesis ( $H_0$ ) at a significance level of 1%, as shown in Table 3.

Table 5 shows the results of the Detrended Fluctuation Analysis (DFA) exponents applied to the time series of the Nasdaq Clean Edge Green Energy (CELS), WilderHill Clean Energy (ECO), S&P Global Clean Energy (SPGTCLEE), iShares Global Clean Energy ETF (ICLN), and Clean Energy Fuels (CLNE) stock indexes. To increase the robustness of the results, the sample was separated into two subperiods: Tranquil and Stress (which include events from 2020 and 2022). We examined the presence of long memories in the stock indexes SPGTCLEE (0.58), CLNE (0.58), ECO (0.56), and ICLN (0.53), while the CELS (0.50) index shows signs of balance, i.e., the random walk hypothesis is not rejected. Already in the subperiod of Stress, which incorporates the events of 2020 and 2022 and has a time interval from January 2, 2020, to May 2, 2023, we witness the presence of persistence in the returns, namely in the SPGTCLEE index (0.57), ICLN (0.54), CELS (0.53), and ECO (0.52), while the CLNE (0.52) index is balanced, i.e., the random walk hypothesis is not rejected. Upon conducting a comparative analysis of the two subperiods, it was observed that there was no substantial increase in the persistence of clean energy indexes. Therefore, the findings of our research don't support the research question regarding the heightened persistence observed in the occurrences of 2020 and 2022. These results receive partial validation from the studies conducted by Guedes et al. (2022), Dias et al. (2022, 2023), Zebende et al. (2022), Santana et al. (2023), Dias, Chambino, et al. (2023) in the context of international financial markets.



**Figure 1.** Evolution, and returns, of the financial markets under analysis, from May 3, 2018, to May 2, 2023

**Source:** Own elaboration

**Table 3.** Summary table of descriptive statistics, in returns, in respect of the financial markets under analysis, from May 3, 2018, to May 2, 2023

	CLNE	ICLN	CELS	SPGTCLEE	ECO
Mean	0.000482	0.000369	0.000571	0.000412	0.000125
Std. Dev.	0.040084	0.014837	0.018702	0.012749	0.019707
Skewness	1.459962	-0.088204	-0.138421	0.055932	-0.094281
Kurtosis	24.10483	11.75285	9.279764	15.16997	10.20693
Jarque-Bera	34537.25	5831.294	3006.210	11269.51	3954.463
Probability	0.000000	0.000000	0.000000	0.000000	0.000000
Observations	1826	1826	1826	1826	1826

Source: Own elaboration

**Table 4.** Panel unit root tests applied to the financial markets under study during the period from May 3, 2018, to May 2, 2023

Method	Statistic	Prob.*	
PP - Fisher Chi-square	92.1034	0.0000	
PP - Choi Z-stat	-8.31597	0.0000	
Series	Prob.	Bandwidth	Obs.
CLNE	0.0001	49.0	1824
ICLN	0.0001	50.0	1824
CELS	0.0001	50.0	1824
SPGTCLEE	0.0001	51.0	1824
ECO	0.0001	50.0	1824

Notes: \* Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

Source: Own elaboration

**Table 5.** DFA results. The hypotheses are  $H_0: \alpha = 0.5$  and  $H_1: \alpha \neq 0.5$

Indexes	DFA Exponent (Tranquil)	DFA Exponent (Stress)
CLNE	0.58*** $\cong$ 0.0192 ( $R^2 = 0.98$ )	0.52 $\cong$ 0.0229 ( $R^2 = 0.99$ )
ICLN	0.53*** $\cong$ 0.0012 ( $R^2 = 0.98$ )	0.54** $\cong$ 0.0014 ( $R^2 = 0.99$ )
CELS	0.50 $\cong$ 0.0090 ( $R^2 = 0.98$ )	0.53** $\cong$ 0.0021 ( $R^2 = 0.98$ )
SPGTCLEE	0.58** $\cong$ 0.0101 ( $R^2 = 0.98$ )	0.57** $\cong$ 0.0093 ( $R^2 = 0.98$ )
ECO	0.56*** $\cong$ 0.0015 ( $R^2 = 0.99$ )	0.52** $\cong$ 0.0074 ( $R^2 = 0.98$ )

Note: The hypotheses are  $H_0: \alpha = 0.5$  and  $H_1: \alpha \neq 0.5$

Source: Own elaboration

## 5. CONCLUSION

The purpose of this research was to examine the potential impact of the events occurring in 2020 and 2022 on the long-term performance of the Nasdaq Clean Edge Green Energy (CELS), Wilder-Hill Clean Energy (ECO), S&P Global Clean Energy (SPGTCLEE), iShares Global Clean Energy ETF (ICLN), and Clean Energy Fuels (CLNE) stock indexes. The study period spanned from May 3, 2018, to May 2, 2023. The findings demonstrate mixed results, as we have confirmed that the occurrences in 2020 and 2022 did not intensify the persistence since the existence of long-term memories was previously noted during the Tranquil period. The findings show that there is potential for a certain level of predictability in the clean energy markets in the long term. This predictability might be useful for investors who have an avid interest in green investing. Furthermore, policymakers can use this information to enhance their decision-making processes regarding the promotion and facilitation of clean energy markets. This study offers significant contributions to the understanding of the behavior of clean energy stock indexes and their potential as a sustainable investing option. Further research may be based on these findings, exploring other factors that may influence the persistence of these indexes, such as technological advances and government policies.

## References

- Choi, I. (2001). iUnit Root Tests for Panel Data, *Journal of International Money and Finance*, 20, 249-272.
- Dias, R., Chambino, M., & Horta, N. H. (2023). Long-Term Dependencies in Central European Stock Markets : *A Crisp-Set*. 2(February), 10–17. <https://doi.org/10.58567/eal02010002>
- Dias, R., Heliodoro, P., Alexandre, P., Santos, H., & Vasco, C. (2021). Market Efficiency in Its Weak Form: the Pre-Covid and Covid Indonesia Analysis. 5th EMAN Conference Proceedings (Part of EMAN Conference Collection), October, 1–11. <https://doi.org/10.31410/eman.2021.1>
- Dias, R., Horta, N., & Chambino, M. (2023). Clean Energy Action Index Efficiency: An Analysis in Global Uncertainty Contexts. *Energies* 2023, 16, 18. <https://doi.org/https://doi.org/10.3390/en16093937>
- Dias, R., Pardal, P., Teixeira, N., & Horta, N. (2022). Tail Risk and Return Predictability for Europe's Capital Markets : An Approach in Periods of the. December. <https://doi.org/10.4018/978-1-6684-5666-8.ch015>
- Dias, R., Pereira, J. M., & Carvalho, L. C. (2022). Are African Stock Markets Efficient? A Comparative Analysis Between Six African Markets, the UK, Japan and the USA in the Period of the Pandemic. *Naše Gospodarstvo/Our Economy*, 68(1), 35–51. <https://doi.org/10.2478/ngoe-2022-0004>
- Dias, R., & Santos, H. (2020a). Stock Market Efficiency in Africa: Evidence From Random Walk Hypothesis. 6th LIMEN Conference Proceedings (Part of LIMEN Conference Collection), 6(July), 25–37. <https://doi.org/10.31410/limen.2020.25>
- Dias, R., & Santos, H. (2020b). The Impact of Covid-19 on Exchange Rate Volatility: an Econophysics Approach. 6th LIMEN Conference Proceedings (Part of LIMEN Conference Collection), 6(July), 39–49. <https://doi.org/10.31410/limen.2020.39>
- Dias, R., Santos, H., Alexandre, P., Heliodoro, P., & Vasco, C. (2021). Random Walks and Market Efficiency Tests: Evidence for Us and African Capital Markets. 5th EMAN Selected Papers (Part of EMAN Conference Collection), October, 17–29. <https://doi.org/10.31410/eman.s.p.2021.17>
- Dias, R. T., Pardal, P., Santos, H., & Vasco, C. (2021). Testing the Random Walk Hypothesis for Real Exchange Rates (Issue June, pp. 304–322). <https://doi.org/10.4018/978-1-7998-6926-9.ch017>
- Elie, B., Naji, J., Dutta, A., & Uddin, G. S. (2019). Gold and crude oil as safe-haven assets for clean energy stock indices: Blended copulas approach. *Energy*, 178. <https://doi.org/10.1016/j.energy.2019.04.155>
- Farid, S., Karim, S., Naeem, M. A., Nepal, R., & Jamasb, T. (2023). Co-movement between dirty and clean energy: A time-frequency perspective. *Energy Economics*, 119. <https://doi.org/10.1016/j.eneco.2023.106565>
- Guedes, E. F., Santos, R. P. C., Figueredo, L. H. R., Da Silva, P. A., Dias, R. M. T. S., & Zebende, G. F. (2022). Efficiency and Long-Range Correlation in G-20 Stock Indexes: A Sliding Windows Approach. *Fluctuation and Noise Letters*. <https://doi.org/10.1142/S021947752250033X>
- Jarque, C. M., & Bera, A. K. (1980). Efficient tests for normality, homoscedasticity and serial independence of regression residuals. *Economics Letters*, 6(3). [https://doi.org/10.1016/0165-1765\(80\)90024-5](https://doi.org/10.1016/0165-1765(80)90024-5)
- Papageorgiou, C., Saam, M., & Schulte, P. (2017). Substitution between clean and dirty energy inputs: A macroeconomic perspective. *Review of Economics and Statistics*, 99(2). [https://doi.org/10.1162/REST\\_a\\_00592](https://doi.org/10.1162/REST_a_00592)
- Pardal, P., Dias, R., Teixeira, N., & Horta, N. (2022). The Effects of Russia's 2022 Invasion of Ukraine on Global Markets : An Analysis of Particular Capital and Foreign Exchange Markets. <https://doi.org/10.4018/978-1-6684-5666-8.ch014>

- Phillips, P. C. B., & Perron, P. (1988). Testing for a unit root in time series regression. *Biometrika*, 75(2), 335–346. <https://doi.org/10.1093/biomet/75.2.335>
- Ren, B., & Lucey, B. (2022). A clean, green haven?—Examining the relationship between clean energy, clean and dirty cryptocurrencies. *Energy Economics*, 109. <https://doi.org/10.1016/j.eneco.2022.105951>
- Ren, B., & Lucey, B. M. (2021). A Clean, Green Haven?- Examining the Relationship between Clean Energy, Clean and Dirty Cryptocurrencies. *SSRN Electronic Journal*. <https://doi.org/10.2139/ssrn.3963957>
- Santana, T., Horta, N., Revez, C., Santos Dias, R. M. T., & Zebende, G. F. (2023). Effects of interdependence and contagion between Oil and metals by  $\rho$  DCCA : a case of study about the COVID-19. 1–11.
- Santos, H., Dias, R., Vasco, C., Alexandre, P., & Heliodoro, P. (2021). Has the Global Pandemic of 2020 Led To Persistence in the Share Prices of Large Global Companies? 5th EMAN Selected Papers (Part of EMAN Conference Collection), October, 1–15. <https://doi.org/10.31410/eman.s.p.2021.1>
- Shahzad, S. J. H., Bouri, E., Kayani, G. M., Nasir, R. M., & Kristoufek, L. (2020). Are clean energy stocks efficient? Asymmetric multifractal scaling behaviour. *Physica A: Statistical Mechanics and Its Applications*, 550. <https://doi.org/10.1016/j.physa.2020.124519>
- Shen, S. M., & Wang, H. Y. (2023). Asymmetric Multifractal Analysis of the Chinese Energy Futures and Energy Stock Markets under the Impact of COVID-19. *Fluctuation and Noise Letters*, 22(1). <https://doi.org/10.1142/S0219477523500025>
- Teixeira, N., Dias, R. T., Pardal, P., & Horta, N. R. (2022). Financial Integration and Comovements Between Capital Markets and Oil Markets: An Approach During the Russian Invasion of Ukraine in 2022. *Advances in Human Resources Management and Organizational Development*, 240-261. <https://doi.org/10.4018/978-1-6684-5666-8.ch013>
- Uddin, G. S., Rahman, M. L., Hedström, A., & Ahmed, A. (2019). Cross-quantilogram-based correlation and dependence between renewable energy stock and other asset classes. *Energy Economics*, 80, 743–759. <https://doi.org/10.1016/J.ENERCO.2019.02.014>
- Yang, L., Zhu, Y., & Wang, Y. (2016). Multifractal characterization of energy stocks in China: A multifractal detrended fluctuation analysis. *Physica A: Statistical Mechanics and Its Applications*, 451. <https://doi.org/10.1016/j.physa.2016.01.100>
- Yao, C. Z., Mo, Y. N., & Zhang, Z. K. (2021). A study of the efficiency of the Chinese clean energy stock market and its correlation with the crude oil market based on an asymmetric multifractal scaling behavior analysis. *North American Journal of Economics and Finance*, 58. <https://doi.org/10.1016/j.najef.2021.101520>
- Zebende, G. F., Santos Dias, R. M. T., & de Aguiar, L. C. (2022). Stock market efficiency: An intraday case of study about the G-20 group. In *Heliyon* (Vol. 8, Issue 1). <https://doi.org/10.1016/j.heliyon.2022.e08808>





# Will There Be Dependencies between Oil Prices and Clean Energy Indexes?

Mariana Chambino<sup>1</sup> 

Rui Dias<sup>2</sup> 

Cristina Morais da Palma<sup>3</sup> 

Received: August 31, 2023

Accepted: October 31, 2023

Published: March 16, 2024

## Keywords:

Clean energy stocks;  
Oil prices;  
Hedge;  
Portfolio diversification



Creative Commons Non Commercial CC BY-NC: This article is distributed under the terms of the Creative Commons Attribution-Non-Commercial 4.0 License (<https://creativecommons.org/licenses/by-nc/4.0/>) which permits non-commercial use, reproduction and distribution of the work without further permission.

**Abstract:** *This paper analyses whether clean energy stock indexes, namely WilderHill Clean Energy, Clean Energy Fuels, and Nasdaq Clean Edge Green Energy indexes, can be considered coverage assets for the dirty energy stock indexes such as the Brent Crude Spot and Euro Stoxx Oil & Gas indexes during the events that occurred in 2020 and 2022. The results suggest low levels of integration, which shows that clean energy indexes are isolated. Based on these findings, the clean energy index may offer a better opportunity to cover oil prices. However, it is important to highlight that market conditions, transaction costs, and asset performance affect hedge strategy returns. Therefore, it is important to carefully assess the potential risks and benefits of any hedge strategy before making investment decisions. In addition, past performance does not guarantee future results, and market conditions can change quickly and unpredictably.*

## 1. INTRODUCTION

In recent years, the relationship between crude oil prices and renewable energy stock values has gotten more complex and dynamic. In the past, rising oil costs have increased demand for cleaner energy sources. However, this link evolved as a result of many factors. Concerns about climate change, technical advancements, and government assistance are all driving rising demand for sustainable energy. Global oil price variations, on the other hand, have become less predictable owing to geopolitical tensions, supply interruptions, and changes in demand patterns. Because of this shifting picture, the interplay between crude oil prices and clean energy stock prices has become increasingly complex (Dias et al., 2023).

In the field of the stock market, portfolio rebalancing is the process of adjusting the asset allocation in a portfolio to align it with the investor's investment objectives and risk tolerance. This approach is especially crucial during times of global economic instability since it assists investors in managing risk and maintaining the desired amount of portfolio diversification. Re-balancing can involve selling assets that have appreciated in value and reallocating revenue to underperforming assets in order to align the portfolio with its desired allocation. This reduces the risk of the portfolio becoming overly concentrated in a single asset class, sector, or geographical region (Dias et al., 2019, 2020, 2021; Silva et al., 2020; Dias & Carvalho, 2021; Pardal et al., 2021).

The present study aims to analyze whether clean energy stock indexes, specifically the WilderHill Clean Energy (ECO), Clean Energy Fuels (CLNE), and Nasdaq Clean Edge Green Energy (CELS) indexes, can be considered coverage assets for dirty energy stock indexes such as the Brent Crude Spot (BRENT) and Euro Stoxx Oil & Gas (EUSTOXX) indexes during the 2020

<sup>1</sup> Polytechnic Institute of Setúbal, Escola Superior de Ciências Empresariais, 2910-761 Setúbal, Portugal

<sup>2</sup> Polytechnic Institute of Setúbal, Escola Superior de Ciências Empresariais, 2910-761 Setúbal, Portugal; Center of Advanced Studies in Management and Economics, University of Évora, 7004-516 Évora, Portugal

<sup>3</sup> Polytechnic Institute of Setúbal, Escola Superior de Ciências Empresariais, 2910-761 Setúbal, Portugal

and 2022 events. The results suggest low levels of integration, indicating that clean energy indexes operate in isolation. Based on these results, it can be inferred that the clean energy index may offer a more promising opportunity for covering oil prices.

Previous research argues that the linkages between clean/green and filthy energy assets change over time, but there is not much evidence on the capacity for clean energy shares to cover dirty assets such as crude oil and the portfolio implications. Furthermore, the determinants of the fluctuations in the returns of hedge portfolios remain uncertain. An important question that has received a lot of attention in recent years is whether clean energy stock indexes can be regarded as hedge assets in dirty energy stock indexes.

The main purpose of this study is to offer valuable insights into the relationship between clean energy and dirty energy stock indexes and their potential as hedge assets. Clean energy stock indexes such as the ECO, CLNE, and CELS indexes might potentially protect dirty energy stock indexes such as the BRENT and EUSTOXX indexes. The COVID-19 pandemic issue, for example, showed the potential risks of investing in dirty energy stocks while proving resilience through clean energy actions. Overall, this research examines the potential use of clean energy stock indexes, as covering assets for dirty energy stock indexes has significant implications for investors and policymakers attempting to mitigate the risks associated with investing in energy stocks.

This paper is structured into 5 distinct sections, with each section serving a specific purpose. Section 2 provides a comprehensive analysis of the existing literature on the integration of international financial markets. Section 3 provides an account of the methodology and the data used in the study. The findings are presented in Section 4. Lastly, Section 5 of the document outlines the conclusions.

## 2. LITERATURE REVIEW

International financial market linkages are crucial for investors, fund managers, and academics. Understanding the interrelationships between financial markets across the globe during times of stress can help investors recognize the synchronizations between markets and enable them to make knowledgeable decisions regarding portfolio diversification. For academics, examining these connections can provide effective insights into how the global financial system operates. It may also provide opportunities for research in fields such as international finance, macroeconomics, and econometrics. Understanding the global linkages among financial markets holds significant relevance for all players involved in the financial system. By recognizing the interconnections of different markets, investors are able to engage in risk management practices that improve the optimization of their investment portfolios. Furthermore, academic research may be useful as an explanation for the complex dynamics of the global financial system and to inform policymakers on financial stability and regulation issues (Dias, Pardal, et al., 2022; Dias, Pereira, et al., 2022; Pardal, Dias, Teixeira & Horta, 2022; Teixeira, Dias & Pardal, 2022; Teixeira, Dias, Pardal & Horta, 2022).

The authors Kumar et al. (2012), Managi and Okimoto (2013), and Saeed et al. (2020) explored whether clean energies could provide a safe haven for dirty energies. According to Kumar et al. (2012), increasing traditional energy prices and/or applying a price on carbon emissions would encourage investments in clean energy companies. The authors highlight that oil prices and technology stock prices separately affect the share prices of clean energy companies, showing

that coverage and safe haven effects could be challenged. Similarly, [Managi and Okimoto \(2013\)](#) analyzed the relationships between oil prices, clean energy stock prices, and technology stock prices. The results show that there was a structural change at the end of 2007, a period in which there was a significant rise in oil prices. The author's findings diverge from prior research as they reveal a positive relation between oil prices and clean energy prices after structural market recessions. This result challenges the concept of coverage effect in the context of portfolio diversification. Furthermore, [Saeed et al. \(2020\)](#) used daily data from January 3, 2012, to November 29, 2019, to analyze the covering capacity of clean and green assets in relation to 2 dirty energy assets (oil prices and energy ETFs). The authors suggest that investors should use a dynamic hedging strategy and that clean energy stocks are a more effective hedge than green bonds, in particular for crude oil.

Later, the authors [Ren and Lucey \(2022\)](#) and [Arfaoui et al. \(2023\)](#), show the negative environmental effects of cryptocurrencies' high-power energy consumption and link these assets to assess if clean energies will have the attributes required to be coverage assets or act as a safe haven. [Ren and Lucey \(2022\)](#) evaluated the hedges and safe haven ownership of a wide range of clean energy indexes against two separate types of cryptocurrencies named "dirty" and "clean" based on their energy consumption levels. The results indicate that clean energy does not provide immediate protection of any type. However, it acts as a poor safe haven for both markets. Furthermore, it is apparent that during times of increased uncertainty, the clean energy market may act as a safe haven for cryptocurrencies with high energy consumption rather than for clean ones. [Arfaoui et al. \(2023\)](#) examined the dependence between clean energy, green markets, and cryptocurrencies during the period from January 2018 to November 2021. The results show that sustainable investments, such as DJSI and ESGI, played an important role in the network system during the COVID-19 pandemic, and green bonds were the least integrated with other financial markets, implying their importance in delivering diversification advantages to investors.

In recent studies, the authors [Sharif et al. \(2023\)](#) and [Farid et al. \(2023\)](#) studied the coverage and safe haven characteristics of clean energy stock indexes in relation to various asset classes. The study conducted by [Sharif et al. \(2023\)](#) aimed to investigate the correlations and relationships between green economic indexes, 5 dirty cryptocurrencies, and 5 clean cryptocurrencies in the markets of the US, EU, and Asia. The research period spanned from November 9, 2017, to April 4, 2022. The empirical findings reveal that the overall correlation between green economic indexes and clean cryptocurrencies is stronger than the linkage between dirty crypto and green economic indexes. Furthermore, 2020 is a historical year for clean cryptocurrency since it signals the beginning of the COVID-19 pandemic. The total overload effect is very strong for all 3 markets, particularly in Asia, thereby raising concerns regarding the efficacy of coverage and safe haven strategies. Additionally, [Farid et al. \(2023\)](#) investigated co-movements between clean and dirty energy stock indexes before and during the 2020 global pandemic. The results reveal weak linkages between clean energy stocks and dirty energy stocks in both the short and long term, with an evident disassociation effect between dirty and clean energy stock markets. Also, the findings illustrate that the clean energy market was relatively detached from the dirty energy market during the recent pandemic crisis, emphasizing the benefits of portfolio diversification in both the clean and dirty energy markets.

### 3. METHODOLOGY AND DATA

#### 3.1. Data

The data used in the paper is daily, and the sample includes 3 clean energy stock indexes: WilderHill Clean Energy (ECO), Clean Energy Fuels (CLNE), and Nasdaq Clean Edge Green Energy (CELS), as well as 2 dirty energy stock indexes: Brent Crude Spot (BRENT) and Euro Stoxx Oil & Gas (EUSTOXX). The period under study is the period from March 1, 2018, to March 1, 2023, and includes events with significant complexity for the global economy, such as the global pandemic COVID-19, followed by the oil price war between Russia and Saudi Arabia, and the Russian invasion of Ukraine in 2022. The data has been obtained through the Thomson Reuters Eikon platform and is expressed in US dollars.

#### 3.2. Methodology

The paper is developed in phases. In the first phase, the main measures of descriptive statistics and the [Jarque and Bera \(1980\)](#) adherence test, which postulate data normality, are used to characterize the sample. The panel unit root tests from [Hadri \(2000\)](#) are used to validate the assumption of stationarity of the time series, and the tests of [Dickey and Fuller \(1981\)](#), incorporating Fisher's Chi-square and [Choi's \(2001\)](#) transformation, are used to validate the results. The panel tests ADF (Augmented Dickey-Fuller), Fisher Chi-square, and ADF-Choi Z-stat are econometric statistical tests commonly used to determine the presence of a unit root in a time series data set. Fisher's qui-square ADF test calculates a test statistic based on the difference between the estimated and hypothetical values of a regression model coefficient. This test statistic follows a qui-square distribution, and its level of significance is used to determine the presence of a unit root.

The Choi Z-stat version of the ADF test, on the other hand, is an alternate approach that calculates test statistics based on the autoregressive model estimate of maximum likelihood. This test statistic follows a standard normal distribution, and its level of significance is used to evaluate the research question, i.e., whether clean energy stock indexes may be considered coverage assets for dirty energy stock indexes during the events of 2020 and 2022. The rhoDCCA of [Zebende \(2011\)](#) is estimated, which allows it to determine the level of cross-correlation between different energy indexes. This coefficient is based on [Peng et al. \(1994\)](#) Detrended Fluctuation Analysis (DFA) methods and [Podobnik and Stanley \(2008\)](#) Detrended Cross-correlation Analysis (DCCA).

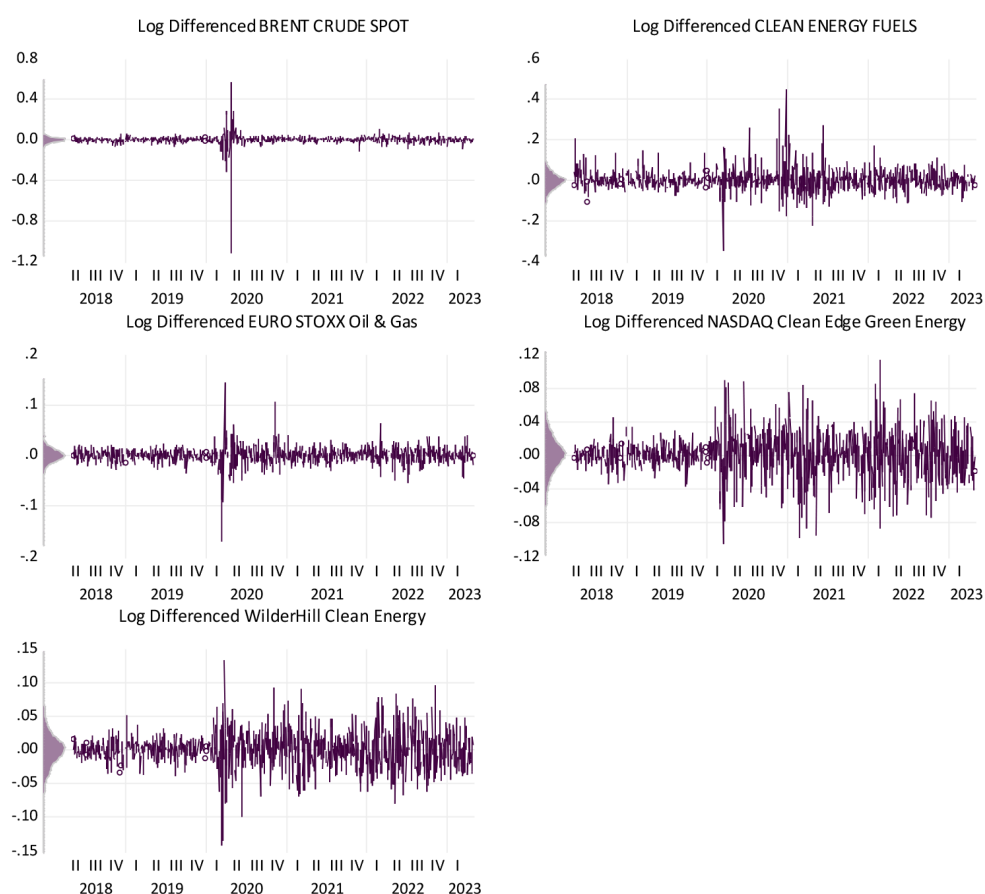
The cross-correlation coefficient depends on the length of the  $s$  box (temporal scale). The main advantage associated with this cross-correlation coefficient is the ability to measure the correlations between two non-stationarity time series on different time scales. The DCCA coefficient varies within the range  $-1 \leq \rho_{DCCA} \leq 1$ . In this sense, 1 means that the series shows perfect cross-correlation between the two signs, -1 means perfect anti-cross-correlation, and 0 means no correlation between the time series. For a better understanding of this econophysical model, see the articles published by the authors [Zebende et al. \(2022\)](#), [Guedes et al. \(2022\)](#), and [Santana et al. \(2023\)](#).

### 4. RESULTS

The visual representation shown in Figure 1 demonstrates the evolution of the 5 energy stock indexes analyzed in this study. These indexes include 3 clean energy stock indexes, namely WilderHill Clean Energy (ECO), Clean Energy Fuels (CLNE), and Nasdaq Clean Edge Green

Energy (CELS), as well as 2 dirty energy stock indexes, namely Brent Crude Spot (BRENT) and Euro Stoxx Oil Gas (EUSTOXX). The time frame for this analysis spans from February 28, 2018, to March 1, 2023.

The initial wave of the global COVID-19 pandemic, as well as the oil price war between OPEP members, are known to have taken place in the early months of 2020 and, consequently, had a significant influence on the energy stock indexes under study. The behavior of the clean energy stock indexes, particularly ECO, CLNE, and CELS, has changed. With Russia's invasion of Ukraine in 2022, the supply of natural gas was reduced, and its price increased abruptly. Regarding the future scarcity of energy resources, global economies are increasingly interested in diversifying their investments through clean energy alternatives. The authors [Dias, Horta, and Chambino \(2023\)](#) suggested the existence of such evidence in their study of the behavior and efficiency of the international financial markets.



**Figure 1.** Evolution, in levels, of the financial markets under analysis, from March 1, 2018, to March 1, 2023

**Source:** Own elaboration

Table 1 shows the main descriptive statistical measures for the 5 energy stock indexes under consideration, as well as the results of the [Jarque and Bera \(1980\)](#) adherence test for the whole period. In terms of mean returns, all stock indexes presented positive values. Regarding standard deviation, the CLNE stock index (0.040084) has the most significant degree of dispersion. To determine if the energy stock indexes follow a Gaussian distribution, the metrics of skewness and kurtosis were estimated. The findings indicate that the indexes exhibit distinct values of 0 and 3 for asymmetry and kurtosis, respectively. Furthermore, to corroborate the previous

evidence, i.e., whether the time series returns present values corresponding to a normal distribution or not, the **Jarque and Bera (1980)** adherence test was performed and the results indicate that  $H_0$  is rejected at a level of significance of 1%. In other words, the time series returns on the energy stock indexes under research fail to follow a normal distribution.

**Table 1.** Summary table of descriptive statistics, in returns, in respect of the financial markets under analysis, from March 1, 2018, to March 1, 2023

	<b>BRENT</b>	<b>CLNE</b>	<b>EUSTOXX</b>	<b>CELS</b>	<b>ECO</b>
Mean	0.000431	0.000482	0.000104	0.000571	0.000125
Std. Dev.	0.038992	0.040084	0.012673	0.018702	0.019707
Skewness	-11.31994	1.459962	-0.602354	-0.138421	-0.094281
Kurtosis	418.9986	24.10483	37.57033	9.279764	10.20693
Jarque-Bera	13205589	34537.25	91038.18	3006.210	3954.463
Probability	0.000000	0.000000	0.000000	0.000000	0.000000
Observations	1826	1826	1826	1826	1826

**Source:** Own elaboration

The panel unit root test of **Hadri (2000)**, which has stationarity as a null hypothesis, was used to test the assumption that the time series of the clean and dirty energy stock indexes were stationary. According to the results in Table 2, the null hypothesis is not rejected at a level of significance of 1%, implying that the time series on the panel are constant in the first differences.

**Table 2.** Unit root panel test, in respect of the financial markets under analysis, from March 1, 2018, to March 1, 2023

<b>Null Hypothesis: Stationarity</b>				
Method		Statistic	Prob.*	
Hadri Z-stat		-2.91247	0.9982	
Heteroscedastic Consistent Z-stat		-2.76113	0.9971	
Series	LM	Variance HAC	Bandwidth	Obs.
BRENT	0.0118	64.78658	50.0	1825
CLNE	0.0243	0.242504	49.0	1825
EUSTOXX	0.0109	1038.036	50.0	1825
CELS	0.0123	5445.474	50.0	1825
ECO	0.0160	219.1902	50.0	1825

**Notes:** High autocorrelation leads to severe size distortion in Hadri's test, leading to over-rejection of the null. \* Probabilities are computed assuming asymptotic normality.

**Source:** Own elaboration

Additionally, the tests by **Dickey and Fuller (1981)** with the Fisher Chi-square transformation and **Choi (2001)** that postulate the same null hypothesis, i.e., the presence of a unit root or non-constant variance, were used to validate the preceding results. According to the findings presented in Table 3, the null hypothesis is rejected at a level of significance of 1%, corroborating previous evidence regarding the stationarity of the time series at the period under analysis. It should be highlighted that stationarity can only be achieved using the logarithmic transformation in first differences, which is used to calculate the return of each stock index.

In Table 4, the Detrend Cross-Correlation Coefficient (*rhoDCCA*) for the clean and dirty energy stock indexes can be observed for the period from March 1, 2018, to March 1, 2023. To increase the robustness of the findings, the sample was partitioned into two distinct subperiods.

The first subperiod, denoted as Tranquil, corresponds to a period of apparent stability in financial markets. The second subperiod, referred to as Stress, covers the events that occurred in 2020 and 2022.

**Table 3.** Unit root panel tests, in respect of the financial markets under analysis, from March 1, 2018, to March 1, 2023

Null Hypothesis: Unit root (individual unit root process)				
Method			Statistic	Prob.*
ADF – Fisher Chi-square			1018.04	0.0000
ADF – Choi Z-stat			-31.1896	0.0000
Series	Prob.	Lag	Max Lag	Obs.
BRENT	0.0000	19	24	1805
CLNE	0.0000	20	24	1804
EUSTOXX	0.0000	19	24	1805
CELS	0.0000	19	24	1805
ECO	0.0000	19	24	1805

**Note:** \* Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

**Source:** Own elaboration

**Table 4.** Summary of the *rhoDCCA* coefficients, applied to the 5 stock indexes, referring to the Tranquil and Stress subperiods

Indexes	Tranquil Sub-Period			Stress Sub-Period		
	<i>rhoDCCA</i>	Period (days)	Trend	<i>rhoDCCA</i>	Period (days)	Trend
BRENT / CELS	0.22	n > 6	weak	0.15	n > 6	weak
BRENT / ECO	0.19	n > 6	weak	0.17	n > 6	weak
BRENT / EUSTOXX	0.38	n > 52	medium	0.39	n > 6	medium
BRENT / CLNE	0.23	n > 20	weak	0.13	n > 6	weak
CELS / ECO	0.67	n > 43	strong	0.04	n > 6	weak
CELS / EUSTOXX	0.38	n > 20	medium	0.30	n > 6	weak
CELS / CLNE	0.34	n > 16	medium	0.68	n > 165	strong
ECO / EUSTOXX	0.37	n > 52	medium	0.24	n > 16	weak
ECO / CLNE	0.22	n > 16	weak	0.47	n > 43	medium
EUSTOXX / CLNE	0.34	n > 112	medium	0.37	n > 52	medium

**Note:** Data collected by the author.

**Source:** Own elaboration

The *rhoDCCA* coefficients for the Tranquil period reveal 5 medium correlation coefficients  $\cong 0.333 \rightarrow \cong 0.666$ , 4 weak correlations coefficients  $\cong 0.000 \rightarrow \cong 0.333$ , and 1 strong cross-correlation without trend  $\cong 0.666 \rightarrow \cong 1.000$ . In the Stress subperiod, which includes the period from January 1, 2020, to March 1, 2023, there are 6 weak correlation coefficients  $\cong 0.000 \rightarrow \cong 0.333$ , 3 medium correlation coefficients  $\cong 0.333 \rightarrow \cong 0.666$ , and 1 strong cross-correlation without trend  $\cong 0.666 \rightarrow \cong 1.000$ .

When comparing the two subperiods, it is visible that the majority of *rhoDCCA* go through a transition from medium to weak non-trend correlation coefficients. The findings show that in 2020 and 2022, most of the stock markets studied were not integrated. This confirms that clean energy stock indexes may serve as hedge assets in relation to dirty energy stock indexes. Consequently, for investors involved in these energy markets, clean energy assets may present a viable risk diversification strategy.

## 5. CONCLUSION

This research aimed to assess the potential of clean energy stock indexes, specifically the Wilder-Hill Clean Energy (ECO), Clean Energy Fuels (CLNE), and Nasdaq Clean Edge Green Energy (CELS) indexes, as hedge assets against dirty energy stock indexes such as the Brent Crude Spot (BRENT) and Euro Stoxx Oil & Gas (EUSTOXX) indexes, during the periods of 2020 and 2022. The findings indicate a limited degree of integration among these measures. This suggests that the clean energy indexes exhibit relative isolation from the dirty energy indexes. Based on these facts, it can be deduced that clean energy indexes might provide a more favorable prospect for hedging against fluctuations in oil prices. This further suggests that allocating investments towards renewable energy stocks might function as a hedging strategy against the volatility of oil prices since they seem to be less susceptible to external factors impacting the fossil fuel industry. Nevertheless, it is crucial to acknowledge that these results are limited in their applicability to the particular study conducted and the period under examination. Additional examination and the inclusion of additional variables may be required in order to substantiate and extrapolate these results.

## References

- Arfaoui, N., Naeem, M. A., Boubaker, S., Mirza, N., & Karim, S. (2023). Interdependence of clean energy and green markets with cryptocurrencies. *Energy Economics*, 120. <https://doi.org/10.1016/j.eneco.2023.106584>
- Choi, I. (2001). Unit root tests for panel data. *Journal of International Money and Finance*, 20(2), 249–272. [https://doi.org/10.1016/S0261-5606\(00\)00048-6](https://doi.org/10.1016/S0261-5606(00)00048-6)
- Dias, R., da Silva, J. V., & Dionísio, A. (2019). Financial markets of the LAC region: Does the crisis influence the financial integration? *International Review of Financial Analysis*, 63, 160–173. <https://doi.org/10.1016/j.irfa.2019.02.008>
- Dias, R., Horta, N., & Chambino, M. (2023). Clean Energy Action Index Efficiency: An Analysis in Global Uncertainty Contexts. *Energies*, 16(9). <https://doi.org/10.3390/en16093937>
- Dias, R., Pardal, P., Teixeira, N., & Machová, V. (2020). Financial Market Integration of ASEAN-5 with China. *Littera Scripta*, 13(1). [https://doi.org/10.36708/littera\\_scripta2020/1/4](https://doi.org/10.36708/littera_scripta2020/1/4)
- Dias, R., Pereira, J. M., & Carvalho, L. C. (2022). Are African Stock Markets Efficient? A Comparative Analysis Between Six African Markets, the UK, Japan and the USA in the Period of the Pandemic. *Naše gospodarstvo/Our economy*, 68(1), 35–51. <https://doi.org/10.2478/ngoe-2022-0004>
- Dias, R., Santos, H., Heliodoro, P., Vasco, C., & Alexandre, P. (2021). Wti Oil Shocks in Eastern European Stock Markets: A Var Approach. *5th EMAN Conference Proceedings (Part of EMAN Conference Collection)*, October, 71–84. <https://doi.org/10.31410/eman.2021.71>
- Dias, R. T., & Carvalho, L. (2021). *The Relationship Between Gold and Stock Markets During the COVID-19 Pandemic*. May, 462–475. <https://doi.org/10.4018/978-1-7998-6643-5.ch026>
- Dias, R. T., Pardal, P., Teixeira, N., & Horta, N. R. (2022). Tail Risk and Return Predictability for Europe's Capital Markets: An Approach in Periods of the 2020 and 2022 Crises. *Advances in Human Resources Management and Organizational Development*, 281–298. <https://doi.org/10.4018/978-1-6684-5666-8.ch015>
- Dickey, D., & Fuller, W. (1981). Likelihood ratio statistics for autoregressive time series with a unit root. *Econometrica*, 49(4), 1057–1072. <https://doi.org/10.2307/1912517>
- Farid, S., Karim, S., Naeem, M. A., Nepal, R., & Jamasb, T. (2023). Co-movement between dirty and clean energy: A time-frequency perspective. *Energy Economics*, 119. <https://doi.org/10.1016/j.eneco.2023.106565>
- Guedes, E. F., Santos, R. P. C., Figueredo, L. H. R., Da Silva, P. A., Dias, R. M. T. S., & Zebende, G. F. (2022). Efficiency and Long-Range Correlation in G-20 Stock Indexes: A Sliding Windows Approach. *Fluctuation and Noise Letters*. <https://doi.org/10.1142/S021947752250033X>



- Hadri, K. (2000). Testing for stationarity in heterogeneous panel data. *The Econometrics Journal*. <https://doi.org/10.1111/1368-423x.00043>
- Jarque, C. M., & Bera, A. K. (1980). Efficient tests for normality, homoscedasticity and serial independence of regression residuals. *Economics Letters*, 6(3), 255–259. [https://doi.org/10.1016/0165-1765\(80\)90024-5](https://doi.org/10.1016/0165-1765(80)90024-5)
- Kumar, S., Managi, S., & Matsuda, A. (2012). Stock prices of clean energy firms, oil and carbon markets: A vector autoregressive analysis. *Energy Economics*, 34(1). <https://doi.org/10.1016/j.eneco.2011.03.002>
- Managi, S., & Okimoto, T. (2013). Does the price of oil interact with clean energy prices in the stock market? *Japan and the World Economy*, 27. <https://doi.org/10.1016/j.japwor.2013.03.003>
- Pardal, P., Dias, R., Teixeira, N., & Horta, N. (2022). *The Effects of Russia's 2022 Invasion of Ukraine on Global Markets : An Analysis of Particular Capital and Foreign Exchange Markets*. <https://doi.org/10.4018/978-1-6684-5666-8.ch014>
- Pardal, P., Dias, R. T., Santos, H., & Vasco, C. (2021). Central European banking sector integration and shocks during the global pandemic (COVID-19). In *Handbook of Research on Reinventing Economies and Organizations Following a Global Health Crisis*. <https://doi.org/10.4018/978-1-7998-6926-9.ch015>
- Peng, C. K., Buldyrev, S. V., Havlin, S., Simons, M., Stanley, H. E., & Goldberger, A. L. (1994). Mosaic organization of DNA nucleotides. *Physical Review E*, 49(2), 1685–1689. <https://doi.org/10.1103/PhysRevE.49.1685>
- Podobnik, B., & Stanley, H. E. (2008). Detrended cross-correlation analysis: A new method for analyzing two nonstationary time series. *Physical Review Letters*, 100(8). <https://doi.org/10.1103/PhysRevLett.100.084102>
- Ren, B., & Lucey, B. (2022). A clean, green haven? - Examining the relationship between clean energy, clean and dirty cryptocurrencies. *Energy Economics*, 109. <https://doi.org/10.1016/j.eneco.2022.105951>
- Saeed, T., Bouri, E., & Vo, X. V. (2020). Hedging strategies of green assets against dirty energy assets. *Energies*, 13(12). <https://doi.org/10.3390/en13123141>
- Santana, T., Horta, N., Revez, C., Santos Dias, R. M. T., & Zebende, G. F. (2023). *Effects of Interdependence and Contagion on Crude Oil and Precious Metals According to pDCCA: A COVID-19 Case Study*. 1–11.
- Sharif, A., Brahim, M., Dogan, E., & Tzeremes, P. (2023). Analysis of the spillover effects between green economy, clean and dirty cryptocurrencies. *Energy Economics*, 120. <https://doi.org/10.1016/j.eneco.2023.106594>
- Silva, R., Dias, R., Heliodoro, P., & Alexandre, P. (2020). Risk Diversification in Asean-5 Financial Markets: an Empirical Analysis in the Context of the Global Pandemic (COVID-19). *6th LIMEN Selected Papers (Part of LIMEN Conference Collection)*, 6, 15–26. <https://doi.org/10.31410/limen.s.p.2020.15>
- Teixeira, N., Dias, R., & Pardal, P. (2022). *The gold market as a safe haven when stock markets exhibit pronounced levels of risk : evidence during the China crisis and the COVID-19 pandemic*. April, 27–42.
- Teixeira, N., Dias, R., Pardal, P., & Horta, N. (2022). *Financial Integration and Comovements Between Capital Markets and Oil Markets : An Approach During the Russian*. December. <https://doi.org/10.4018/978-1-6684-5666-8.ch013>
- Zebende, G. F. (2011). DCCA cross-correlation coefficient: Quantifying level of cross-correlation. *Physica A: Statistical Mechanics and Its Applications*. <https://doi.org/10.1016/j.physa.2010.10.022>
- Zebende, G. F., Santos Dias, R. M. T., & de Aguiar, L. C. (2022). Stock market efficiency: An intraday case of study about the G-20 group. *Heliyon*, 8(1), e08808. <https://doi.org/10.1016/j.heliyon.2022.e08808>





# Cryptocurrency Market: Overreaction to News and Herd Instincts

Rui Dias<sup>1</sup>

Mariana Chambino<sup>2</sup>

Cristina Morais da Palma<sup>3</sup>

Received: August 31, 2023

Accepted: February 13, 2024

Published: March 16, 2024

## Keywords:

Cryptocurrency;  
Overreaction;  
Mean reversion



Creative Commons Non Commercial CC BY-NC: This article is distributed under the terms of the Creative Commons Attribution-Non-Commercial 4.0 License (<https://creativecommons.org/licenses/by-nc/4.0/>) which permits non-commercial use, reproduction and distribution of the work without further permission.

**Abstract:** *The present research focuses on the phenomenon of cryptocurrency market overreactions, especially examining the behavior of Bitcoin, DASH, EOS, Ethereum, Lisk, Litecoin, Monero, NEO, Quantum, Ripple, Stellar, and Zcash from January 2, 2018, to March 1, 2023. The findings show that there are both positive and negative autocorrelations, which might result in lowered volatility and more moderate fluctuations in prices. These results possess the potential to assist investors in making well-informed choices since they are less susceptible to being influenced by exaggerated reactions to news or information hitting the market. However, before investing in cryptocurrency markets, investors should exercise caution and carefully examine their risk tolerance, since market circumstances may change quickly, making it impossible to perform consistently profitable trades.*

## 1. INTRODUCTION

The efficient market hypothesis posits that stock prices include all relevant information, thereby making the prediction of future returns and the attainment of abnormal gains challenging for investors. Nevertheless, several academic investigations conducted since the mid-1980s have presented arguments against this assumption. Bondt and Thaler (1985) conducted a study that demonstrated the potential for achieving abnormal returns over the long term through the investment in stocks with a history of poor performance (extreme initial losers) and the divestment of those that have exhibited strong performance (extreme initial winners). The authors suggest that adopting a “contrary” investing strategy yields positive returns since investors tend to exhibit exaggerated reactions to information, resulting in an excessive level of both optimism and pessimism within the market.

According to author Urquhart (2018), the volatility of cryptocurrency prices is an example of exaggerated reactions that lasted for six months and drew the attention of investors, regulators, and policymakers, among others. According to the authors, Amini et al. (2013), exaggerated reactions may occur in shorter periods of a few minutes on different asset classes, leading to a repeated pattern of high prices followed by decreases (or vice versa) in financial markets. Therefore, it is essential to do thorough research aimed at examining the occurrence of exaggerated price reactions in cryptocurrencies.

Traditional research has focused on stock markets, but the purpose of this study is to investigate the behavior of digital currencies, which have emerged as a new asset class that has attracted the interest of investors and gained recognition in financial circles in recent years. In this study, we have conducted an analysis and presented empirical evidence about the prevalence

<sup>1</sup> Polytechnic Institute of Setúbal, Escola Superior de Ciências Empresariais, 2910-761 Setúbal, Portugal;  
Center of Advanced Studies in Management and Economics, University of Évora, 7004-516 Évora, Portugal  
<sup>2</sup> Polytechnic Institute of Setúbal, Escola Superior de Ciências Empresariais, 2910-761 Setúbal, Portugal  
<sup>3</sup> Polytechnic Institute of Setúbal, Escola Superior de Ciências Empresariais, 2910-761 Setúbal, Portugal

of exaggerated reactions throughout digital currency markets, including Bitcoin (BTC), DASH, EOS, Ethereum (ETH), Lisk (LSK), Litecoin (LTC), Monero (XMR), NEO, Quantum (QUA), Ripple (XRP), Stellar, and ZCASH.

This manuscript presents a significant contribution to the existing literature concerning overreaction behavior in digital currency markets. It introduces a novel modeling method that eliminates the need for explicit limit parameters. In our investigation, we used a modeling approach to represent the exaggerated price reactions by considering price changes with a time lag ranging from 16 days. This method differs from other studies that have relied on statistical modeling of exaggerated reactions, which requires the arbitrary selection of one or more parameters. Given the significance of selecting these parameters, the resultant findings may exhibit a certain tendency. Therefore, our research expands upon the existing empirical literature by using a rigorous and unbiased methodology to evaluate the prevalence of exaggerated reaction patterns across different digital currencies.

The article is organized into five sections. Section 2 provides a review of the literature on the overreactions of investors in global markets. Section 3 describes the methodology and data of the study. Section 4 presents the results of the analysis. Finally, Section 5 summarizes the conclusions.

## 2. LITERATURE REVIEW

Exaggerated reactions in financial markets have been more common in recent decades, as shown by academic studies and Wall Street views. Several writers have investigated the behavior of investors in different financial markets as well as their propensity to overreact. [Bondt and Thaler \(1985\)](#) argue that the typical reversal in stock prices is demonstrated by exaggerated responses; however, [Chen and Zhu \(2005\)](#), who studied the Chinese stock market, argue that investors tend to overreact to positive news and underreact to negative news. [Antweiler and Frank \(2011\)](#) observed evidence of reversal or exaggerated reaction in abnormal, pre-, and post-event corporate news returns, which supports the efficient market hypothesis. Later, [De Bondt and Thaler \(2012\)](#) demonstrate that high returns to first losers are not due to risk, tax effects, or tiny anomalies but rather to unpleasant expectations of future returns. In researching the 1987 stock market crash, author [Shiller \(2022\)](#) shows that investors were motivated by each other's conduct rather than by negative economic news. In more recent research, the authors [Diaconășu et al. \(2022\)](#), [Schaub \(2022\)](#), and [Wen et al. \(2022\)](#) studied whether investors react to each other's behavior or information entering the digital currency market. According to [Diaconășu et al. \(2022\)](#), the Bitcoin market matures with time as investor behavior fits with the uncertain information hypothesis of positive and negative events. Furthermore, the analysis suggests that Bitcoin's efficiency increased throughout the COVID-19 pandemic. According to [Schaub \(2022\)](#), Bitcoin and Ethereum overreact to such situations, but Tether has a significant value reversal following atypically positive events. [Wen et al. \(2022\)](#) provide evidence of intraday return predictability in the digital currency market. Other actively traded digital currencies, such as Ethereum, Litecoin, and Ripple, show evidence of intraday timing. The research also demonstrates that a timing strategy based on intraday predictors outperforms reference techniques in terms of economic value. The late-informed investor theory explains the evidence of intraday timing.

Understanding the cryptocurrency market dynamics requires assessing how investors react to each other's behavior or information received. This is important because of the risk of herd

behavior, asset price bubbles, and crashes caused by irrational investor decisions influenced by others in the market. Furthermore, the digital currency market's extreme volatility and lack of regulation underscore the necessity to investigate the influence of information on investor behavior. This information may be used to make better investment decisions and to help establish more effective regulatory frameworks for the cryptocurrency market.

### 3. METHODOLOGY

#### 3.1. Data

The time series comprises daily data from January 2, 2018, to March 1, 2023, including a sample of 12 digital currencies, namely Bitcoin (BTC), DASH, EOS, Ethereum (ETH), Lisk (LSK), Litecoin (LTC), Monero (XMR), NEO, Quantum (QUA), Ripple (XRP), Stellar, and ZCASH. It is important to note that the period in question includes exogenous events of considerable complexity for the global economy, such as the COVID-19 outbreak, the subsequent oil price conflict among OPEP members, and the Russian invasion of Ukraine in 2022. The data was obtained from Thomson Reuters Eikon and is represented in U.S. dollars.

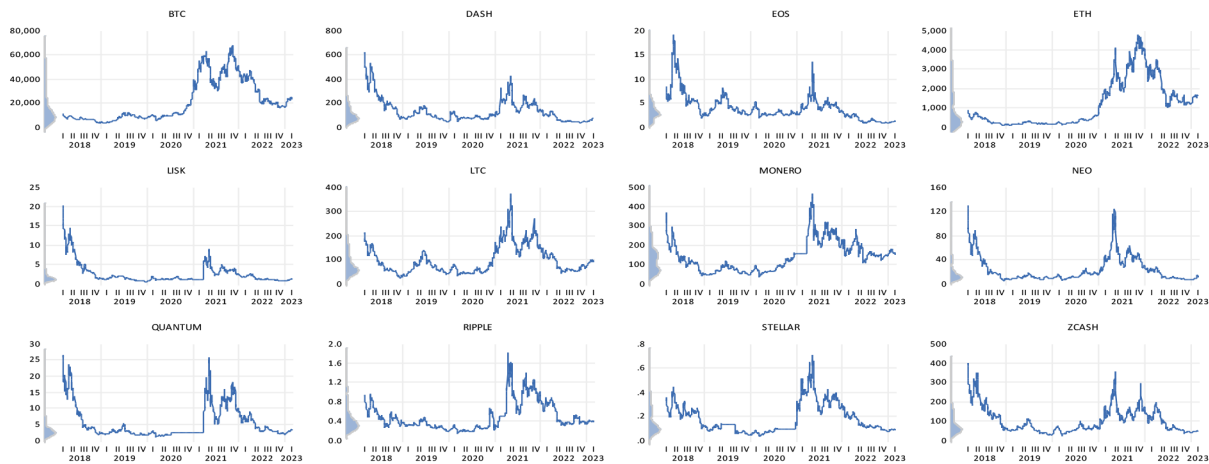
#### 3.2. Methodology

The development of research will occur in multiple phases. The characterization of the sample used in the study was carried out using descriptive statistics as well as the [Jarque and Bera \(1980\)](#) adherence test. In order to assess the stationarity of the time series, we will use the panel unit root tests proposed by [Levin et al. \(2002\)](#) and [Im et al. \(2003\)](#). Additionally, to validate the obtained results, we will apply the [Dickey and Fuller \(1981\)](#) and [Phillips and Perron \(1988\)](#) tests, using the Fisher Chi-square transformation. In order to answer the research question regarding the possible existence of exaggerated reactions in the price series of cryptocurrencies, we will use the non-parametric test proposed by [Wright \(2000\)](#). This test includes the Position Test (Rankings) as well as the Signal Test, which is specifically designed for heteroscedastic series. According to [Vats and Kamaiah \(2011\)](#), these methods provide more accurate estimations when dealing with smaller sample sizes and exhibit more statistical power compared to standard variance ratio tests in the context of serial correlation. The ratio of variances may be expressed as the quotient of the variance of  $q$  periods divided by the variance of a single period, resulting in a value of 1. In this context, when  $VR(q) = 1$ , the series exhibits characteristics of a random walk process. When the null hypothesis is rejected, yet the variance ratio  $VR(q) > 1$ , it suggests the presence of a positive correlation. Conversely, when the variance ratio  $VR(q) < 1$ , it implies negative correlations in the series.

### 4. RESULTS

**Figure 1** shows the evolution of the 12 cryptocurrencies under consideration, namely Bitcoin (BTC), DASH, EOS, Ethereum (ETH), Lisk (LSK), Litecoin (LTC), Monero (XMR), NEO, Quantum (QUA), Ripple (XRP), Stellar, and ZCASH, between January 2, 2018, and March 1, 2023. The first months of 2020 saw the convergence of the first wave of the COVID-19 pandemic and the oil price war between Russia and Saudi Arabia. The behavior of the cryptocurrencies under investigation exhibits heightened volatility throughout the second and third quarters of 2021, highlighting significant structural breaks. As early as 2022, the time series analysis of the cryptocurrencies under investigation reveals visible fluctuations, which can be attributed to

the impact of the Russian invasion of Ukraine and the resulting uncertainty surrounding inflation. These fluctuations indicate the presence of structural breaks, but with lesser significance when compared to the global COVID-19 pandemic. The authors [Pardal et al. \(2022\)](#), [Dias et al. \(2022\)](#), and [Teixeira et al. \(2022\)](#) have also presented these findings in the context of international financial markets.



**Figure 1.** Evolution, in levels, of the cryptocurrencies under analysis, from January 2, 2018, to March 1, 2023

**Source:** Own elaboration (Software: Eviews12)

**Table 1** is a summary of the main descriptive statistics, measured in returns, of the 12 cryptocurrencies studied in this research for the whole sample period. It also shows the results of the [Jarque and Bera \(1980\)](#) adherence test. In relation to the mean returns, it is seen that just 2 cryptocurrencies, namely BTC (0.000571) and ETH (0.000467), exhibit positive mean returns, while the other digital currencies experience negative mean returns. In relation to the standard deviation, it is seen that the LSK (0.075517) exhibits the highest level of dispersion, while the BTC (0.042613) has a comparatively lower and less volatile standard deviation. By conducting a validation of the assumption of a Gaussian distribution, we ascertain that the values of skewness and kurtosis for all digital currencies differ from 0 and 3, respectively. The confirmation of the [Jarque and Bera \(1980\)](#) adherence test additionally suggests that the time series under study deviates from a strictly normal distribution.

**Table 1.** Summary table of descriptive statistics, in returns, in respect of the cryptocurrencies under analysis, from January 2, 2018, to March 1, 2023

	Mean	Std. Dev.	Skewness	Kurtosis	Jarque-Bera	Probability	Observations
<b>BTC</b>	0.000571	0.042613	-0.474092	7.963501	1388.487	0.000000	1305
<b>DASH</b>	-0.001657	0.064197	-0.002465	9.467086	2274.138	0.000000	1305
<b>EOS</b>	-0.001529	0.066729	-0.146585	8.249220	1502.939	0.000000	1305
<b>ETH</b>	0.000467	0.056324	-0.359280	7.468006	1113.568	0.000000	1305
<b>LSK</b>	-0.002177	0.075517	5.579036	121.0497	764525.1	0.000000	1305
<b>LTC</b>	-0.000624	0.058194	-0.536404	7.605415	1215.867	0.000000	1305
<b>XMR</b>	-0.000562	0.055398	-0.504036	10.21548	2886.192	0.000000	1305
<b>NEO</b>	-0.001811	0.066035	-0.202070	7.828584	1276.646	0.000000	1305
<b>QUA</b>	-0.001604	0.073484	3.630120	73.43264	272607.3	0.000000	1305
<b>XRP</b>	-0.000684	0.062772	0.674267	15.81223	9024.711	0.000000	1305
<b>STELLAR</b>	-0.001049	0.061881	-0.801490	24.18074	24533.64	0.000000	1305
<b>ZCASH</b>	-0.001714	0.065196	-0.314126	6.004688	512.3676	0.000000	1305

**Source:** Own elaboration

In order to verify the assumption of stationarity for the time series pertaining to the cryptocurrencies Bitcoin (BTC), DASH, EOS, Ethereum (ETH), Lisk (LSK), Litecoin (LTC), Monero (XMR), NEO, Quantum (QUA), Ripple (XRP), Stellar, and ZCASH, we will employ a panel unit root test. Specifically, we will use the [Levin et al. \(2002\)](#) test as well as the [Im et al. \(2003\)](#) test. To validate the obtained results, we will also apply the [Dickey and Fuller \(1981\)](#) test and the [Phillips and Perron \(1988\)](#) test with the Fisher Chi-square transformation. To achieve stationarity, the decision was made to apply a logarithmic transformation to the first differences in the time series. This was done to align the time series in a way that would exhibit the characteristics of white noise, namely an average of 0 and a constant variance. By doing this, the assumption of stationarity was proven correct, as shown by the fact that the null hypothesis  $H_0$  was rejected at a significance level of 1% (Table 2).

**Table 2.** Summary table of panel unit root tests, in returns, concerning the cryptocurrencies under analysis, from January 2, 2018, to March 1, 2023

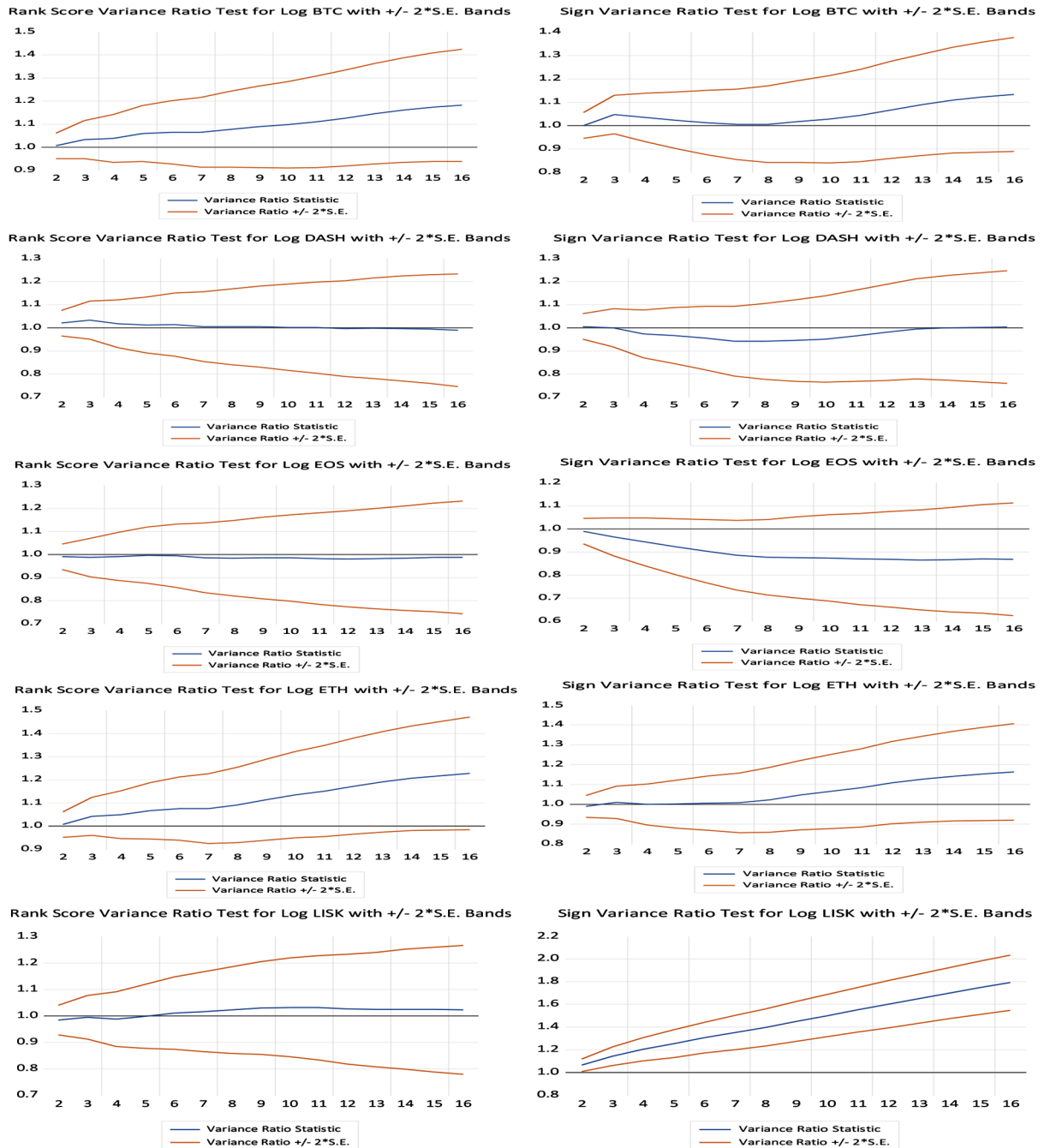
Group unit root test: Summary				
Method	Statistic	Prob.*	Cross-sections	Obs.
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t	-101.661	0.0000	12	15608
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-91.7055	0.0000	12	15608
ADF - Fisher Chi-square	1653.61	0.0000	12	15608
PP - Fisher Chi-square	1107.54	0.0000	12	15636

**Note:** \* Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality

**Source:** Own elaboration

In order to answer the research question, we used [Wright's \(2000\)](#) non-parametric test, which comprised the variance tests of Ranking and Signals, from January 2, 2018, to March 1, 2023. The proposed approach involves the use of two separate tests: one for homoscedastic series, referred to as the ranking test, and another for heteroscedastic sets, known as the signal test. These tests are applied to lag periods ranging from 2 to 16 days. The digital currencies BTC, ETH, LSK, NEO, QUA, and STELLAR exhibit positive serial autocorrelation in both the Rankings and Signals tests, indicating that cryptocurrency price movements are not entirely random and are influenced by previous price fluctuations. These indicators may point to exaggerated investor reactions to new market information. In such a case, any positive news or information regarding a certain cryptocurrency has the potential to induce a rise in its value as investors cultivate a heightened sense of optimism over its future potential. Consequently, a further rise in purchases might be expected, thus contributing to further price escalations. The DASH, EOS, and LTC cryptocurrencies exhibit a balanced performance in the Rankings test while showing negative serial autocorrelation in the Signals test. The cryptocurrencies XMR and XRP exhibit negative autocorrelation in the Ranking test and positive autocorrelation in the Signals test. On the other hand, ZCASH displays both positive and negative autocorrelation in both the homoscedastic and heteroscedastic tests. In pragmatic terms, the movements in bitcoin prices are driven by previous upward and downward price trends. In the given context, investors may exhibit different reactions to both positive and negative news or information related to a certain cryptocurrency. The dissemination of favorable information might potentially result in an increase in the value of the coin as investors exhibit heightened optimism toward its future possibilities. Nevertheless, the extent of the price increase can be comparatively lesser in the presence of only positive serial autocorrelation. Likewise, spreading negative news may result in

a sale, as investors' outlook on the future potential of the coin becomes gloomier. In summary, the presence of positive and negative serial autocorrelation in cryptocurrencies may contribute to lower volatility and more rational price fluctuations. This may facilitate enhanced decision-making for investors since it reduces the likelihood of being swayed by exaggerated reactions to news or information. The findings show the presence of both positive and negative autocorrelations within the cryptocurrency markets, which have the potential to result in more moderated price fluctuations and a lower level of volatility. This may assist investors in making better-informed decisions since it reduces the possibility of being influenced by exaggerated reactions to news or information.



**Figure 2.** Results of the Rank and Sign Variance Ratio tests in respect of the cryptocurrencies under analysis, from January 2, 2018, to March 1, 2023

**Source:** Own elaboration (Software Eviews12)



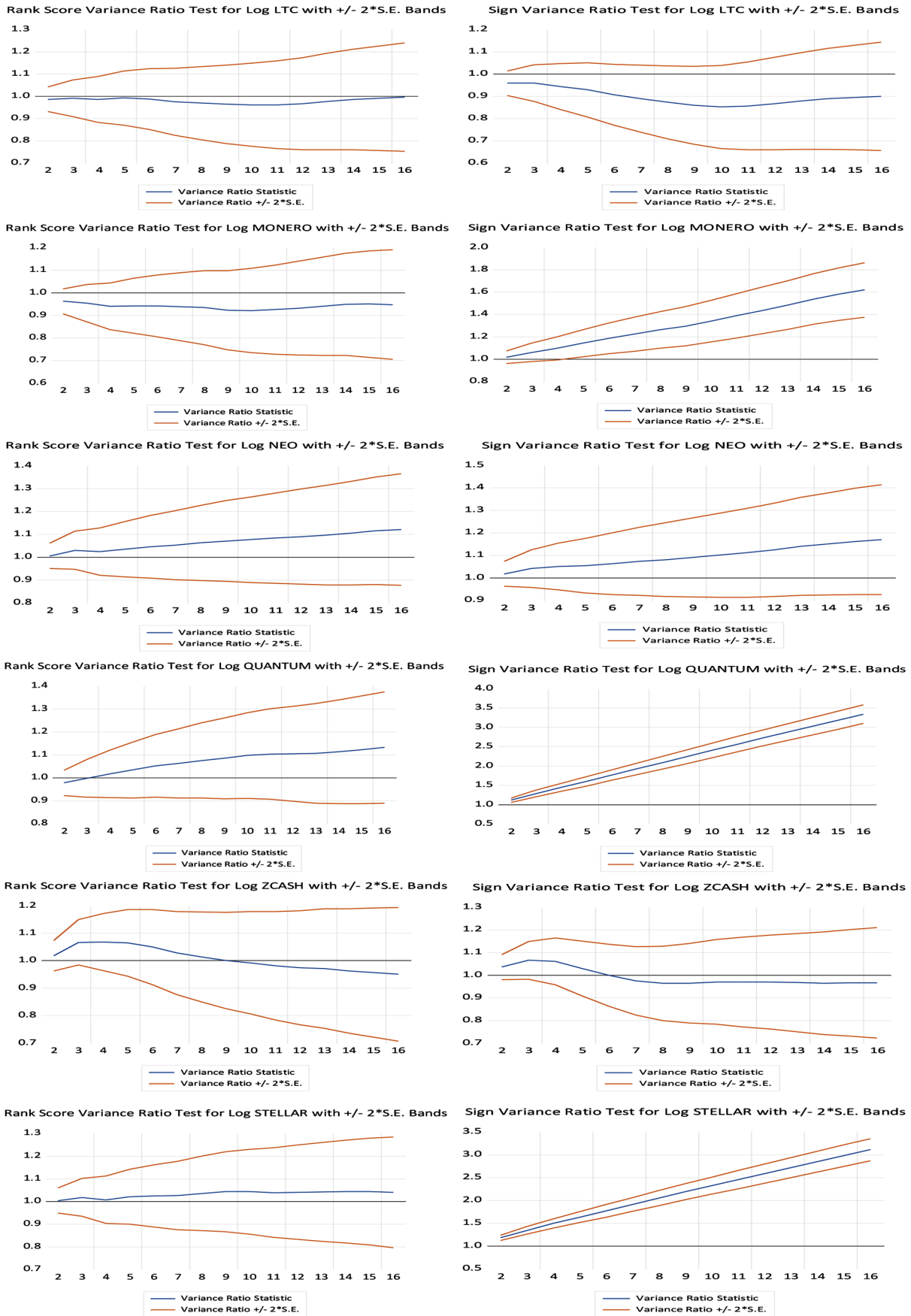


Figure 2. Continued

Source: Own elaboration (Software Eviews12)

## 5. CONCLUSION

This study aimed to examine if the prices of Bitcoin (BTC), DASH, EOS, Ethereum (ETH), Lisk (LSK), Litecoin (LTC), Monero (XMR), NEO, Quantum (QUA), Ripple (XRP), Stellar, and ZCASH are subject to exaggerated investor reactions. The findings show the presence of both positive and negative autocorrelations within the cryptocurrency markets, which have the potential to result in more moderated price fluctuations and a lower level of volatility. This may assist investors in making better-informed decisions since it reduces the possibility of being influenced by exaggerated reactions to news or information. Nevertheless, the cryptocurrency markets exhibit a high degree of complexity and volatility, whereby several variables exert influence on pricing, hence making the execution of consistently lucrative trades a challenging task. Consequently, before diving into cryptocurrency markets, investors are advised to exercise prudence and assess their capacity to bear risks. Consequently, it is advisable for investors to constantly watch market fluctuations and adjust their investment strategies accordingly.

## References

- Amini, S., Gebka, B., Hudson, R., & Keasey, K. (2013). A review of the international literature on the short term predictability of stock prices conditional on large prior price changes: Microstructure, behavioral and risk related explanations. In *International Review of Financial Analysis* (Vol. 26). <https://doi.org/10.1016/j.irfa.2012.04.002>
- Antweiler, W., & Frank, M. Z. (2011). Do US Stock Markets Typically Overreact to Corporate News Stories? SSRN Electronic Journal. <https://doi.org/10.2139/ssrn.878091>
- Bondt, W. F. M. D., & Thaler, R. (1985). Does the Stock Market Overreact? *The Journal of Finance*, 40(3), 793. <https://doi.org/10.2307/2327804>
- Chen, M. W., & Zhu, J. (2005). Do Investors in Chinese Stock Market Overreact? *Journal of Accounting and Finance Research*, 13(3).
- De Bondt, W. F. M., & Thaler, R. H. (2012). Do Analysts Overreact? In *Heuristics and Biases*. <https://doi.org/10.1017/cbo9780511808098.040>
- Diaconășu, D. E., Mehdian, S., & Stoica, O. (2022). An analysis of investors' behavior in Bitcoin market. *PLoS ONE*, 17(3 March). <https://doi.org/10.1371/journal.pone.0264522>
- Dias, R., Pardal, P., Teixeira, N., & Horta, N. (2022). Tail Risk and Return Predictability for Europe's Capital Markets : An Approach in Periods of the. December. <https://doi.org/10.4018/978-1-6684-5666-8.ch015>
- Dickey, D., & Fuller, W. (1981). Likelihood ratio statistics for autoregressive time series with a unit root. *Econometrica*, 49(4), 1057–1072. <https://doi.org/10.2307/1912517>
- Im, K. S., Pesaran, M. H., & Shin, Y. (2003). Testing for unit roots in heterogeneous panels. *Journal of Econometrics*. [https://doi.org/10.1016/S0304-4076\(03\)00092-7](https://doi.org/10.1016/S0304-4076(03)00092-7)
- Jarque, C. M., & Bera, A. K. (1980). Efficient tests for normality, homoscedasticity and serial independence of regression residuals. *Economics Letters*, 6(3). [https://doi.org/10.1016/0165-1765\(80\)90024-5](https://doi.org/10.1016/0165-1765(80)90024-5)
- Levin, A., Lin, C. F., & Chu, C. S. J. (2002). Unit root tests in panel data: Asymptotic and finite-sample properties. *Journal of Econometrics*, 108(1). [https://doi.org/10.1016/S0304-4076\(01\)00098-7](https://doi.org/10.1016/S0304-4076(01)00098-7)
- Pardal, P., Dias, R., Teixeira, N., & Horta, N. (2022). The Effects of Russia's 2022 Invasion of Ukraine on Global Markets : An Analysis of Particular Capital and Foreign Exchange Markets. <https://doi.org/10.4018/978-1-6684-5666-8.ch014>

- Phillips, P. C. B., & Perron, P. (1988). Testing for a unit root in time series regression. *Biometrika*, 75(2), 335–346. <https://doi.org/10.1093/biomet/75.2.335>
- Schaub, M. (2022). Outlier Events in Major Cryptocurrency Markets: Is There Evidence of Overreaction? *Journal of Wealth Management*, 24(4). <https://doi.org/10.3905/JWM.2021.1.155>
- Shiller, R. J. (2022). U.S. Stock Markets 1871-Present and CAPE Ratio. In Online Data Robert Shiller.
- Teixeira, N., Dias, R. T., Pardal, P., & Horta, N. R. (2022). Financial Integration and Comovements Between Capital Markets and Oil Markets: An Approach During the Russian Invasion of Ukraine in 2022. *Advances in Human Resources Management and Organizational Development*, 240-261. <https://doi.org/10.4018/978-1-6684-5666-8.ch013>
- Urquhart, A. (2018). What causes the attention of Bitcoin? *Economics Letters*, 166. <https://doi.org/10.1016/j.econlet.2018.02.017>
- Vats, A., & Kamaiah, B. (2011). Is There a Random Walk in Indian Foreign Exchange Market? *International Journal of Economics and Finance*, 3(6), 157–165. <https://doi.org/10.5539/ijef.v3n6p157>
- Wen, Z., Bouri, E., Xu, Y., & Zhao, Y. (2022). Intraday return predictability in the cryptocurrency markets: Momentum, reversal, or both. *North American Journal of Economics and Finance*, 62. <https://doi.org/10.1016/j.najef.2022.101733>
- Wright, J. H. (2000). Alternative variance-ratio tests using ranks and signs. *Journal of Business and Economic Statistics*. <https://doi.org/10.1080/07350015.2000.10524842>





# The Impact of the Economic, Energy Crisis and the Geopolitical Context on the Price of Construction

Mircea-Sebastian Mancia<sup>1</sup>   
Gabriela A. Popoviciu<sup>2</sup>   
Aurora Mancia<sup>3</sup> 

Received: August 23, 2023  
Accepted: November 16, 2023  
Published: March 16, 2024

## Keywords:

Economic and energetic crises;  
Geopolitics context;  
Price of constructions



Creative Commons Non Commercial CC BY-NC: This article is distributed under the terms of the Creative Commons Attribution-Non-Commercial 4.0 License (<https://creativecommons.org/licenses/by-nc/4.0/>) which permits non-commercial use, reproduction and distribution of the work without further permission.

**Abstract:** *Humanity is facing a series of overlapping crises: the health crisis, the energy crisis, the economic crisis and the crisis caused by Russia's aggression against Ukraine. After the era of globalization, the slowdown of international trade and the change of economic flows, the Romanian economy could be revived through foreign investments relocated to Romania and Romanian investments. The construction sector is strongly influenced by these phenomena. In this context, malfunctions also appeared in the construction infrastructure chains. It is found that it is necessary to adapt to autonomy in the supply of raw materials, the development, modernization and technology of our capacities as a response mechanism. In this acceptance, through this paper, the authors intend to design the impact of the actual crises (energetic and economic) in the construction field and the prices.*

## 1. INTRODUCTION

Currently, there is a migration of the young population towards the poles of economic development: the demand for living spaces is increasing, although there are price increases in the real estate sector, against the background of the increase in the price of construction materials, labor and bank rates. In some areas, the real estate market shows signs of slowing down, the determining factors are inflation and overlapping crises in the years 2021-2022. The construction sector and sales prices reflect the European and national context: less is bought and more expensive to build (Materials Exchange, 2023). The current economic crisis has affected the entire economy, globally, leading to its internationalization. The ecological crisis and the acute need to protect the environment also led to the exacerbation of the economic crisis. Economic growth worldwide was affected; the ability to foresee, to anticipate the evolution of economies in general was affected. Globalization, a factor with an impact on national economies, proved to be a “disturbing” element in the current economic crisis when the world balance was disturbed. Bad debts were incurred on the real estate market, debts that can no longer be paid to the banks. The price increases for construction materials, which are on average 60-80%, are generated by the crisis of raw materials, minerals, crude oil, and electricity (DailyBusiness.ro, 2022). In Romania, the construction sector was a performing one. The dynamics of profit are decreasing. Labor costs have increased in addition to the increased costs of construction materials. Constructions for infrastructure, and public works, as well as those related to energy transition are important and represent strategic sectors of the state. They will have a positive impact on post-crisis development.

<sup>1</sup> University of Oradea, Faculty of Constructions, Cadastre and Architecture, 4 B. St. Delavrancea Street, 410058, Oradea, Bihor, Romania

<sup>2</sup> University of Oradea, Faculty of Environmental Protection, 26 Gen. Magheru Bld, 410048, Oradea, Bihor, Romania

<sup>3</sup> University of Oradea, Faculty of Constructions, Cadastre and Architecture, 4 B. St. Delavrancea Street, 410058, Oradea, Bihor, Romania

## 2. CONSTRUCTION MATERIALS INDUSTRY – THE MAIN COMPONENT OF THE FIELD OF CONSTRUCTION AND SUSTAINABLE DEVELOPMENT OF ITS

The price of construction materials has increased significantly in recent years. Sustainable adaptation, using innovative and non-polluting solutions, would lead to the execution of construction works in which the price of materials, labor, and the quality of the projects, would be in balance.

It is very important to reduce production costs without affecting services or products; this is difficult to achieve, taking into account the current geopolitical context.

The building materials industry, as the main component of the construction field, must respond to the requirements of sustainable development, with effective solutions that pollute as little as possible. The correct management applied in development strategies is what increases the productivity of resources in the circular economy, where the gradual reduction of waste, recycling, and reuse - where possible - will be approaches of the future.

The sanitary crisis, the energy crisis and the war between Ukraine and Russia led to a rapid increase in the price of construction materials.

According to the Report made by the [National Strategy and Forecast Commission \(2023\)](#) for the year 2023, it is estimated that the price evolution of construction materials will be +8.4% compared to the previous year, 2022.

The growth reported in the first months of 2023 is different from the estimated one. According to the [National Strategy and Reform Commission \(2023\)](#), the estimated weight of constructions in the structure of the gross domestic product - in May 2023 - is 6.7%.

In Romania, growth is also determined by the demand for new buildings, efficient from an ecological and energetic point of view. Infrastructure and industrialization projects determine a greater demand for construction materials. New, efficient technologies are used on the construction site, with a superior quality of the built works, prefabricated products are becoming more and more used, being effective in terms of yield and quality of work.

Romania imports 70% of construction materials. For bitumen, for example, there is only one producer in the country (The Vega Refinery in Ploiesti). The Romanian government has approved a multi-year aid scheme for road construction material producers ([Laurentiu, 2023](#)). According to the data, the increases are considerable for asphalt 46%, crushed stone 22%; to other materials, such as copper conductors 46%, polystyrene EPS 80, 36%, ceramic blocks 15%. Increases are reported as of December 2022.

The three superimposed crises - sanitary, economic, and energetic, but also the war on the border, made it difficult to purchase raw materials and ready-made materials for construction.

The constant growth of the urban population forces cities to build new residential spaces; their demand is increasing even though the price of materials, labor, and, implicitly, construction is constantly increasing. According to the [World Bank \(2022\)](#), in Romania, the percentage of urban population was 34% in 1960 and 54.4% in 2014. From the provisional results of the 2022 Census, the urban population represents 56.2% ([National Institute of Statistics, 2022](#)).

According to Eurostat (2018), Romania ranks first at the overcrowding rate of 48.8%, while the European average is 16.6%; it is about the number of rooms in a house and how many people live in the respective housing unit.

According to the press release of the Council of Europe (2023) regarding the Regulation on construction products, it is specified that:

- we want a fairer competition in this field,
- a more ecological and circular European construction industry,
- common European standards for the free circulation of construction products and materials,
- the purchase of materials that comply with mandatory environmental requirements,
- incentives for the purchase of these ecological construction materials,
- supporting local communities considering that the construction sector represents 5.5% of the EU GDP, with approx. 25 million employees, workers, in general, in small and medium enterprises.

In the current European and world geopolitical context, it is necessary to reset some priorities, to mobilize development resources by identifying vulnerabilities and eliminating them. The benefits of sustainable development must be greater than its implementation costs.

### 3. THE NATIONAL SECTORAL DEVELOPMENT AS PRIORITY IN THE CONSTRUCTION FIELD

National sectoral development is a priority considering that the construction field represents 7% of Romania's GDP in 2022 - according to the National Institute of Statistics (2022).

Construction materials must be modernized according to European and world standards. According to Ciutina (2022), "construction materials have a major impact on the environment quantified by:

- altering the environment through mining or deforestation,
- the source, size, or method of restoring the raw material,
- the content of recyclable elements in the finished product,
- the production energy of the finished product,
- energy consumed during transport,
- the energy consumed to put the product into operation,
- the energy required at the end of the life cycle,
- the emissions resulting from the use of a unit of material,
- the impact of secondary products,
- the emissions resulting during use (toxic emissions)."

The transition to non-polluting, environmentally friendly construction materials will have an impact on prices, which will increase for these reasons as well.

An alternative for sustainable development in the field of construction is the use of wood (Dimmer, 2022). It has a minimal impact on the environment and presents benefits regarding:

- implementation performance,
- quick execution,
- durable over time,
- low weight regarding loading/m<sup>2</sup>,

- does not affect health,
- recycling,
- reuse,
- minimal impact on the environment.

According to EU statistics, buildings use 50% of resources, 40% of energy consumption and 25% of municipal waste. The use of wood where possible from a structural point of view is also beneficial from the perspective of sustainable development.

**Pele (2023)** shows that: “Conventional wisdom says that globalization will suffer as a result of the pandemic and Russia’s war in Ukraine. The measures of the White House to reorient production to more “friendly” states and to prevent China’s access to advanced technologies are seen as steps in the opposite direction of a robust global trading system. The big risk to the global trading system is a military confrontation between the US and China.”

Following the events that started in 2020 with the health crisis and which are still ongoing, as a result of geopolitical and economic factors, a shift from globalization to large regions is observed.

According to **Iacomi (2022)**, “We have lived with the phenomenon of globalization which means investing, acting, and living as if there would be borders. It was a phenomenon that lasted 40 years, but which we can say has ended.”

On a global, European and national level, the prices of construction materials have registered consistent increases, with record values in 2022 (**Chira, 2023**).

The major factors that influenced the price increase in construction are:

- the health crisis - COVID-19 superimposed on the energy crisis which resulted in the price increase of construction materials;
- inflation and transport prices;
- the war in Ukraine affecting supply chains;
- the earthquake in Turkey; Romania imports construction materials from this country;
- the increase in the price of labor and, implicitly, construction materials.

Because Romania imports more than 70% of construction materials, the prices on the international profile markets influence the domestic market. Where there is national production, the raw material is imported.

Steel rebars, for example, recorded a price increase that exceeded 60% in many other countries, not only in Romania - where its value doubled (table 1).

**Table 1.** Statistics regarding the increase in the prices of steel rebar at the international level, in 2021

Country	The price difference increase in 2021 compared to 2020 (%)
Spain	64
France	>70
Germany	>70
Italy	110

Source: **PlanRadar, 2023**



According to studies on the evolution of prices for construction materials in Romania, and studies of construction publications, the situation between April 2020 and April 2023 is presented as follows the Table 2.

**Table 2.** The price evolution of construction materials in Romania in the period between April 2020 and April 2023

Material	April 2020	April 2021	April 2022	April 2023
Cement	0,50 lei/kg	0,55 lei/kg	0,71 lei/kg	0,75 lei/kg
Smooth concrete steel	3,67 lei/kg	4,39 lei/kg	5,74 lei/kg	6,06 lei/kg
OSB boards	33,24 lei/buc.	38,18 lei/buc.	59,49 lei/buc.	45,72 lei/buc.
Expanded polystyrene	49,50 lei/bax	48,00 lei/bax	83,50 lei/bax	75,84 lei/bax
Brick	8,00 lei/buc.	8,33 lei/buc.	12,21 lei/buc.	13,02 lei/buc.

Source: Revista BURSA Construcțiilor, 2023

According to Vasiliu (2023) “In 2023, some construction materials started to become cheaper in order not to lose the market”. The calculations of the platform [www.vindem.ieftin.ro](http://www.vindem.ieftin.ro) show that metal sheet roofs have become cheaper by 20%, and OSB by 40%. The reductions refer to the year 2022 and they are found only in some companies, based on the principle of the free market.

Falling demand, distributors were forced to lower the price of some construction materials. That is why the forecast of specialists in this field remains reserved.

#### 4. CONCLUSION

In the context of sustainable development, and respecting environmental protection, the requirements in the field of construction are changing radically.

Globally, efforts are being made to develop new technologies, reduce the use of classic raw materials, reduce energy in the production process, and reduce CO<sub>2</sub> emissions.

The high costs of construction materials lead to a decrease in demand. The ongoing projects were budgeted at certain prices which, in some cases, almost doubled.

On the international level, the specialists do not foresee decreases in the following time intervals.

The transition to green energy means the use of materials, such as steel, copper, and aluminum, materials that are also used in construction. An increased demand for these raw materials will result. The law of supply and demand on the market for these resources will keep prices high.

The construction sector as an economic activity has a significant impact on the environment. E.U. proposed ambitious objectives in protecting the environment in the field of construction materials and the construction of industrial housing objectives.

The 2030 Agenda for Sustainable Development implies the application of strategies to which Romania has also aligned by adopting the “National Strategy for Sustainable Development of Romania - 2030” (Government of Romania, 2018; UN General Assembly, 2015). Articles 9 and 11 of the 2030 Agenda give clear directives regarding infrastructure, sustainable industrialization, and the development of human settlements that are open to all, safe, resilient and sustainable.

The current geopolitical, economic and health context have proven that the development of loyal and regional industries represents an alternative to globalism in cases of force majeure.

In July 2023, the Government of Romania developed and approved the Emergency Ordinance regarding the National Program for the development of the eternal production of construction products and materials no. 68/2023 (2023). This aims to encourage and stimulate the national industry to reduce the effects of the economic crisis. It is proposed, among other things, regional development through the establishment of the “National Program for the development of domestic production of construction products and materials - CONSTRUCTPLUS.” The proposal is based on EU regulation no. 651/2014 ([Official Journal of the European Union, 2014](#)).

The program encourages the domestic production of construction materials and the reduction of imports, unblocking construction sites and ensuring the implementation of projects in the current market.

## References

- Chira, A. (2023). What are the prices of the main construction materials? *Economica*. Retrieved July 12, 2023, from [www.economica.net](http://www.economica.net)
- Ciutina, A. (2022). The impact of constructions on the environment - university course. UPT Timisoara.
- Council of Europe. (2023). Press release: Regulation on construction products. Retrieved July 12, 2023, from [www.council.europa.eu](http://www.council.europa.eu)
- DailyBusiness.ro. (2022, December 2). The effects of the crisis in construction: distributors reduced prices. Retrieved July 12, 2023, from [www.dailybusiness.ro](http://www.dailybusiness.ro)
- Dimmer. (2022). *The use of wood as a construction material in the context of sustainable development*, <https://www.mydimmerhome.com/2022/06/29/folosirea-lemnului-ca-material-de-constructii-in-contextul-dezvoltarii-sustenabile/>
- Eurostat. (2018). Statistics on housing in the EU. Retrieved July 12, 2023.
- Government of Romania. (2018). The national sustainable development strategy of Romania 2023, approved by H.G. no. 877 of 9 Nov. 2018.
- Government of Romania. (2023). O. G. no. 68/2023. The national program for the development of domestic production of construction products and materials.
- Iacomì, A. (2022). Globalization has ended; a regionalized world is forming. *Bursa Journal*.
- Laurentiu, G. (2023). Government course: State aid for the construction materials industry.
- Materials Exchange. (2023). Why did construction materials become more expensive in Romania?
- National Institute of Statistics. (2022). Productivity in construction 2022.
- National Institute of Statistics. (2022). Provisional results of the 2022 national census.
- National Strategy and Forecast Commission. (2023). Report for the year 2023.
- National Strategy and Reform Commission. (2023). Macroeconomic forecasts.
- Official Journal of the European Union. (2014). Regulations Commission Regulation (EU) No 651/2014 of 17 June 2014 declaring certain categories of aid compatible with the internal market in application of Articles 107 and 108 of the Treaty.
- PlanRadar. (2023, May 5). *The price of construction materials in 2023 in Romania*. Retrieved July 12, 2023, from [www.plan.radar.com](http://www.plan.radar.com)
- Revista BURSA Construcțiilor. (2023). Retrieved July 12, 2023, from [www.construciiibursa.ro](http://www.construciiibursa.ro)
- UN General Assembly. (2015). Agenda 2030, September 2015.
- Vasiliu, A. E. (2023). Business Construct: The real crisis is on the construction materials market. *Financial Newspaper*.
- World Bank. (2022). Romania in numbers - Report. Information about the country.



# Chaotic Economic Growth and Investment in Unmanned Aerial Systems: China and Russia

Vesna Jablanovic<sup>1</sup> 

Received: August 28, 2023  
Accepted: October 27, 2023  
Published: March 16, 2024

## Keywords:

Investment in Unmanned Aerial Systems;  
Economic growth;  
Chaos



Creative Commons Non Commercial CC BY-NC: This article is distributed under the terms of the Creative Commons Attribution-Non-Commercial 4.0 License (<https://creativecommons.org/licenses/by-nc/4.0/>) which permits non-commercial use, reproduction and distribution of the work without further permission.

**Abstract:** Originally viewed as a military tool, an unmanned aerial system (UAS), has important economic applications. The economic opportunity for an unmanned aerial system technology is large. The defense sector will remain the largest market for drones. This paper examines the economic growth stability in China and Russia. The basic aim of this paper is to create a relatively simple chaotic economic growth model. Investment in unmanned aerial systems is an important generator of economic growth and economic stability.

## 1. INTRODUCTION

Unmanned aerial system (UAS), plays significant economic roles with vast applications in various sectors. Drone technology holds immense economic potential, especially in defence, making it the primary market for these unmanned systems. Investing in UAS is crucial for stimulating economic growth.

According to [FAO \(2018\)](#), the increase in the use of small, unmanned aerial vehicles (UAVs), or drones, for agriculture is very important. Further, drones are used in various fields (the military, humanitarian relief, disaster management, agriculture, etc.).

In 2015, the terms “fourth agricultural revolution” or “agriculture 4.0” were proposed. These terms referred to the impact of sensors, satellites, digital technology, and robotics in agriculture.

According to the [EU Commission \(2021\)](#), North America held the largest drone market share of 25% in the year 2018. Farmers in the European region have been quite open to drones. India, China, South Korea, and Japan are the major countries in the market. Government initiatives, along with technological advancement, are boosting the market.

The economic applications for drone technology are large: (i) topographic survey; (ii) crop area mapping; (iii) monitoring yield, biomass and soil condition; (iv) crop water status; (v) early detection of disease; (vi) farm machinery monitoring, etc. ([EU Commission, 2021](#)).

As stated by [Kapustina et al. \(2021\)](#), the USA, China, and France are the biggest producers of commercial drones. The important drone producers are DJI (China), SenseFly / Parrot SA (France), Yuneec (China), and 3D Robotics (USA). The largest demand is made by the USA, China, Russia, Great Britain, Australia, France, Saudi Arabia, India, and South Korea.

<sup>1</sup> University of Belgrade, Faculty of Agriculture, Nemanjina 6, 11081 Belgrade, Serbia

More than 80% of commercial drones in the world are made by Chinese companies. In the early 2000s, unmanned aerial vehicles (UAV) were used mostly by the military. China is a major factor in the global military drone trade. Chinese military drones are produced by state-owned companies, in contrast to commercial drones, whose producers are almost all private companies. However, the government is increasingly involving itself in the commercial drone sector.

According to [Ipsos Business Consulting \(2019\)](#), the adoption of drones in China's agricultural sector is growing at a rapid pace. The number of agriculture drones is estimated to have doubled between 2016 and 2017. As the world's leading manufacturer of civilian drones, drone technology is readily available in China.

The basic aim of this paper is to create a relatively simple chaotic economic growth model that is capable of generating stable equilibrium, cycles, or chaos. Investment in unmanned aerial systems has an important role in this model. In this sense, it is important to analyze the economic growth stability in the period 1990-2023. in Russia and China.

## 2. THE MODEL

The chaotic economic growth model is presented by the following equations:

$$\frac{Y_{t+1} - Y_t}{Y_t} = \alpha + \beta I_t \quad (1)$$

$$I_{t,d} = \gamma I_t \quad (2)$$

$$I_{t,d} = \delta Y_t \quad (3)$$

with:  $Y$  – the gross domestic product (GDP),  $I$  – investment,  $I_d$  - investment in unmanned aerial systems,  $\alpha$  – the autonomous growth rate of the gross domestic product,  $\beta$  - the coefficient that explains the importance of investment for economic growth,  $\gamma$  - the share of investment that is used for investment in unmanned aerial systems,  $\delta$  - the share of the gross domestic product that is used for investment in unmanned aerial systems.

Now, putting (1), (2), and (3) together we immediately get:

$$Y_t = (1 + \alpha) Y_t + \left(\frac{\beta\delta}{\gamma}\right) Y_t^2 \quad (4)$$

Further, it is assumed that the current value of the gross domestic product (GDP) is restricted by its maximal value in its time series. It is important to introduce  $y$  as  $y = Y / Y^m$ , where  $Y^m$  is the maximal value of GDP in its time series. Thus  $y$  ranges between 0 and 1. Now, the GDP growth rate is

$$y_t = (1 + \alpha)y_t + \left(\frac{\beta\delta}{\gamma}\right) y_t^2 \quad (5)$$

This model given by equation (5) is called the logistic model. [Lorenz \(1963\)](#) discovered this effect - the lack of predictability in deterministic systems. Sensitive dependence on initial conditions is one of the central ingredients of what is called deterministic chaos.

### 3. THE LOGISTIC EQUATION

It is possible to show that the iteration process for the logistic equation

$$z_{t+1} = \pi z_t (1 - z_t), \pi \in [0, 4], z_t \in [0, 1] \quad (6)$$

is equivalent to the iteration of the growth model (5) when we use the identification

$$z_t = - \left[ \frac{\beta \delta}{(1 + \alpha)\gamma} \right] y_t$$

And

$$\pi = (1 + \alpha) \quad (7)$$

Using (5) and (7) we obtain:

$$\begin{aligned} z_{t+1} &= - \left[ \frac{\beta \delta}{(1 + \alpha)\gamma} \right] y_{t+1} = - \left[ \frac{\beta \delta}{(1 + \alpha)\gamma} \right] \left[ (1 + \alpha)y_t + \left( \frac{\beta \delta}{\gamma} \right) y_t^2 \right] = \\ &= - \left( \frac{\beta \delta}{\gamma} \right) y_t - \left[ \frac{\beta^2 \delta^2}{(1 + \alpha)\gamma^2} \right] y_t^2 \end{aligned}$$

On the other hand, using (6) and (7) we obtain:

$$\begin{aligned} z_{t+1} &= \pi z_t (1 - z_t) = \\ &= -(1 + \alpha) \left[ \frac{\beta \delta}{(1 + \alpha)\gamma} \right] y_t \left\{ 1 + \left[ \frac{\beta \delta}{(1 + \alpha)\gamma} \right] y_t \right\} = - \left( \frac{\beta \delta}{\gamma} \right) y_t - \left[ \frac{\beta^2 \delta^2}{(1 + \alpha)\gamma^2} \right] y_t^2 \end{aligned}$$

Thus we have that iterating (5) is really the same as iterating (6) using (7). It is important because the dynamic properties of the logistic equation (6) have been widely analyzed (Li & Yorke, 1975; May, 1976). It is obtained that: (i) For parameter values  $0 < \pi < 1$  all solutions will converge to  $z = 0$ ; (ii) For  $1 < \pi < 3,57$  there exist fixed points the number of which depends on  $\pi$ ; (iii) For  $1 < \pi < 2$  all solutions monotonically increase to  $z = (\pi - 1) / \pi$ ; (iv) For  $2 < \pi < 3$  fluctuations will converge to  $z = (\pi - 1) / \pi$ ; (v) For  $3 < \pi < 4$  all solutions will continuously fluctuate; (vi) For  $3,57 < \pi < 4$  the solution become “chaotic”.

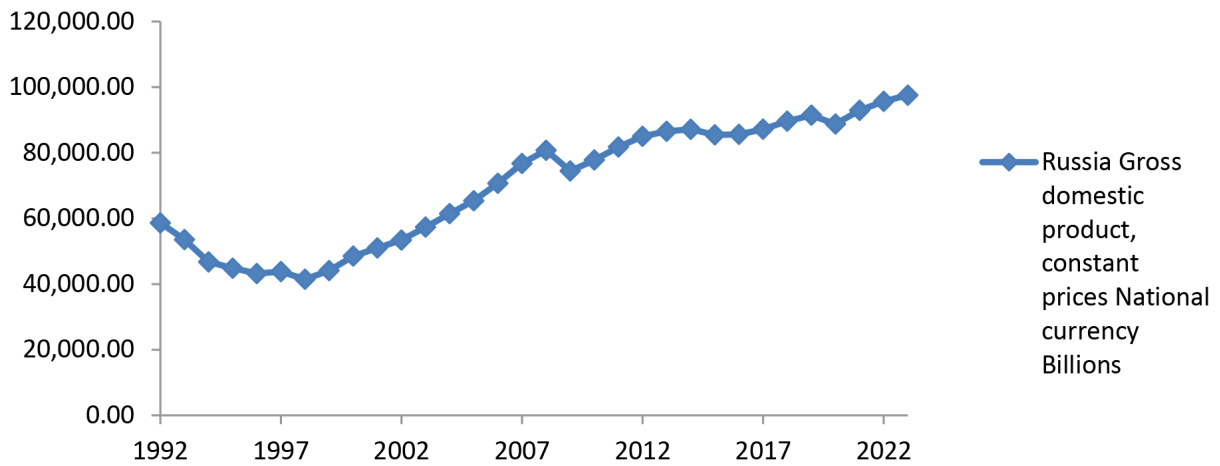
### 4. EMPIRICAL EVIDENCE

The main aim of this paper is to analyze the economic growth stability in the period 1990-2023. in Russia and China. In this sense, it is important to use the logistic model (8):

$$y_{t+1} = \pi y_t + v y_t^2 \quad (8)$$

where:  $y = Y / Y^m$ ,  $Y$  – the gross domestic product (GDP),  $\pi = (1 + \alpha)$ ,  $v = (\beta \delta / \gamma)$ ,  $\alpha$  – the autonomous growth rate of the gross domestic product,  $\beta$  – the coefficient that explains the importance of investment for economic growth,  $\gamma$  – the share of investment that is used for investment in unmanned aerial systems,  $\delta$  – the share of the gross domestic product that is used for investment in unmanned aerial systems.

Now, the model (8) is estimated (see Tables 1-2).



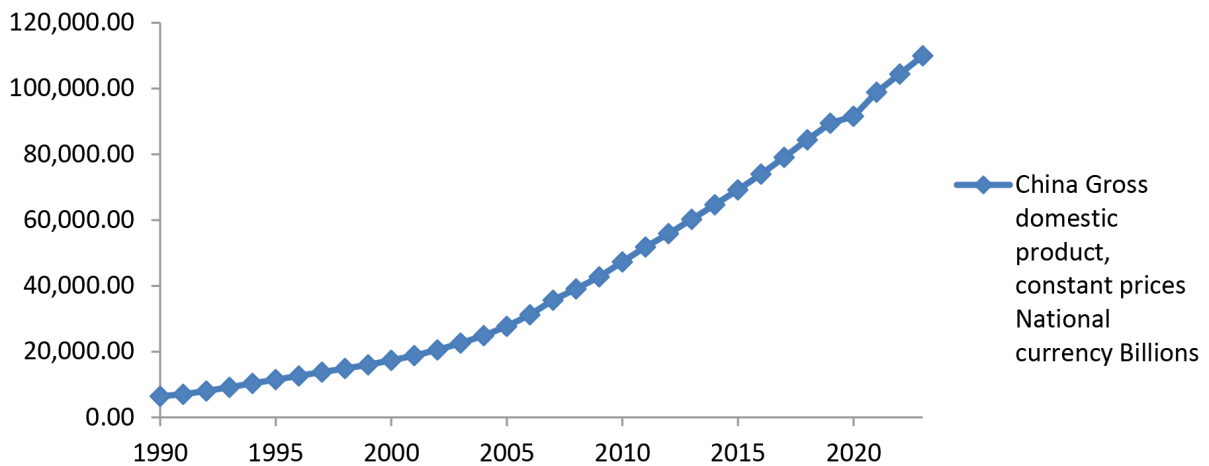
**Figure 1.** The gross domestic product, constant prices, national currency, billions: Russia, 1990-2023.

Source: IMF, n.d.

**Table 1.** The estimated model (8): Russia, 1992-2023.

Russia	R=0.98396 Variance explained: 96.818%		
		$\pi$	$\upsilon$
	Estimate	1.03107	0.016529
	Std. Err.	0.04489	0.055099
	t(31)	22.96663	0.299977
p-level	0.00000	0.766334	

Source: Own calculations



**Figure 2.** The gross domestic product, constant prices, national currency, billions: China, 1990-2023.

Source: IMF, n.d.

**Table 2.** The estimated model (8): China, 1990-2023.

China	R=0.99911 Variance explained: 99.883%		
		$\pi$	$\upsilon$
	Estimate	1.11920	0.074659
	Std. Err.	0.01337	0.018366
	t(31)	83.69362	4.065043
p-level	0.00000	0.000305	

Source: Own calculations

The real gross domestic product fluctuated between 58,646.99 and 97,563.46 (unit of measure: national currency in bn, constant prices) in the period 1990-2023 in Russia.  $\pi$  was 1.03107. Further, according to the logistic equation (9), for  $1 < \pi < 2$  all solutions monotonically increase in Russia in the observed period.

The real gross domestic product fluctuated between 6,430.86 and 109,933.25 (unit of measure: national currency in bn, constant prices) in the period 1990-2023 in China.  $\pi$  was 1.11920. Further, according to the logistic equation (9), for  $1 < \pi < 2$  all solutions monotonically increase in China in the observed period.

## 5. CONCLUSION

This paper creates the chaotic economic growth model. Investment in unmanned aerial systems is an important part of this chaotic economic growth model. A key hypothesis of this work is based on the idea that the coefficient  $\pi = (1 + \alpha)$  plays a crucial role in explaining the local economic growth stability, where,  $\alpha$  – the autonomous growth rate of the gross domestic product. An estimated value of the coefficient  $\pi$  confirms stable economic growth in Russia and China in the observed period.

## References

- EU Commission. (2021). Advanced Technologies for Industry—Product Watch Satellites and drones for less intensive farming and arable crops. Product Watch Report, <https://ati.ec.europa.eu/reports/product-watch/satellites-and-drones-less-intensive-farming-and-arable-crops>
- FAO. (2018). E-agriculture in Action: Drones for Agriculture, <http://www.fao.org/3/i8494en/i8494en.pdf>
- IMF. (n.d.). [www.imf.org](http://www.imf.org)
- Ipsos Business Consulting. (2019). China's Agriculture Drone Revolution Disruption in the Agriculture Ecosystem, <https://www.ipsos.com/sites/default/files/ct/publication/documents/2020-10/china-agriculture-drones.pdf>
- Kapustina, L., Izakova, N., Makovkina, E., & Khmelkov, M. (2021). The global drone market: main development trends. *SHS Web of Conferences*, 129, 11004. <https://doi.org/10.1051/shsconf/202112911004>
- Li, T.-Y., & Yorke, J. A. (1975). Period Three Implies Chaos. *The American Mathematical Monthly*, 82(10), 985-992. <https://doi.org/10.1080/00029890.1975.11994008>
- Lorenz, E. N. (1963). Deterministic Nonperiodic Flow. *Journal of the Atmospheric Sciences*, 20(2), 130-141. [https://doi.org/10.1175/1520-0469\(1963\)020<0130:dnf>2.0.co;2](https://doi.org/10.1175/1520-0469(1963)020<0130:dnf>2.0.co;2)
- May, R. M. (1976). Simple mathematical models with very complicated dynamics. *Nature*, 261(5560), 459-467. <https://doi.org/10.1038/261459a0>







# Contemporary Priorities in the Development of the General Agricultural Policy of the European Union

Krassimira Zagorova<sup>1</sup> 

Received: July 5, 2023

Accepted: October 27, 2023

Published: March 16, 2024

## Keywords:

European Union;  
Common Agricultural Policy;  
Contemporary priorities;  
European Agriculture  
Guarantee Fund



Creative Commons Non Commercial CC BY-NC: This article is distributed under the terms of the Creative Commons Attribution-Non-Commercial 4.0 License (<https://creativecommons.org/licenses/by-nc/4.0/>) which permits non-commercial use, reproduction and distribution of the work without further permission.

**Abstract:** *This study contains a retrospective analysis of the development of the Common Agricultural Policy of the European Union in modern conditions, spanning the period 2007-2013 up to the present 2020-2025 programming period. In particular, the object of analysis are the priorities in the agricultural sector of the Community, known as "key areas", defined in three main directions: (1) promotion of the competitiveness of farms in the agricultural and forestry sectors, (2) improvement of the environment and the natural assets in the agricultural regions, (3) improvement of the quality of life in rural areas. In the course of the analysis are reflected the trends of reducing the cost of intervention on agricultural markets with European Agriculture Guarantee Fund resources, particularly pronounced in the 2014-2020 programming period, still going on in the next indicative period after the year 2020. Finally, conclusions have been drawn, taking into account the invariability of the fundamental goals of the EU Common Agricultural Policy ever since its introduction by the Treaty of Rome (1958). In conclusion, it is pointed out that in parallel with the market and social goals protecting the interests of both European producers and consumers, the objectives of the European Agricultural Policy at this stage are complemented by new ones, which, by supporting primary agricultural activity, namely the production of foods, add other dimensions as well.*

## 1. INTRODUCTION

At the time when the Common European Market was established by the Treaty of Rome in 1958, the agriculture of the six founding Member States of the EU was characterized by strong state intervention. To include agricultural products in the free circulation of goods, while maintaining a certain public intervention in the agriculture sector, it is necessary to phase out interventional mechanisms at the national level, incompatible with the common market, and transfer them to the Community level (European Parliament, n.d.-a).

This is also the reason why the European policy in the agriculture sector at the Community level is established on the *basic principles of the single European market, community preferences, financial solidarity* and cooperation between the European Union and the governments of the Member States. The agricultural policy of the European Union ensures stability and predictability in the community's markets for agricultural products, sustainable purchase prices that guarantee stable earnings of agricultural producers, as well as an uninterrupted supply of quality food to consumers.

The European Union's Common Agricultural Policy is a dynamic policy responding to the changing challenges in the Community's agriculture sector by a series of reforms. These challenges find expression in the sustainable use of natural resources and sustainable management of agricultural lands, protection of biological diversity, environment and natural landscape, adaptation of agriculture to climate change, reduction of greenhouse gas emissions resulting from agricultural

<sup>1</sup> Technical University of Varna, 1 Studentska str., 9000 Varna, Bulgaria

activities, maintaining prosperous rural areas on the territory of the EU by overcoming serious difficulties in their demographic, socio-economic and infrastructural development.

Maintaining prosperous rural areas is one of the highest contemporary priorities of the European Union with a view to the fact that more than 56% of the population of the 27 Member States of the Community live there and occupy 91% of its territory.

Changes in the priorities of the agricultural policy of the European Union concerning its long-term development are achieved through reforms. In this regard, a comprehensive reform of the Common Agricultural Policy was launched in 1992, proceeding to a greater use of direct payments to farmers. Widespread application of the following mechanisms was also initiated: (1) temporary exclusion of agricultural lands from crop rotation; (2) reduction of customs duties and taxes on the import of agricultural goods; (3) step-by-step reduction of export subsidies, etc. (Dimov, 2010, p. 158, 159).

## **2. DEVELOPMENT OF THE COMMON AGRICULTURAL POLICY (CAP) OF THE EU**

The main rules and objectives laid down in the development of the Common Agricultural Policy (CAP) of the EU for the period 2007-2013, as well as the concrete measures for the Member States and regions, are set out in Council Regulation (EC) No. 1698/2005. Within the scope of the objectives listed in the said Regulation, the strategic directions in the development of CAP also determine the priorities in the agriculture sector for the Community, known as «thematic axes», defined in the following three main directions:

- (1) Increasing the competitiveness of the agriculture and forestry sectors;
- (2) Improvement of the environment and natural assets;
- (3) Improvement of the quality of life in rural areas.

Based on these strategic guidelines, each Member State prepares its own National Strategic Plan as a reference framework for the elaboration of a Rural Area Development Programme.

This approach has the following main goals (Turlakova, 2013, p. 50):

- to determine the areas in which the use of EU aid for rural area development generates the highest added value at the Union level;
- to ensure coherence with other EU policies and in particular in the areas of cohesion policy and environmental protection;
- to support the implementation of the new market-oriented CAP of the European Union and the necessary restructuring that it will lead to in the old and new Member States of the Union.

According to the principles and procedures of Council Regulation (EC) No. 1698/2005 as well as the National Strategic Plan for the Development of Agriculture of each country, the activities having to do with the development of the CAP for the period under consideration are partially funded by the European Union's agriculture budget and to some extent by the national and regional budgets of the individual Member States of the Community.

Beneficiaries of the Rural Area Development Programme are individuals and legal entities with an exceptionally diverse scope of activity, whose unifying component is the connection with the agriculture sector. Despite their wide range, potential beneficiaries under the main directions (axes) are grouped as follows (Turlakova, 2013, p. 50):

- **Beneficiaries under Priority Axis 1 are:** Farmers; semi-market farms; young farmers; producer organizations; people working in the agriculture and forestry sectors; forest owners, including their associations - private and municipal; micro-, small and medium-sized enterprises from the food processing sector; institutions or organizations providing advisory services, professional training and information activities in the agriculture sector;
- **Beneficiaries under Priority Axis 2 are:** Farmers from less-favored areas; farmers wishing to engage in organic farming; forest owners, including their associations; owners and/or users of forests and agricultural lands, whose areas fall within the scope of the European ecological network “Natura 2000”;
- **Beneficiaries under Priority Axis 3 are:** Rural area municipalities; agricultural producers; microenterprises; non-profit legal entities (including community centers); legal and natural persons, institutions providing education and qualification;
- **Beneficiaries under Priority Axis 4 are:** Local Initiative Groups (LIG); natural and legal persons, non-governmental organizations and municipalities in the regions where there is an approved and operating LIG. The agriculture, forestry and food processing sectors in Europe have an extremely high potential for the development of production of high-quality value-added products to meet the diverse and growing demands of the European consumer and the world markets.

**The financial resources allocated to Axis 1,** aim to contribute to a stronger agri-food sector by focusing on priorities related to knowledge and skills transfer, modernization and innovation technologies, quality throughout the food production chain and last but not least investing in physical and human capital. To meet the challenges of these priorities, Member States are encouraged to focus their support on key activities such as:

- *Restructuring and modernization of agricultural production, which continues to play an important role in the development of the economies of many rural areas<sup>2</sup>;*
- *Improving the integration (links) along the food production chain;*
- *Favoring innovative technologies in the agriculture and forestry sectors, as well as access to research and development.*

**The financial resources allocated under Axis 2,** intended to protect and increase the efficiency of the use of the natural resources and assets of the European Union and rural areas, are invested as a priority in three main areas at the EU level: (1) *maintaining biodiversity*, conservation and development of agriculture and forestry with a high environmental value, (2) *development of traditional agricultural activities* based on natural assets (3) *overcoming negative changes in water and climate*. To meet the challenges of these priorities, Member States are encouraged to focus their support on key activities such as:

- Preservation of natural assets and forests;
- Combating climate change;
- Promotion of environmental/economic initiatives;
- Development of the territorial balance, etc.

**The financial resources intended to diversify the rural economy and improve the quality of life in rural areas, allocated under Axis 3,** should contribute to the main priority - the creation

<sup>2</sup> Rural area - there is no unambiguous definition of a rural area in the European legislation and practice. According to OECD, a rural area is an area whose population density is below 150 people per square kilometer. According to the national definition, 231 municipalities are classified as rural municipalities in Bulgaria, namely 87% of the total of 264 municipalities. The areas of these municipalities cover 81% of the country's territory and 39% of the population.

of conditions for employment and growth. The range of measures eligible under Axis 3 contributes to the promotion of skills acquisition, capacity building and implementation of a local development strategy to ensure that rural areas remain attractive for future generations. In this case, the focus is more specifically put on the development of training, mastering new knowledge, including such related to the application of information technology and entrepreneurship, as well as taking actions related to the needs of women and young people as a priority.

To meet these priorities, Member States are encouraged to focus their support on certain key activities such as:

- Raising the level of economic activities and employment in the extended rural economy;
- Encouraging women and young people to enter the labor market.

### **3. MAIN STRATEGIC PRIORITIES OF THE COMMON AGRICULTURAL POLICY OF THE EU**

The main strategic priorities of the Common Agricultural Policy of the EU for the period 2014-2020 contribute to the realization of the “Europe 2020” strategy, promoting the competitiveness of the rural economy, the environmentally friendly management of natural resources and the balanced territorial development of the economies and communities in the agricultural regions.

*The main achievements of CAP for the period under consideration* are that its structuring in two complementary pillars is currently underway: 1/ by annual direct payments and market support to farmers (*first pillar* of CAP) and 2/ by multi-annual rural development measures (*second pillar* of CAP). Through direct payments under the first pillar, which are not linked to the amount of production, competitiveness in the agriculture sector is increased and farmers’ adaptation to the market is encouraged. Through concrete and targeted measures under the second pillar of CAP, the development of farms and rural settlements, the support of social capital and the protection of natural resources are ensured. This pillar allows Member States to direct EU co-financing to the most problematic areas of their territories (Naydenov, 2018, p. 14).

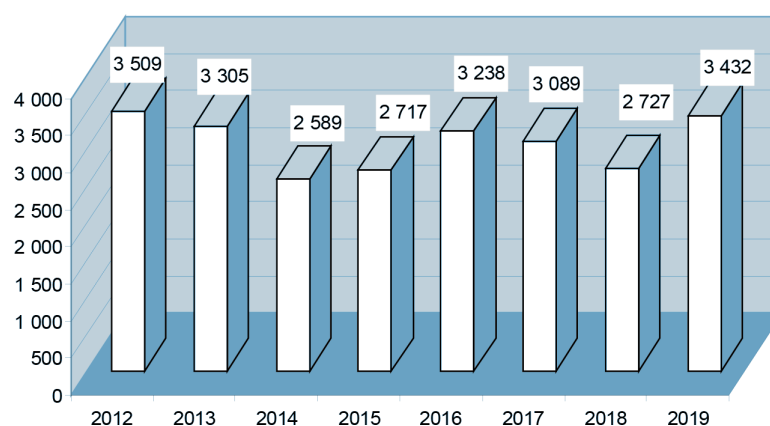
The period 2014-2020 sees consolidation (unification) of the two pillars of CAP: the first pillar, which finances direct aid and market measures, is fully financed by the European Agricultural Guarantee Fund (EAGF); the second pillar, which supports the development of rural areas, is co-financed. The modulation of direct aid in favor of the second pillar is discontinued and replaced by a mandatory reduction of basic payments of more than EUR 150,000 per year. This measure directly affects the amounts disbursed for financial support under the first pillar of the *European Agricultural Guarantee Fund (EAGF)*. A tendency to reduce the costs of intervention in the agricultural markets with funds from the EFG is also noticeable before the 2014-2020 indicative period.

The data contained in Table 1 show a restriction and decrease of the total intervention costs in the agriculture sector of the EU for the years 2014 and 2015, as for the period 2016-2019 there is again a marked growth, with a certain fluctuation towards reduction in 2018. The data also show a drastic reduction in the financial support intended for export refunds for agricultural products produced in the EU, the value of which reached EUR 1.1 million in 2019, compared to EUR 146.7 million in 2012, EUR 62.4 million in 2013, and EUR 4.5 million in 2014, after which they fell sharply to EUR 0.3 million in 2015, EUR 0.6 million in 2016, respectively, and so on (see table 1) (Zagorova, 2022, p. 4).

**Table 1.** Costs of interventions in agricultural markets from the European Agricultural Guarantee Fund (in millions of EUR, current prices)

Types of EAGF costs	2012	2013	2014	2015	2016	2017	2018	2019
Storage	17,4	25,1	5,1	18,4	52,4	27,6	182,3	3,0
Export refunds	146,7	62,4	4,5	0,3	0,6	0,0	0,2	1,1
Other market measures	3 344,5	3 217,2	2 579,6	2 698,0	3 185,2	3 061,1	2 544,6	2 427,8
<b>Total:</b>	<b>3 508,6</b>	<b>3 304,7</b>	<b>2 589,2</b>	<b>2 716,7</b>	<b>3 238,2</b>	<b>3 088,7</b>	<b>2 727,1</b>	<b>3 431,9</b>

Source: European Parliament, n.d.-b.

**Figure 1.** Amounts disbursed by the European Agricultural Guarantee Fund for support under the first pillar

Source: European Parliament, n.d.-b.

*For the period 2014-2020, better coordination of the measures intended for rural areas with the rest of the EU structural funds, including the European Social Fund, the European Regional Development Fund, the EU Cohesion Fund, as well as the European Investment Bank, is envisaged. The wide range of existing instruments under the second pillar of CAP is simplified to focus on supporting competitiveness, innovation, knowledge-based agriculture, entry of young farmers, sustainable management of natural resources, balanced territorial development, etc.*

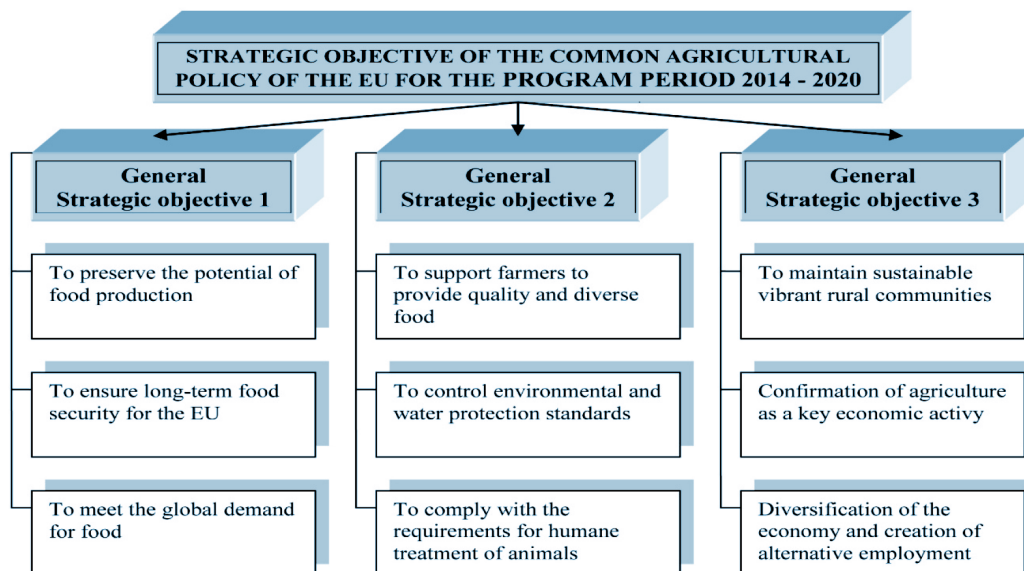
According to [Naydenov \(2018\)](#), “The main challenges to the Common Agricultural Policy of the EU after 2014 have to do with (1) food security and agricultural production; (2) environmental and climate changes and (3) ensuring territorial balance” (p.14).

*As the main role of agriculture is to provide food, it is of vital importance for EU agriculture to maintain a high production capacity. The EU is the world’s leading exporter of a wide range of mainly processed value-added and high-quality agricultural products ([Naydenov, 2018, p. 14](#)).*

*Negative changes in climate and natural environment require supporting, in areas within the scope of the European Agricultural Policy, measures to control the type and quantity of mineral fertilizers and pesticides used and their deposition in soil, the chemical composition of irrigation water used, including permissible concentration threshold of nitrates, salts, acidic and toxic substances and their impact on the environmental sustainability and quality of the agricultural production, which in turn would favor the reduction of greenhouse emissions.*

*Ensuring a balance of economic activities requires agriculture to become a sector that is attractive to young farmers, which is the basis for preserving and developing local traditions and identity.*

The development of the Common Agricultural Policy (CAP) of the EU after 2014 is mainly expressed in the validation of its structuring in two main pillars, with the aim being to achieve three main common strategic goals - see Figure 2 (Naydenov, 2018, p. 15).



**Figure 2.** General strategic objectives of the common agricultural policy of the European Union for the period 2014-2020

Source: Naydenov, 2018, p. 15

#### 4. FUTURE RESEARCH DIRECTIONS

The development of the Common Agricultural Policy of the EU after 2021 is based on the multiannual financial framework, proposed in May 2018, related to its reformation for the period 2021 - 2027. At the heart of the reform is the model of implementation of the EU Common Agricultural Policy, oriented to results and the principle of subsidiarity, which gives Member States a much greater role in agricultural interventions.

The reform in the agriculture sector stipulates that the Union shall initially determine the key parameters, including the CAP objectives, the principal requirements and the main types of interventions under the first and second pillars, after which the Member States shall elaborate their multiannual Strategic Plans for the agricultural development at the national level.

The future CAP is focused on key objectives reflecting its economic, environmental and socio-territorial multifunctionality. The EU CAP plans to keep both of its pillars as well as the two agriculture-related funds: 1/ the European Agricultural Guarantee Fund, supporting market measures under the first pillar of the EU CAP and 2/ the European Agricultural Fund for Rural Development, supporting activities under the second pillar of the Common Agricultural Policy of the EU (European Parliament, n.d.-c).

For the period 2021-2027, it is also planned that direct payments in support of farms will continue to be priority elements in the new Common Agricultural Policy of the European Union, taking into consideration the restrictions adopted by the European Commission concerning the reduction of payments of over EUR 60,000 and the introduction of a mandatory maximum payment limit of EUR 100,000 per holding.

The new "greening architecture" of the Common Agricultural Policy is envisaged to be much more flexible in terms of its design and management, with its implementation being conferred on to the relevant national authorities. It is envisaged that the implementation of the eco-schemes for the climate and the environment will be financed by EAGF<sup>3</sup> (European Parliament, n.d.-c).

Although the Commission's proposal for reform in the Common Agricultural Policy of the EU concerning the period 2021-2027 brings no change to the mechanisms for funding activities under the second pillar of CAP, the European Agricultural Fund for Rural Development (EAFRD)<sup>4</sup> shall, however, see some changes:

- *The European Agricultural Fund for Rural Development (EAFRD)* is no longer considered to be a structural fund in the general framework of the cohesion policy of the EU Member States;
- *It is envisaged that the activities financed under the second pillar of the EU's Common Agricultural Policy* shall continue to be implemented with a reduced budget, as in the agreement on the multiannual financial framework of July 2020 a 19% reduction in the budgetary costs under the second pillar compared to the previous programming period was sanctioned.
- *The Next Generation EU Fund is expected to increase the budget of EAFRD* by EUR 8 billion to help rural areas make the necessary structural changes to achieve the goals set by the European Green Deal and the digital transition in agricultural practice.

## 5. CONCLUSION

In conclusion, it can be generalized that despite the numerous transformations and reforms, the fundamental objectives of the Common Agricultural Policy of the EU have remained unchanged since its establishment by the Treaty of Rome (1958).

Along with the market and social objectives protecting the interests of both European producers and consumers at the present stage, the objectives of the EU's CAP are complemented by new ones, in support of the traditional function of primary agricultural activity, namely food production, add other dimensions as well, including:

- (1) diversification and viability of local economies, sustainable development and increased quality of life in rural areas;
- (2) restoring, preserving and strengthening ecosystems and mitigating the effects of climate change;
- (3) better connection of EU agriculture with world markets, including improving the compatibility of the EU's Common Agricultural Policy with third-country demand;
- (4) the production of high-value-added foods, increasing the competitive position of European agricultural products, both within the Community and beyond its borders;

<sup>3</sup> *The European Agricultural Guarantee Fund (EAGF)* is a financial instrument from the first Pillar of the Common Agricultural Policy of the EU, from which the costs of organizing the market of agricultural products are financed, including the costs of guarantees and intervention prices, the costs related to import restrictions and external protection, the costs incurred for extraordinary payments based on a certain quality of production, etc.;

<sup>4</sup> *The European Agricultural Fund for Rural Development (EAFRD)* is a financial instrument from the second Pillar of the Common Agricultural Policy of the European Union and one of the European structural and investment funds aimed at strengthening agriculture and forestry and rural areas in general in the EU. EAFRD had a total budget of over EUR 96 billion for the period 2014-2020. This aid is provided for agriculture and forestry, environmental / natural resource management as well as sustainable economic development in rural areas.

- (5) promoting the transfer of knowledge and innovations in agriculture, application of state-of-the-art precise technologies in agricultural production, and sustainable land management;
- (6) providing a better response to the demands of society concerning the quality of agricultural products and public health protection;
- (7) improving the food chain organization, ensuring animal welfare, and achieving risk reduction in agriculture;
- (8) ensuring economic, social and territorial cohesion between the Community's agricultural regions, etc.

## References

- Dimov, A. (2010). *Agricultural Policy*. Plovdiv, Bulgaria. Publisher: Agricultural University of Plovdiv.
- European Parliament. (n.d.-a). The Common Agricultural Policy (CAP) and the Treaty. Factsheets on the European Union. Retrieved April 3, 2023, from <https://www.europarl.europa.eu/factsheets/bg/sheet/103/la-politica-agricola-comun-pac-y-el-tratado>
- European Parliament. (n.d.-b). First pillar of the common agricultural policy: Common organization of the markets (CMO) in agricultural products. Factsheets on the European Union. Retrieved April 4, 2023, from <https://www.europarl.europa.eu/factsheets/en/sheet/108/first-pillar-of-the-cap-i-common-organisation-of-the-markets-cmo-in-agricultural>.
- European Parliament. (n.d.-c). Towards a Post-2020 Common Agricultural Policy. Factsheets on the European Union. Retrieved May 3, 2023, from <https://www.europarl.europa.eu/factsheets/bg/sheet/113/towards-a-post-2020-common-agricultural-policy>
- Naydenov, N. (2018). *Sustainable Rural Development*. Ruse, Bulgaria. Publishing house: Avangard Print.
- Turlakova, T. (2013). *Common Agricultural Policy of the European Union and Its Impact on Agribusiness in Bulgaria*. Varna, Bulgaria. Publishing House: GEA - Print.
- Zagorova, K. (2022). Analysis of the Mechanism of the Common Organization of the Markets for Agricultural Products in the European Union. *International Scientific Conference ERAZ - Knowledge Based Sustainable Development*. <https://doi.org/10.31410/eraz.2022.1>

## Additional reading

- Council of the European Union. (n.d.). Timeline — the history of the CAP. Official website of the Council of the EU and the European Council. Retrieved May 3, 2023, from <https://www.consilium.europa.eu/bg/policies/cap-introduction/timeline-history/>.
- Turlakova, T. & Slavova, G. & Ivanova, P. (2015). *The Impact of the EU's Common Agricultural Policy on Entrepreneurial & Investment Activity in the Agriculture of Rural Areas*. Varna, Bulgaria, Publishing House: GEA - Print.





# The Effectiveness of the Albanian Monetary Policy

Evis Kumi<sup>1</sup> 

Received: June 19, 2023

Accepted: November 13, 2023

Published: March 16, 2024

## Keywords:

Monetary policy;  
Price stability;  
Economic growth;  
Interest rates



Creative Commons Non Commercial CC BY-NC: This article is distributed under the terms of the Creative Commons Attribution-Non-Commercial 4.0 License (<https://creativecommons.org/licenses/by-nc/4.0/>) which permits non-commercial use, reproduction and distribution of the work without further permission.

**Abstract:** *This article aims to assess the efficiency of the Bank of Albania's monetary policy in attaining its goals of price stability and economic expansion. Price stability is essential for ensuring a favorable business environment, preserving the purchasing power of the currency, and reducing uncertainty in the economy. The analysis takes into account the unique characteristics and challenges faced by the Albanian economy. This article offers insights into the effectiveness of the monetary policy framework in Albania by assessing the primary instruments and tactics used by the BoA, including interest rates, reserve requirements, and open market operations. It also investigates how external influences affect the efficacy of monetary policy and makes suggestions for improvement.*

*This paper concludes with suggestions for boosting the Albanian monetary policy's efficacy. It recommends actions to strengthen the transmission mechanism, improve data quality and availability, enhance coordination between monetary and fiscal policies, and boost the institutional capability of the central bank. It also stresses how crucial it is to have a consistent and well-defined policy framework.*

*In the end, this article provides recommendations for enhancing the effectiveness of the Albanian monetary policy. It suggests measures to strengthen the transmission mechanism, improve data quality and availability, enhance coordination between monetary and fiscal policies, and increase the central bank's institutional capacity. Additionally, it emphasizes the importance of maintaining a stable and predictable policy framework.*

## 1. THE GLOBAL FINANCIAL CRISIS AND ALBANIAN ECONOMIC OVERVIEW

The difficult economic conditions and the internal imbalances of the most powerful countries were among the main causes of today's economic crisis and financial catastrophe. Since Italy and Greece, two Eurozone members experiencing severe financial and internal debt crises, are Albania's two most significant trading partners, the consequences of the global financial crisis are indirectly felt in the country's economy.

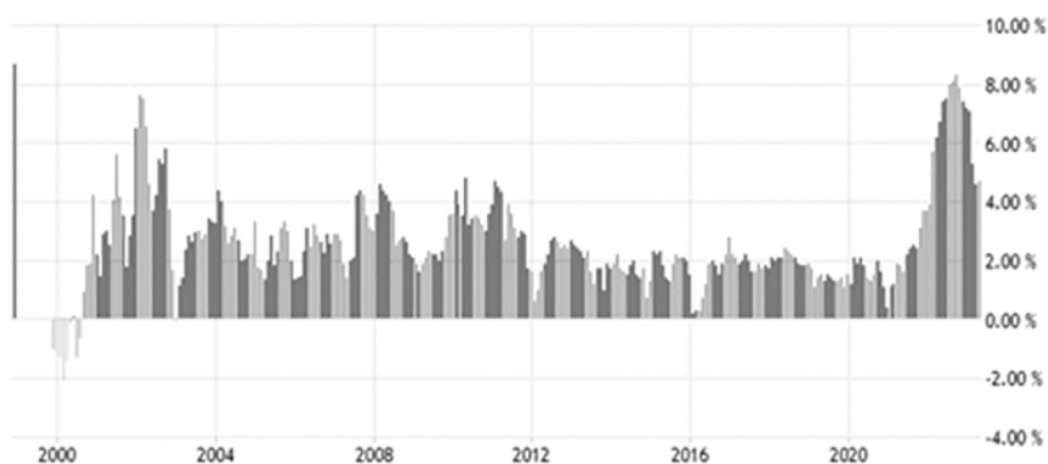
The financial crisis had an impact on the Albanian economy in 2009. Albania's economic development outpaced that of several other Balkan and European nations between 2009 and 2011 as a result of the balanced economy. Due to the rising debt, the fiscal measures adopted by the Albanian government in this situation were unable to achieve their objectives. The Bank of Albania concentrated on prudential policy with the main objective of raising the competitiveness of Albanian goods and services in foreign markets to guarantee economic stability (Shijaku, 2016).

With a growth of 4.8 percent in 2022, the Albanian economy has surpassed forecasts because of robust consumer demand, tourism inflows, and building activity. Along with a rise in the local currency Lek, the fiscal and current account deficits also significantly decreased. Due to sluggish trading partner growth, the removal of policy assistance, and also the tighter financial

<sup>1</sup> Faculty of Economy, Metropolitan University of Tirana, Rruga Sotir Kolea, Tirana, Albania

conditions, the GDP will go toward a falling trend. Although it has been slowly falling, inflation is still beyond the central bank's objective (IMF, 2023).

The latest data indicates that economic growth has recovered rather quickly over the previous year, inflation has kept a cap on its rise, and the major financial and economic balances have remained healthy. One of the lowest inflation rates in the area and Europe, the consumer price index (CPI) inflation dropped in March, marking the lowest level in a year. Due to stabilized prices on the global market and a robust Lek/Euro exchange rate, inflation declined in the first quarter of the year. Inflation was down from the previous quarter's average of 7.9% to an average of 6.5% in the first quarter. Particularly in March, when inflation hit 5.3%, this drop quickened. In terms of the consumer basket, the decline in inflation was a result of lower costs for food and energy, especially for oil. It represented the reduction in imported inflation from a macroeconomic standpoint (Instat, 2023).



**Figure 1.** Inflation rate during the period 2000-2023

Source: Instat, 2023

The rise in household spending, building activity, and the dynamism of the tourist industry all contributed to the 4.8% economic growth for 2022. This success was backed up by the private sector's strong financial position, the labor market's strong performance, and the growth in consumer and business confidence. At the beginning of 2023, indirect data also predicts a rise in demand and output.

The labor market indicates a strong need for workers and pressure to raise pay in the future. This progress may be seen in the unemployment rate dropping to its lowest levels in history, 10.8% at the end of 2022, as well as the quick rise in private sector salaries.

The monetary policy stance has become more normalized as a result of the rise in inflation. The Bank of Albania raised the benchmark interest rate six times since the start of 2022, reaching a high of 3% in March 2023. The domestic financial markets are being affected by the normalization of the monetary policy stance.

The normalization of the monetary policy stance, undertaken through the gradual increases in the key interest rate, has played a decisive role in this positive performance. By setting up the ideal conditions for inflation to return to the goal, prompt monetary policy action was crucial for stabilizing the domestic financial markets and achieving a better balance between the demand and

supply for goods and services. Additionally, the right monetary policy response had no negative effects on the upward tendencies in economic growth. The Albanian economy is still expanding and creating more employment, higher pay, and stable business financial balance sheets. According to this perspective, our monetary policy has contributed to Albania's sustainable and long-term development, which has in turn increased social welfare (Bank of Albania, 2023).



**Figure 2.** Economic growth during period 1991-2022

Source: World Bank Group, 2019

## 2. THE OBJECTIVE OF THE MONETARY POLICY OF THE BANK OF ALBANIA

Annual inflation has been on a downward trend since reaching a peak of 8.3% in October 2022, and it is anticipated to reach 4.6% by the end of 2023 (European Commission, 2023). In order to combat inflationary pressures, the Bank of Albania has increased the key policy interest rate by 250 basis points to 3%. It plans to continue normalizing its monetary policy stance.

Inflation is predicted to attain the 3% objective in 2024 as import costs slow down and local price pressures ease.

The following techniques are used to implement monetary policy: Open market operations, accessible facilities, and operating under the constraints of minimal reserve requirements and freely fluctuating currency rates are all prerequisites.

The M3 monetary aggregate, which is used by the Bank of Albania as a proxy for widespread money, is used to assess the impact of monetary policy on economic inflation. Similar actions are used by the European Central Bank to accomplish the main objective of monetary policy. According to this approach, rising inflation outside of the economy is both a precursor to and an indicator of an increase in the money supply. According to the Bank of Albania, as inflation is a long-term monetary phenomenon, the increase in the amount of money in circulation within the economy has the most effect on it. The fall in mutual funds, the steady long-term expansion of the economy and welfare, as well as the promotion of the financial system's stability all contribute to maintaining price stability, which directly affects maintaining macroeconomic equilibrium in Albania.

From this perspective, the Bank of Albania must keep prices steady at all times, and the best method to achieve this is through utilizing comprehensive economic and financial data. These indicators allow for the early identification of inflationary pressures and the appropriate adjustments to monetary policy.

The examination of economic indicators should be related to indicators of output and the country's financial status and should place a strong emphasis on the short- and long-term inflation processes. This element considers how the interplay between supply and demand in the markets for goods and services affects inflationary pressure.

### **3. FACTORS INFLUENCING MONETARY POLICY EFFECTIVENESS IN ALBANIA**

This section examines many variables, such as inflation rates, the high degree of use of the euro, the timing of political transmission of monetary policy, and the high degree of non-performing loans, to judge the success of the Albanian monetary policy. It looks at how these indicators have performed historically and how they relate to the BoA's policy decisions.

Monetary stability served as one of the main pillars of the Albanian economy's historical economic growth record. It was fairly successful in reducing the minimal volatility of currency rates as shown by inflation. Consumer price inflation decreased from 40% to barely 3% after 1997. The value of the Albanian Lek concerning the euro grew while the exchange rate remained stable. A stable inflation rate and reliable inflation expectations were produced by the soundness of the banking system and the confidence in the monetary policy.

The effectiveness of the monetary policy is directly impacted by the high economic adoption of the euro. Because businesses are more sensitive to exchange rate fluctuations, free exchange rates do not stabilize the economy. Fiscal policy is impacted by the potential price increase in the stock of outstanding debt that is denominated in foreign currencies. In order to limit the frequent use of the euro as a currency and promote the use of local currencies, a deal was made that the Bank of Albania must abide by (Novosz ath, 2023).

The monetary policy will constantly look to the future by estimating the anticipated inflation rate. The transmission mechanism of monetary policy may fluctuate from one year to up to three years depending on important economic operators' expectations regarding interest rates and liquidity. Financial markets, however, do not always respond instantly. This indicates that it may take some time for the impacts of monetary policy operations to be seen inside the economy.

Due to the high percentage of non-performing loans, the banking industry follows a very cautious lending strategy that is based on issues that exist in many economic sectors as well as the practices of other central banks (Balla, 2019).

### **4. FUTURE RESEARCH DIRECTIONS**

There may be other efforts made to tighten inflation targeting. In order to do this, more changes must be made, with a particular emphasis on the following areas:

1. reduce the extent of dollarization;
2. increase financial intermediation levels while taking care to prevent an unsustainable loaning boom;

3. convert the cash-based economy into a bank-based economy;
4. improve the quality of financial institutions (Bolle & Meyer, 2004).

According to empirical evaluations, monetary aggregates should take the lead since they might offer helpful data regarding the long-term impacts of inflation for cross-checking reasons. As a result, there would be considerable changes in how the Bank of Albania approached inflation and the growth of the economy. The biggest challenge will be figuring out how to implement a comprehensive strategy where new and pertinent information is not lost during the decision-making process and where data can be organized so that data necessary for adhering to legal requirements and maintaining price stability can be identified in due time and regularly (Shijaku, 2016).

## 5. CONCLUSION

This paper concludes by summarizing the key findings regarding the effectiveness of the Albanian monetary policy. It highlights the achievements made in maintaining price stability and promoting economic growth. However, it also acknowledges the challenges faced by the BoA and the need for continuous improvement in policy implementation. By adopting the recommended measures, the BoA can further enhance the effectiveness of its monetary policy and contribute to the long-term stability and prosperity of the Albanian economy.

Albania, which had to deal with the bad effects of the earthquake in November 2019 in addition to the epidemic, has found the previous several years to be difficult. Over the past five years, the shock has severely impacted Albanian society and presented difficulties for the country's capacity to maintain its sources of development as well as its economic, monetary, and financial stability. It has demonstrated that preserving economic and financial stability mostly depends on the efforts made by monetary institutions as well as society's capacity to respond to the epidemic promptly and efficiently.

The nation's economic and financial balances have remained sound, economic growth appears stable, and inflation has been falling recently. This development has been positively impacted by the monetary policy normalization thus far, which has contributed to stable financial markets and inflation management. With the way the economy is now operating, inflation is likely to reach its objective by 2024. The normalization of the monetary policy stance may, however, be required to continue in the future due to high aggregate demand and swift wage rise.

Overall, due to persistently strong inflationary pressures, tightening financial conditions, and a slowdown in economic development, the external economic environment for the Albanian economy continues to be a challenge.

Because the issue of crediting domestic firms, particularly SMEs, has not been resolved, there are several dangers associated with financial markets dependent on international banks and foreign currencies. As a result, the country is highly exposed to external hazards and vulnerable to them.

The extent to which Albania's economic and monetary policy will be able to address the ever-evolving issues in the global economy, such as the energy crisis and the price hikes brought on by the Russian-Ukrainian war, is not yet obvious. The major issue is that it is even less clear how Albania will be able to speed up growth, catch up with other EU member states, and close its huge GDP per capita deficit.

## References

- Balla, B. (2019). Albania's Monetary Policy and the Basic Indicators that Effect the Economic Growth. *Journal of International Cooperation and Development*.
- Bank of Albania. (2023). Quarterly Monetary Policy Report, 2023/1. [https://www.bankofalbania.org/rc/doc/RPM\\_2023\\_1\\_ENG\\_23473.pdf](https://www.bankofalbania.org/rc/doc/RPM_2023_1_ENG_23473.pdf)
- Bolle, M., & Meyer, Th. (2004). The effectiveness of monetary policy in Albania and the need for further reform. *Freie Universität Berlin, Jean Monnet Centre of Excellence for European Integration*. [http://www.jmc-berlin.org/new/documents/Albania\\_Bolle\\_Meyer\\_05Oct04.pdf](http://www.jmc-berlin.org/new/documents/Albania_Bolle_Meyer_05Oct04.pdf)
- European Commission. (2023). *European Economic Forecast, spring 2023*. [European Economic Forecast, Spring 2023 \(europa.eu\)](https://ec.europa.eu/economy_finance/economic-forecast-spring-2023)
- IMF. (2023). IMF Staff Completes a Staff Visit to Albania. <https://www.imf.org/en/News/Articles/2023/06/21/pr23222-albania-imf-staff-completes-a-staff-visit-to-albania>
- Instat. (2023). Consumer's Consumption Index, June 2023, Institute of Statistics. <https://www.instat.gov.al/al/temat/%C3%A7mimet/indeksi-i-%C3%A7mimeve-t%C3%AB-konsumit/publikimet/2023/indeksi-i-%C3%A7mimeve-t%C3%AB-konsumit-qershor-2023/>
- Novosz ath, P. (2023). Economic and monetary policy in Albania. *Research gate*. DOI:10.47706/KKIFPR.2022.1.89-124
- Shijaku, G. (2016). The role of money as an important pillar for monetary policy: the case of Albania. *MPRA Paper No. 79088*.
- World Bank Group. (2019). Systematic country diagnosis, 2019 update. Report no. 147451. <https://documents1.worldbank.org/curated/en/822181588712199527/pdf/Albania-Systematic-Country-Diagnostic.pdf>



# The Influence of Economic Activity on Income in the Regions of the Slovak Republic

Mária Vojtková<sup>1</sup> 

Received: August 22, 2023

Accepted: October 30, 2023

Published: March 16, 2024

## Keywords:

Equivalent disposable income;  
Economic activity;  
EU-SILC;  
Analysis of variance



Creative Commons Non Commercial CC BY-NC: This article is distributed under the terms of the Creative Commons Attribution-Non-Commercial 4.0 License (<https://creativecommons.org/licenses/by-nc/4.0/>) which permits non-commercial use, reproduction and distribution of the work without further permission.

**Abstract:** Household income is one of the important components for the quality of life of individuals in the household, while individuals satisfy their needs through it. This paper aims to assess the influence of the selected factor, namely economic activity, the member standing at the head of the household, on the equivalent disposable income of the household in the regions of the Slovak Republic, broken down according to NUTS3, using one-factor analysis of variance. Due to the non-fulfillment of the conditions for the use of parametric variance analysis, its modification using Welch's variance analysis will be used. The starting source of data is data from the EU SILC sample survey on income and living conditions of households in Slovakia for the year 2021, while the analysis itself is carried out using the statistical tool SAS Enterprise Guide 7.1.

## 1. INTRODUCTION

The standard of living of households or populations is characterized by the availability of a variety and quality of goods and services, which is influenced by the household income that the household has at its disposal and uses for purchasing. Household income includes earnings from employment, self-employment, property or land rental, dividends, social benefits, and other income components. On one hand, household income significantly affects wealth, standard of living, and quality of life for households. On the other hand, household income is influenced by various factors such as the economic activity of the population, the financial burden of the population, and the region in which the household is located (Ilavská, 2019).

The main objective of this article is to assess the impact of a selected factor, namely the economic activity of the head of the household, on the equivalent disposable household income in the regions of the Slovak Republic (SR) classified according to NUTS3, using one-way analysis of variance. An additional goal of the article is to conduct a multiple comparison of equivalent disposable household income in various regions of the SR based on the economic activity status of the head of the household.

The analysis itself will be based on data from the EU-SILC (European Union Statistics on Income and Living Conditions) household income and living conditions survey in Slovakia for the year 2021. In processing this data, the statistical tool SAS Enterprise Guide 7.1 will be utilized.

## 2. EU-SILC STATISTICAL SURVEY

EU-SILC can be defined as a statistical sample survey conducted under the guidance of Eurostat, employing precisely defined comparable methodologies and procedures. This survey

<sup>1</sup> University of Economics in Bratislava, Dolnozemska cesta 1, 852 35 Bratislava, Slovak Republic

aims to provide data about households and their incomes, poverty rates among households, social housing and health conditions, as well as many other pieces of information related to the social circumstances of surveyed households' members. It can be considered one of the most widely used sources for analyzing household incomes, with the survey itself being conducted through questionnaires. Its advantage lies in its applicability for comparing the social situations of households across European Union member states. The implementation of this survey in Slovakia is overseen by the Statistical Office of the Slovak Republic and its staff dedicated to statistics of living standards. The survey's data, in addition to income monitoring, serves as a valuable resource for making important decisions in the realm of social policy management and the design of programs to integrate individuals at risk of income poverty and social exclusion (European Commission, 2021).

The analysis of household income will be based on the aforementioned European Union database, EU-SILC, with a focus on the so-called Equivalent Disposable Income (EDI) of households. Equivalent Disposable Income refers to the income of households divided by their corresponding equivalent household size. The calculation of equivalent household size employs an equivalence scale that follows Eurostat's methodology. This scale is also referred to as the OECD modified scale, assigning coefficients to each member of the household as follows: a coefficient of 1 for the first adult household member; 0.5 for the second and each subsequent adult household member; 0.5 for individuals aged 14 and older; and 0.3 for each child younger than 14 years. Subsequently, within the household, each individual is assigned an income (Vlačuha et al., 2022).

A significant factor concerning income measurement is an individual's position in the labor market, as measured through their Economic Activity Status (EAS). In this article, the focus has been placed on the impact of precisely this selected factor from the EU-SILC database, where the economic activity status of the head of selected households undergoes the following variations (Hurbánková & Sivašová, 2018):

- Employed - individuals who are older than 15 years and engage in economic activity for at least 1 hour during the observed period, receiving income such as wages, salary, or profit from entrepreneurial activities.
- Unemployed - residents aged 15 and older who are without work at the moment of decision and are actively seeking employment, regardless of whether they are registered as job seekers.
- Retirees - residents who receive old-age, early retirement, disability, or service pensions, and the pension is their sole source of income.
- Other inactive individuals - individuals not classified in the previous groups constitute the economically inactive population.

The reason for selecting this factor is a plethora of studies and articles that anticipate its significant influence (Blank et al., 1993; Šoltés, 2018; Košíková & Šoltés, 2020; Želinský et al., 2021). Most of the mentioned studies focus on observing this factor concerning indicators of poverty.

The impact of economic activity on equivalent disposable income in the regions of the Slovak Republic, categorized according to NUTS 3, was examined: Bratislava Region (BA), Trnava Region (TT), Trenčín Region (TN), Nitra Region (NR), Žilina Region (ZA), Banská Bystrica Region (BB), Prešov Region (PO), and Košice Region (KE) (Eurostat, 2022).



### 3. RESULTS AND DISCUSSION

#### 3.1. Analysis of the Dependence of the Equivalent Disposable Income of Households on the Selected Factor

To assess the impact of the selected factor, namely the economic activity of the head of the household, on equivalent disposable income, a decision has been made to employ a one-way analysis of variance. The essence of the analysis of variance is to determine whether statistically significant differences exist among the average values of the dependent variable (EDI) for various levels (or categories, groups) of the independent variable (EAS). The name “analysis of variance” is derived from the fact that judgments about means at different levels of the factor are made by comparing the variability between groups and the variability within these groups.

First, we focus on meeting the assumptions of the one-way analysis of variance: independence, normality, and homoscedasticity of equivalent disposable income (EDI) for different levels of the economic activity factor in all regions of the Slovak Republic.

The condition of independence is ensured by the precisely defined methodology of the statistical survey. In the EU-SILC 2021 survey, a two-stage stratified sampling was used, with a proportional number of households selected by simple random sampling in each stratum (Vlačuha et al., 2022). Given a sufficiently large sample of households in each region, we can also assume that the normality condition for EDI at different levels of EAS is met based on the validity of the central limit theorem. To verify the condition of homoscedasticity, i.e., equality of variances of EDI for different levels of the factor, Levene’s test of homoscedasticity was used. The results of the homoscedasticity test for individual regions of the Slovak Republic are presented in Table 1. Since the  $p$ -values in all regions are lower than our chosen significance level of 0.05, we reject the null hypothesis of equal variances. Due to the violation of the homoscedasticity assumption, it is decided to assess the impact of the economic activity status of household heads on equivalent disposable income using a more suitable Welch’s one-way analysis of variance instead of the parametric analysis of variance.

**Table 1.** Levene’s test for the presence of homoscedasticity

Region	Source	DF	F Value	Pr > F
BA	EAS	3	6.47	0.0002
	Error	904		
TT	EAS	3	6.36	0.0003
	Error	612		
TN	EAS	3	2.77	0.0412
	Error	516		
NR	EAS	3	4.79	0.0027
	Error	543		
ZA	EAS	3	3.70	0.0118
	Error	538		
BB	EAS	3	4.37	0.0047
	Error	555		
PO	EAS	3	5.51	0.0010
	Error	546		
KE	EAS	3	3.64	0.0126
	Error	664		

Source: EU SILC, 2021; own processing in the SAS Enterprise Guide

Welch’s one-way analysis of variance (Delacre et al., 2019; Liu, 2015) reduces the impact of heteroscedasticity in EDI across different levels of the factor. Its application in the context of the Bratislava Region will be illustrated. The primary goal of Welch’s one-way analysis of variance is to test both the null and alternative hypotheses, with their formulations as follows:

$$H_0: \mu_1 = \mu_2 = \dots = \mu_k$$

$H_1$ : The mean differs at least at two-factor levels

where  $\mu_i$  is the mean value for the  $i$ -th level of the factor,  $i = 1, 2, \dots, k$ , and  $k$  is the number of variations of the factor.

As the value of the test statistic is 52.41 and the  $p$ -value is less than the significance level of 0.05, we reject the null hypothesis of equality of means of EDI across different levels of EAS (Table 2). The economic activity status factor has a significant impact on the variable equivalent disposable income in the Bratislava Region. It explains 13.26% of the variability in the dependent variable equivalent disposable income in the Bratislava Region, which is a common result when working with larger datasets. However, this does not imply that the estimated model is of low quality (Table 3). The remaining 86.74% of variability is explained by other measurable or unmeasurable factors not considered in our model.

**Table 2.** Analysis of the impact of the EAS of the member standing at the head of the household on the EDI in the Bratislava Region

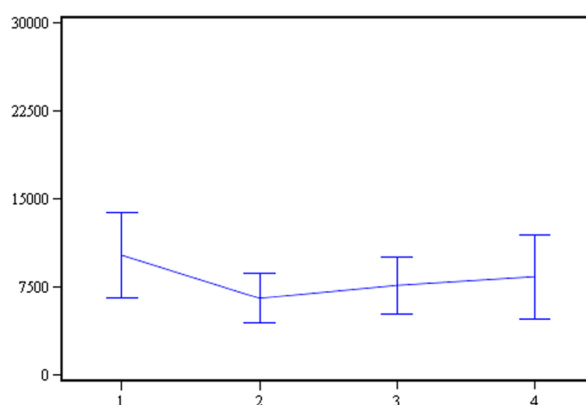
Welch's ANOVA for EDI			
Source	DF	F Value	Pr > F
EAS	3.0000	52.41	<.0001
Error	59.4101		

Source: EU SILC, 2021; own processing in the SAS Enterprise Guide

**Table 3.** Descriptive statistics of EDI depending on the EAS factor in the Bratislava region

R-Square	Coeff Var	Root MSE	EDP Mean
0.132652	35.57557	3223.005	9059.603

Source: EU SILC, 2021; own processing in the SAS Enterprise Guide



**Figure 1.** Mean values of EDI for individual levels of the EAS factor of the head of household in the Bratislava Region

Source: EU SILC, 2021; own processing in the SAS Enterprise Guide

The result of the  $F$ -test using Welch’s analysis of variance confirmed the inequality of means of EDI for different levels of EAS, and this finding is also supported by graphical analysis (Figure 1). In the Bratislava Region, households, where the head’s economic activity status is “employed” (1), have the highest mean EDI value among all household types.

The assessment of the impact of economic activity on equivalent disposable income in other regions of the Slovak Republic using Welch’s analysis of variance is presented in Table 4. In this case, as well, the low  $p$ -value in all regions confirms that the economic activity status of

household heads significantly influences the EDI of selected households in all regions of Slovakia. The economic activity factor of household heads has the greatest explanatory power on the variability of EDI in the Košice Region (22.14%) and the least in the Trenčín Region (16.69%).

**Table 4.** Verification of the impact of the EAS of the member at the head of the household on EDI in other regions of the Slovak Republic

Welch's ANOVA for EDI				
Region	DF	F Value	Pr > F	R-Square
TT	3.0000	16.12	<.0001	0.180735
TN	3.0000	17.33	0.0003	0.114036
NR	3.0000	17.74	<.0001	0.166949
ZA	3.0000	15.16	<.0001	0.190447
BB	3.0000	22.12	<.0001	0.122551
PO	3.0000	34.35	<.0001	0.128952
KE	3.0000	57.93	<.0001	0.221413

Source: EU SILC, 2021; own processing in the SAS Enterprise Guide

### 3.2. Multiple Comparisons of the Means of Regional Equivalent Disposable Income at Different Levels of the Economic Activity Status of the Household Head

From the previous analysis, it is evident that the economic activity factor of the household head has an impact on household EDI. To determine the differences between the levels of mean equivalent disposable income influenced by the economic activity factor, we will employ multiple comparisons using the Bonferroni test (Armstrong, 2014).

Multiple comparisons of the levels of economic activity within the Bratislava Region at a significance level of  $\alpha = 0.05$  are presented in Table 5. Statistically significant differences in the mean equivalent disposable incomes in the Bratislava Region for the year 2021 were observed in the following combinations of economic activity levels of the household head: employed and other inactive person, employed and retiree, and employed and unemployed. In all combinations, based on the Bonferroni test, the positive difference value is observed for the “employed” level compared to the other levels of EAS. The largest difference in equivalent disposable income is seen in the combination of “employed” and “unemployed” levels, with a difference of €3,654.5.

The comparison of mean equivalent disposable incomes across levels of economic activity for the household head in other regions is provided in Table 6. At a significance level of 0.05, for the combinations of “employed” - “other inactive person,” “employed” - “retiree,” and “employed” - “unemployed,” there are statistically significant differences in equivalent disposable incomes of households in all regions. The exception is the Trnava Region, where the average equivalent disposable incomes of households are the same for the combination of “employed” and “other inactive person”. Based on the Bonferroni test, for all these pairs, the “employed” category has a positive difference compared to the other category of the EAS factor.

Aside from the Trenčín and Nitra regions, statistically significant differences can be confirmed in combinations of economic activity categories for the household head, specifically “retiree” and “unemployed,” and “other inactive person” and “unemployed.” In these combinations, the “retiree” and “other inactive person” categories exhibit a positive difference compared to

the “unemployed” category. In the Košice Region, the only region in Slovakia where all combinations of the examined levels are statistically significant, equivalent disposable incomes of households show statistically significant differences. Conversely, the combination of “retiree” and “other inactive person” yields statistically insignificant differences in nearly all regions.

**Table 5.** Multiple comparisons of equivalent disposable income at levels of economic activity status in the Bratislava region

Comparisons significant at the 0.05 level are indicated by ***.				
EAS Comparison	Difference Between Means	Simultaneous 95% Confidence Limits		
employed - other inactive person	1811.1	628.1	2994.1	***
employed - retiree	2544.4	1944.7	3144.1	***
employed - unemployed	3654.5	1420.9	5888.1	***
other inactive person - employed	-1811.1	-2994.1	-628.1	***
other inactive person- retiree	733.3	-476.8	1943.4	
other inactive person- unemployed	1843.4	-625.1	4311.9	
retiree - employed	-2544.4	-3144.1	-1944.7	***
pensioner - other inactive person	-733.3	-1943.4	476.8	
retiree - unemployed	1110.1	-1138.0	3358.2	
unemployed - employed	-3654.5	-5888.1	-1420.9	***
unemployed - other inactive person	-1843.4	-4311.9	625.1	
unemployed - retiree	-1110.1	-3358.2	1138.0	

Source: EU SILC, 2021; own processing in the SAS Enterprise Guide

**Table 6.** Multiple comparisons of equivalent disposable income at levels of economic activity status in other regions

EAS	TT	TN	NR	ZA	BB	PO	KE
1-2	4222.7***	4843.2***	2932.1***	4197.3***	5182.0***	4435.6***	4964.4***
1-3	1050.6	1406.2***	1179.9***	1136.4***	1377.6***	1083.0***	1669.4***
1-4	1490.7***	1870.0***	1358.2***	1362.5***	1942.9***	2154.0***	3415.5***
2-1	-4222.7***	-4843.2***	-2932.1***	-4197.3***	-5182.0***	-4435.6***	-4964.4***
2-3	-3172.1***	-3436.9	-1752.2	-3060.9***	-3804.4***	-3352.6***	-3295.1***
2-4	-2732.0***	-2973.2	-1573.9	-2834.8***	-3239.1***	-2281.7***	-1548.9***
3-1	-1050.6	-1406.2***	-1179.9***	-1136.4***	-1377.6***	-1083.0***	-1669.4***
3-2	3172.1***	3436.9	1752.2	3060.9***	3804.4***	3352.6***	3295.1***
3-4	440.1	463.7	178.3	226.1	565.3	1071.0	1746.1***
4-1	-1490.7***	-1870.0***	-1358.2***	-1362.5***	-1942.9***	-2154.0***	-3415.5***
4-2	2732.0***	2973.2	1573.9	2834.8***	3239.1***	2281.7***	1548.9***
4-3	-440.1	-463.7	-178.3	-226.1	-565.3	-1071.0	-1746.1***

Explanations: 1- employed, 2- unemployed, 3- retiree, 4- other inactive person

Source: EU SILC, 2021; own processing in the SAS Enterprise Guide

#### 4. CONCLUSION

The obtained results confirmed that the impact of the selected factor, the economic activity status of the household head, on the equivalent disposable income of households in the Slovak regions, is statistically significant. The average equivalent disposable income of the selected households in Slovakia for the year 2021 was €8,711.70.

Additional results from the multiple comparisons of mean equivalent disposable incomes in different regions further confirmed that households with an “employed” household head achieved the highest average equivalent disposable incomes in each analyzed region in Slovakia. On



the other hand, households with an “unemployed” household head attained the lowest average equivalent incomes. Based on the *R*-Square indicator, we can conclude that the selected factor explains the variability of the dependent variable (EDI) in each region by more than 10%, confirming its significance. The economic activity status’s impact on equivalent disposable income was only statistically significant in the Košice Region across all categories.

From a methodological perspective, the presented paper offers an alternative for assessing the impact of an independent variable on a dependent variable when the assumption of equal variances in individual categories of the independent variable is not met. This is achieved through the utilization of Welch’s one-way analysis of variance.

### Acknowledgment

This research was supported by the Grant Agency of the Slovak Republic [VEGA grant number 1/0561/21 The impact of the COVID-19 crisis on business demography and employment in the Slovak Republic and the EU].

### References

- Armstrong, R. A. (2014). *When to use the Bonferroni correction*. *Ophthalmic and Physiological Optics*, 34(5), 502-508.
- Blank, R. M., Card, D., Levy, F., & Medoff, J. L. (1993). Poverty, income distribution, and growth: Are they still connected? *Brookings Papers on Economic Activity*, 1993(2), 285-339.
- Delacre, M., Leys, C., Mora, Y. L., & Lakens, D. (2019). Taking parametric assumptions seriously: Arguments for the use of Welch’s F-test instead of the classical F-test in one-way ANOVA. *International Review of Social Psychology*, 32(1), 13.
- European Commission. (2021). *Methodological guidelines and description of EU-SILC target variables*. Luxembourg: Publications Office of the European Union. Retrieved from: [https://ec.europa.eu/eurostat/documents/203647/16195750/2021\\_Doc65\\_EUSILC\\_User\\_Guide.pdf](https://ec.europa.eu/eurostat/documents/203647/16195750/2021_Doc65_EUSILC_User_Guide.pdf)
- Eurostat. (2022). *Statistical regions in the European Union and partner countries NUTS and statistical regions 2021*. Luxembourg: Publications Office of the European Union.
- Hurbánková, E., & Sivašová, D. (2018). *Hospodárska štatistika I*. Bratislava: Ekonóm.
- Ilavská, K. (2019). Family incomes and their quality of life: Kvalita života závislá od príjmov rodiny. *Pedagogické diskusie* 3/2019, 49-72.
- Košíková, M., & Šoltés, E. (2020). Analýza ekvivalentného disponibilného príjmu slovenských domácností s využitím príkazov CONTRAST a LSMEANS v procedúre GLM. *Economics And Informatics*, 18(2).
- Liu, H. (2015). *Comparing Welch ANOVA, a Kruskal-Wallis test, and traditional ANOVA in case of heterogeneity of variance*. Virginia Commonwealth University.
- Šoltés, E. (2018). *Chudoba a sociálne vylúčenie v EÚ a v SR: v kontexte stratégie Európa 2020*. Univerzita Pardubice.
- Vlačuha, R., Kováčová, Y., & Kubala, M. (2022). *EU SILC 2021 Indikátory chudoby a sociálneho vylúčenia*. Bratislava: Štatistický úrad SR.
- Želinský, T., Mysíková, M., & Garner, T. I. (2021). Trends in subjective income poverty rates in the European Union. *The European Journal of Development Research*, 1-24.





# Trend Analysis of the Employment Rate in Slovakia Regions in the Period 2013–2022

Ľubica Hurbánková<sup>1</sup> 

Received: August 19, 2023  
Accepted: October 30, 2023  
Published: March 16, 2024

## Keywords:

The employment rate;  
Slovakia regions



Creative Commons Non Commercial CC BY-NC: This article is distributed under the terms of the Creative Commons Attribution-NonCommercial 4.0 License (<https://creativecommons.org/licenses/by-nc/4.0/>) which permits non-commercial use, reproduction and distribution of the work without further permission.

**Abstract:** *The paper deals with the analysis of the employment rate. The author analyses this indicator in Slovakia regions using the data in the period 2013 – 2022. The analysis of the trend uses relative characteristics of time series analysis – growth rate, and average growth rate. The purpose of the paper is to find out the uniformity, respectively variability of growth rate using absolute geometric deviation and average absolute geometric deviation. The author quantifies absolute changes, relative changes and parallel absolute and relative changes by difference rate.*

*The employment rate in the Košice region increased the most in 2022 compared to 2021 by 5.78%. The trend was the most uniform in Bratislava and Prešov regions. When comparing the years 2022 and 2013 using the difference rate, the employment rate in the Žilina region increased the most, absolutely by 15.3 percentage points, relatively by 26.24%, in the case of a combined comparison by 3.5656.*

## 1. INTRODUCTION

The employment rate is one of the basic indicators of labor force statistics. There are several types of employment rates – the employment rate of the population over 15 years of age, the employment rate of the population in productive age, and the employment rate of the population aged 20 – 64.

In the paper, the decision was made to analyze the indicator of the employment rate of the population in productive age, which is calculated as a ratio of the number of employed persons in the age of 15 – 64 to the number of working populations (people in productive age).

Employees in the labor force survey are persons aged 15 and over who work for a public or private employer and who receive compensations in the form of wage or salary, including persons working abroad for up to 1 year and persons commuting to work abroad, persons performing work based on agreements and persons on paid activation work. It can be a full-time or part-time job, permanent, temporary, casual, or seasonal. Helping members of entrepreneurs' households are also included among the employees, who do not receive any salary for their activity. Persons who have a job, but do not work in the observed week due to illness, vacation, regular maternity leave, training, or bad weather, as a result of a strike or lockout, are also considered employees, except for persons on long-term unpaid leave and persons on parental leave (Statistical Office of the Slovak Republic, 2022).

Employment rates are sensitive to the economic cycle, but in the longer term, they are significantly affected by the government's higher education and income support policies and by policies that facilitate the employment of women and disadvantaged groups (OECD, 2023).

<sup>1</sup> University of Economics in Bratislava, Dolnozemska cesta 1, 852 35 Bratislava, Slovak Republic

## 2. METHODOLOGY

The employment rate will be analyzed using the relative characteristics of time series analysis, specifically the growth rate and average growth rate. It is necessary to analyze the stability, uniformity, or variability of growth rates. Appropriate descriptive characteristics are rates of variability – absolute geometric deviation, and average absolute geometric deviation.

- **Absolute geometric deviation ( $d_G^i$ )** – compares the trend in two consecutive periods  $t$  and  $t-1$  to the average trend for the entire time series – to the average growth rate. For the  $i$ -th component of the aggregate indicator, the absolute geometric deviation is the ratio of the growth rate and the average growth rate, while the exponent is the ratio of the difference between the growth rate and the average growth rate on its absolute value (Seger et al., 1998):

$$d_G^i = \left(\frac{k_t}{\bar{k}}\right)^{\left(\frac{k_t - \bar{k}}{|k_t - \bar{k}|}\right)} \quad (1)$$

where:

$i=1,2,\dots,n$  are components of the aggregate indicator,  
 $k_t$  is the growth rate (Kotlebová & Komara, 2022):

$$k_t = \frac{y_t}{y_{t-1}} \text{ for } t = 2, 3, \dots, T \quad (2)$$

$\bar{k}$  is the average growth rate (Kotlebová & Komara, 2022):

$$\bar{k} = \sqrt[T-1]{k_2 \cdot k_3 \cdot \dots \cdot k_T} = \sqrt[T-1]{\frac{y_T}{y_1}} \quad (3)$$

$T$  is the length of the time series (the number of data),  
 $y_1$  is the value of the indicator in the first period,  
 $y_T$  is the value of the indicator in the last period.

The average growth rate shows an average value for the rate of change over a period of time (typically several years). This rate facilitates comparisons of rates of change for periods of different lengths, for example, comparing annual rates of change (Eurostat, 2023b).

The exponent of absolute geometric deviation can take either the value (+1) or (-1). If  $k_t > \bar{k}_t \rightarrow$  exponent = + 1, the absolute geometric deviation expresses how many times faster the analyzed indicator developed in the period  $t/t-1$  than its average growth. Thus, this period  $t/t-1$  accelerates the growth of the indicator with the size of the deviation, which is equal to the value of the absolute geometric deviation. If  $k_t < \bar{k}_t \rightarrow$  exponent = - 1, the absolute geometric deviation expresses how many times faster the average growth was than the increase in trend in the period  $t/t-1$ . This period slows the trend of the indicator.

The absolute geometric deviation expresses how many percentage points the increase (decrease) between the period ( $t$ ) and ( $t-1$ ) contributed to the average increase (decrease) by one percentage point in the entire observed period. Low deviations from the average growth rate mean a steady trend of the indicator. When evaluating the trend of a certain indicator in the entire time series, it is possible to find out the periods in which the indicator deviated the most from the average trend and focus a more detailed analysis on these periods.



- **Average absolute geometric deviation ( $\overline{d}_G$ )** – it is calculated as the geometric mean from the absolute geometric deviations (Hindls et al., 2018):

$$\overline{d}_G = \sqrt[n]{\prod_{i=1}^n d_G^i} = \sqrt[n]{\prod_{i=1}^n \left(\frac{k_t}{k_{t-1}}\right)^{\left(\frac{k_t - k_{t-1}}{|k_t - k_{t-1}|}\right)}} \quad (4)$$

The larger the average absolute geometric deviation, the more significant fluctuations existed compared to the average trend in individual periods.

Simultaneous absolute and relative changes will be quantified using **the difference rate**. This rate is a combination of absolute and relative comparison. We calculate it based on the formula (Hindls et al., 2000):

$$R(y) = \left(\frac{y_k}{y_j}\right)^{(y_k - y_j)} \quad (5)$$

whereas:

$$\left(\frac{y_k}{y_j}\right) = I(y) \quad (6)$$

$$(y_k - y_j) = d(y) \quad (7)$$

where:

$k$  is the compared situation of variable  $y$  (most often it is the value of  $y$  in period  $t$ ),  
 $j$  is the basis for comparing the variable  $y$  (most often it is the value of  $y$  in the period  $(t-1)$  or  $0$ ).

For practical applications, the logarithmic form is used because  $R(y)$  can take on astronomical values (Hurbánková & Sivašová, 2018):

$$\ln R(y) = d(y) \cdot \ln I(y) \quad (8)$$

where:

$d(y)$  is the absolute change of the analyzed indicator  $y$ ,  
 $I(y)$  is the relative change of the analyzed indicator  $y$ .

These rates will be applied to the data on the employment rate of the population in productive age in the regions of Slovakia.

### 3. RESULTS AND DISCUSSION

Data for the analysis of the employment rate in the regions of Slovakia were obtained from the website of the Statistical Office of the Slovak Republic for the years 2013 – 2022. They are listed in Table 1.

From Table 1, we can see that the ratio of employees in productive age and the number of populations in productive age in Slovakia varied from 59.9% to 71.3% during the entire monitored period. The analyzed indicator was higher than the national average in Bratislava, Trnava, Trenčín and Nitra regions.

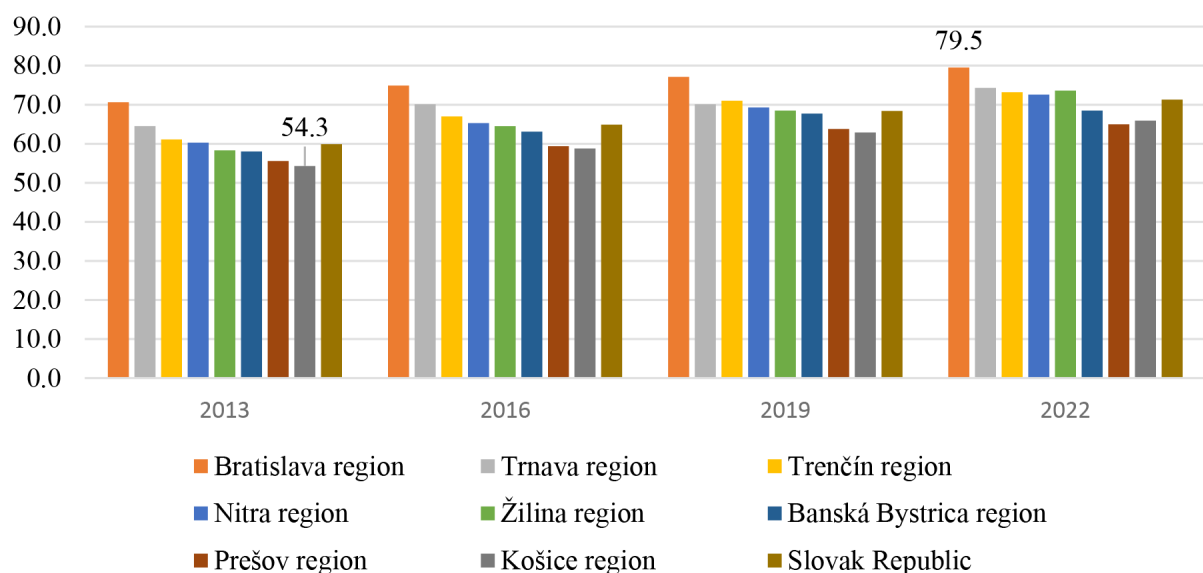
The rate of employment in the Slovak Republic is comparable to that of developed EU countries significantly lower (EU-27 at the level of 74.6% in 2022) (Eurostat, 2023a). Quite high there are also disproportions between the Bratislava region (79.5%) and three least developed regions (Prešov, Košice, Banská Bystrica 65.0 – 68.5%). This regional difference is observed within the entire observed period.

**Table 1.** The employment rate in % in Slovakia regions in the period 2013 – 2022

Region	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Bratislava	70,6	70,9	71,5	74,9	75,2	76,2	77,1	75,4	78,5	79,5
Trnava	64,5	64,7	67,0	70,1	70,1	68,8	70,1	70,3	72,7	74,3
Trenčín	61,1	63,1	64,4	67,0	69,3	71,0	71,0	70,3	72,8	73,2
Nitra	60,3	62,1	63,0	65,3	67,5	68,6	69,3	68,5	72,3	72,6
Žilina	58,3	59,0	62,4	64,5	65,7	67,2	68,5	67,5	70,9	73,6
Banská Bystrica	58,0	58,6	61,8	63,1	64,5	66,5	67,7	67,4	66,2	68,5
Prešov	55,6	56,5	57,1	59,4	61,2	63,1	63,8	62,0	63,4	65,0
Košice	54,3	56,4	58,2	58,8	59,8	62,3	62,9	62,1	62,3	65,9
Slovak Republic	59,9	61,0	62,7	64,9	66,2	67,6	68,4	67,5	69,4	71,3

Source: Statistical Office of the Slovak Republic, 2023.

The highest values of the employment rate were recorded in Bratislava region during the entire monitored period (the highest value was recorded in 2012 – 79.5%), and the lowest in Prešov and Košice regions (the lowest value was in 2013 in Košice region – 54.3%). We can also see this in Figure 1.



**Figure 1.** The employment rate in % in Slovakia regions in the years 2013, 2016, 2019 and 2022

Source: Own processing

Table 2 shows the calculated growth rates and average growth rates, which we will use when calculating the absolute geometric deviation and the average absolute geometric deviation.

Based on the data in Table 2, we can state that during the entire monitored period, the employment rate in the Košice region increased the most in 2022 compared to 2021 by 5.78%. It decreased in almost all regions in 2020 compared to 2019 (except for the Trnava region), the most

in Prešov region by 2.82%. It was caused by the COVID-19 pandemic. Analyzed indicators for the Slovak Republic recorded the highest increase in 2016 compared to 2015 – by 3.51%, the decrease was found only when comparing the years 2020 and 2019 – a decrease of 1.32%. On average, the lowest annual increase was recorded in the Bratislava region, by 1.19%, and the highest in Žilina region by 2.36%. The average annual employment rate in Slovakia grew by 1.95%.

**Table 2.** Growth rates and average growth rates of the employment rate in Slovakia regions in the period 2014 – 2022

Region	2014/2013	2015/2014	2016/2015	2017/2016	2018/2017
Bratislava	1,0042	1,0085	1,0476	1,0040	1,0133
Trnava	1,0031	1,0355	1,0463	1,0000	0,9815
Trenčín	1,0327	1,0206	1,0404	1,0343	1,0245
Nitra	1,0299	1,0145	1,0365	1,0337	1,0163
Žilina	1,0120	1,0576	1,0337	1,0186	1,0228
Banská Bystrica	1,0103	1,0546	1,0210	1,0222	1,0310
Prešov	1,0162	1,0106	1,0403	1,0303	1,0310
Košice	1,0387	1,0319	1,0103	1,0170	1,0418
Slovak Republic	1,0184	1,0279	1,0351	1,0200	1,0211

Source: Own calculations

**Continuation of the table 2**

Region	2019/2018	2020/2019	2021/2020	2022/2021	Average
Bratislava	1,0118	0,9780	1,0411	1,0127	1,0119
Trnava	1,0189	1,0029	1,0341	1,0220	1,0142
Trenčín	1,0000	0,9901	1,0356	1,0055	1,0182
Nitra	1,0102	0,9885	1,0555	1,0041	1,0187
Žilina	1,0193	0,9854	1,0504	1,0381	1,0236
Banská Bystrica	1,0180	0,9956	0,9822	1,0347	1,0168
Prešov	1,0111	0,9718	1,0226	1,0252	1,0157
Košice	1,0096	0,9873	1,0032	1,0578	1,0196
Slovak Republic	1,0118	0,9868	1,0281	1,0274	1,0195

Source: Own calculations

The highest fluctuations compared to the average trend occurred in the Košice region by 1.80 percentage points, on the contrary, the smallest in Bratislava and Prešov regions, by 1.35 percentage points, where the development was the most uniform. Average deviations of 0.92 percentage points were found for the entire Slovak Republic (see Table 3).

The difference rate will be applied to the most recent period and the oldest period. It will be used to compare the employment rate in 2022 versus 2013 in terms of absolute, relative, and combined absolute and relative comparison.

Based on the difference rate calculated in Table 4, it can be stated that in 2022, compared to 2013, the employment rate increased the most in the Žilina region, absolutely by 15.3 percentage points, relatively by 26.24%, in the case of a combined comparison by 3.5656. The analyzed indicator grew the least in the Bratislava region, absolutely by 8.9 percentage points, relatively by 12.61%, and by a combination of absolute and relative comparison by 1.0567. In the Slovak Republic, the share of employees in productive age and the number of populations in productive age increased absolutely in 2022 compared to 2013, absolutely by 11.4 percentage points, relatively by 19.03%, and using the combined comparison, it was an increase by 1.9861.

**Table 3.** Absolute geometric deviations and average absolute geometric deviations of the employment rate in Slovakia regions in the period 2014 – 2022

Region	2014/2013	2015/2014	2016/2015	2017/2016	2018/2017
Bratislava	1,0090	1,0048	1,0338	1,0092	1,0000
Trnava	1,0127	1,0194	1,0300	1,0158	1,0350
Trenčín	1,0122	1,0003	1,0197	1,0138	1,0042
Nitra	1,0088	1,0063	1,0153	1,0126	1,0045
Žilina	1,0141	1,0306	1,0072	1,0075	1,0033
Banská Bystrica	1,0082	1,0353	1,0023	1,0035	1,0121
Prešov	1,0013	1,0068	1,0224	1,0126	1,0133
Košice	1,0166	1,0100	1,0113	1,0047	1,0196
Slovak Republic	1,0012	1,0082	1,0152	1,0005	1,0016

Source: Own calculations according to (1)

Continuation of the table 3

Region	2019/2018	2020/2019	2021/2020	2022/2021	Average
Bratislava	1,0015	1,0361	1,0275	1,0005	1,0135
Trnava	1,0030	1,0130	1,0180	1,0061	1,0170
Trenčín	1,0203	1,0304	1,0150	1,0147	1,0145
Nitra	1,0105	1,0328	1,0339	1,0166	1,0157
Žilina	1,0068	1,0414	1,0235	1,0115	1,0161
Banská Bystrica	1,0006	1,0232	1,0371	1,0158	1,0153
Prešov	1,0063	1,0470	1,0050	1,0076	1,0135
Košice	1,0120	1,0349	1,0185	1,0353	1,0180
Slovak Republic	1,0076	1,0331	1,0084	1,0077	1,0092

Source: Own calculations according to (1), (4)

**Table 4.** Difference rate of the employment rate in Slovakia regions in the year 2022 compared to 2013

Region	$d(y)$	$I(y)$	$lnR(y)$
Bratislava	8,9	1,1261	1,0567
Trnava	9,8	1,1519	1,3862
Trenčín	12,1	1,1980	2,1863
Nitra	12,3	1,2040	2,2833
Žilina	15,3	1,2624	3,5656
Banská Bystrica	10,5	1,1810	1,7471
Prešov	9,4	1,1691	1,4683
Košice	11,6	1,2136	2,2459
Slovak Republic	11,4	1,1903	1,9861

Source: Own calculations according to (8)

#### 4. FUTURE RESEARCH DIRECTIONS

The current results may form a basis for further research realized on data for districts of Slovakia.

#### 5. CONCLUSION

Based on the analysis of the employment rate of the population in productive age, we came to the following conclusions:

- over the entire monitored period, the employment rate in the Košice region increased the most in 2022 compared to 2021 by 5.78%;



- the highest decrease of the analyzed indicator was recorded in the Prešov region in 2020 compared to 2019 when the employment rate decreased by 2.82%;
- on average, the indicator grew the most in Žilina region by 2.36% and the least in Bratislava region by 1.19%;
- the highest deviations compared to the average growth rate occurred in Košice region by 1.80 percentage points, the lowest in Bratislava and Prešov regions, by 1.35 percentage points;
- when comparing the years 2022 and 2013 using the difference rate, the employment rate in the Žilina region increased the most, absolutely by 15.3 percentage points, relatively by 26.24%, in the case of a combined comparison by 3.5656;
- the analyzed indicator grew the least in 2022 compared to 2013 in the Bratislava region, by 8.9 percentage points, relatively by 12.61%, and a combination of absolute and relative comparison by 1.0567.

### Acknowledgment

This research was supported by the Grant Agency of the Slovak Republic [VEGA grant number 1/0561/21 The impact of the COVID-19 crisis on business demography and employment in the Slovak Republic and the EU].

### References

- Eurostat. (2023a). Retrieved from: [https://ec.europa.eu/eurostat/databrowser/view/LFSI\\_EMP\\_A/default/table?lang=en](https://ec.europa.eu/eurostat/databrowser/view/LFSI_EMP_A/default/table?lang=en)
- Eurostat. (2023b). Retrieved from: [https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Glossary:Annual\\_average\\_growth\\_rate\\_\(AAGR\)](https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Glossary:Annual_average_growth_rate_(AAGR))
- Hindls, R., Arltová, M., & Hronová, S. (2018). *Statistika v ekonomii*. Průhonice: Professional Publishing.
- Hindls, R., Hronová, S., & Novák, I. (2000). *Metody statistické analýzy pro ekonomy*. Praha: Management Press.
- Hurbánková, L., & Sivašová, D. (2018). *Hospodárska štatistika I*. Bratislava: Vydavateľstvo EKONÓM.
- Kotlebová, E., & Komara, S. (2022). *Vybrané kapitoly zo štatistiky*. Bratislava: Letra Edu.
- OECD. (2023). Retrieved from: <https://data.oecd.org/emp/employment-rate.htm>
- Seger, J., Hindls, R. & Hronová, S. (1998). *Statistika v hospodárství*. Praha: ETC Publishing.
- Statistical Office of the Slovak Republic. (2022). *Statistical Yearbook of the Slovak Republic 2021*. Bratislava: VEDA.
- Statistical Office of the Slovak Republic. (2023). Retrieved from: [www.statistics.sk](http://www.statistics.sk)





# The Qualification and Educational Level of Workforce as Employment Factor: Case Study in Nitra Region of Slovakia

Dana Országhová<sup>1</sup>   
Martina Chlebcová<sup>2</sup> 

Received: July 24, 2023  
Accepted: October 30, 2023  
Published: March 16, 2024

## Keywords:

Workforce;  
Labour market;  
Region;  
District;  
Employment;  
Educational structure



Creative Commons Non Commercial CC BY-NC: This article is distributed under the terms of the Creative Commons Attribution-Non-Commercial 4.0 License (<https://creativecommons.org/licenses/by-nc/4.0/>) which permits non-commercial use, reproduction and distribution of the work without further permission.

**Abstract:** *The prosperity of the region and the standard of living of its inhabitants depend on many socioeconomic factors. The main goal of the paper is to evaluate selected factors of the Nitra Region in the Slovak Republic and to compare their level in individual districts with a focus on the mutual relationship between the educational structure of the population and employment. The research sample is composed of available data in the DATAcube, the database of the Statistical Office of Slovakia, and from results of the Population and Housing Census of the Slovak Republic: number of inhabitants, age structure, level of education, unemployment, and others. The data analysis is carried out by descriptive statistics, method of comparison with usage of tabular and graphic presentation of results. Results of the Nitra Region showed that a district with a higher educated population is associated with a lower rate of unemployment.*

## 1. INTRODUCTION

The main factors of the development of each region are the economic potential and the level of population education. Economic conditions and a professionally founded workforce have a direct impact on progress in all regions. The analysis of key factors is important for decisions about the socio-economic development in the given territorial unit. The document **National Strategy of Regional Development of the Slovak Republic (2010)** states the initial and strategic aims for the support of regional development in Slovakia.

The importance of optimal population characteristics lies also in the optimization of the structure and number of the population to support socio-economic development (Ondrušek, 2009). The ageing of the population of the Slovak Republic is manifested in a decrease in the share of the population in pre-productive age and an increase in the share of the population in productive and post-productive age (Kopřilová & Koprila, 2010). The age structure of Slovakia copies trends in most European countries and the ageing of the population is extending the productive period of inhabitants to ensure the necessary work activities (Országhová, 2017).

Higher qualification in human resources is a prerequisite for improving production capacity, sustainable economic growth, and competitiveness (Masárová et al., 2022). The unemployment rate is primarily correlated with the current economic development. The global economic crisis in the period of 2009-2010 significantly affected the unemployment rate in Slovakia, the consequences of which were manifested in disparities in the potential workforce between the districts of Slovakia (Hornýak Greganova & Pietrikova, 2017).

<sup>1</sup> Slovak University of Agriculture in Nitra, Faculty of Economics and Management, Tr. A. Hlinku 2, 949 76 Nitra, Slovak Republic

<sup>2</sup> ČSOB, Žižkova 11, 811 02 Bratislava, Slovak Republic

Analyses in European countries show that in the labour market, the number of people with low qualifications is decreasing because requirements for current job positions are set for a higher qualification, i.e., a higher level of education. In 2018, the unemployment rate of people with low qualifications (less than primary, primary, and lower secondary education) was 13.2% as the European average. In the category of persons with upper-secondary and post-secondary education, the unemployment rate was 6.2%. Highly qualified persons with tertiary education had an unemployment rate of 4.1% ([The risk of unemployment decreases with increasing education, 2019](#)). [Jalovaara et al. \(2019\)](#) investigated the level of education in the Nordic countries; research has confirmed that people with low education have become the smallest segment in the labour market for both sexes. Women have higher aspirations to obtain tertiary education, while for men upper secondary education remains their most widespread level of qualification.

[Lazíková et al. \(2022\)](#) state that the part of graduates of Slovak universities are not satisfied with the field of finished study; moreover, today's employers expect a higher level of soft and hard skills from graduates. By [Schleutker et al. \(2019\)](#) reports in different areas of industry in Italy and Finland were analysed and responses from managers in companies show that specific soft skills, especially teamwork and flexibility in development, are increasingly important. According to [Host'ovecký \(2013\)](#), digital competence is important for all graduates, and social networks can also be used in the process of skills development. [Kirin et al. \(2021\)](#) present results of a comparison of the course of education in a traditional educational environment and an on-line teaching environment.

There are also other factors related to the topic of workforce education and its application in the labour market, for example, the possibility for parents of small children (primarily women) to participate in the work process. [Papcunová et al. \(2023\)](#) surveyed opinions on the quality and availability of school facilities which are still a topical issue for Slovak municipalities. Obtained results could contribute to the improvement of the situation in regions, which is the basis for residents to join the labour process successfully.

## 2. MATERIAL AND METHODS

This paper aimed to evaluate selected workforce indicators in districts of Nitra Region in the period 2000-2022. Research data samples were generated from several available databases: DATAcube - a public database of the Statistical Office of the Slovak Republic; Population and Housing Census of the Slovak Republic and Central Office of Labour, Social Affairs and Family.

These factors of districts of Nitra Region were evaluated: number of inhabitants, economic age structure, unemployment rate, and level of education of residents. The mutual relationship between educational structure and employment of inhabitants in this region was under investigation. The research assumption was verified: A higher share of people with higher completed education in a given district is accompanied by a lower percentage of unemployment. Data were processed and evaluated via methods of time series analysis and descriptive statistics. The development of indicators over a while was graphically displayed.

## 3. RESULTS

The Nitra Region, with a total area of 635,372 ha, ranks fifth among the other regions of the Slovak Republic. Nitra Region consists of these 7 districts: Komárno District, Levice District,



Nitra District, Nové Zámky District, Šaľa District, Topoľčany District, Zlaté Moravce District. In 2022, the total population of the Slovak Republic reached approximately 5.43 million people. The total number of inhabitants in the Nitra Region decreased from 714,602 in 2000 to 670,696 in 2022. The gradual decrease in the number of inhabitants has occurred since 2010 (Slovakia's population fell for the second year in a row last year, 2022). Figure 1 shows the development of the number of inhabitants in Nitra Region in the period 2000 - 2022. In 2011, there was a change in the methodology for reporting births, which, in conjunction with the Population and Housing Census, was manifested by a shift in the data.

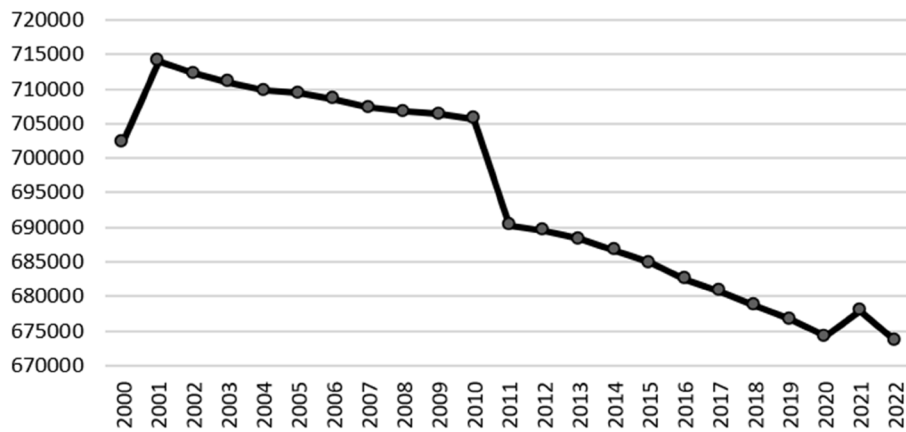


Figure 1. Development of population in Nitra Region

Source: DATAcube, 2023; own processing

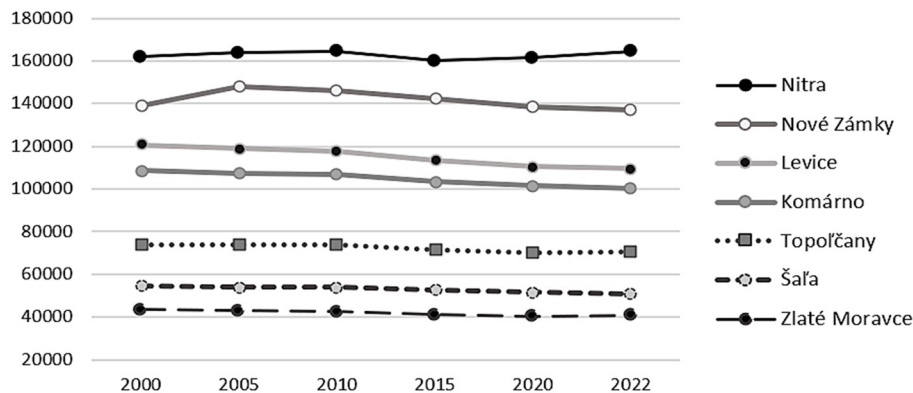


Figure 2. Development of number of inhabitants in districts of Nitra Region (2000-2022)

Source: DATAcube, 2023; own processing

Figure 2 presents the development of the number of inhabitants in districts of the Nitra Region in the period 2000-2022. The districts are arranged according to the number of inhabitants in absolute values. In the mentioned period, a slight decrease in the number of inhabitants was recorded except for Nitra. The Nitra District has the highest number of inhabitants, while the city of Nitra is also the capital of the region.

The next indicator is the population structure by economic age groups: pre-productive age (0-14 years), productive age (15-64 years), and post-productive age (65 and over). The increase in the quality of life and the average life expectancy is reflected in the increase in the post-productive population. In Table 1 there are summed up data about the structure of economic groups in all districts of the Nitra Region as of January 1, 2021. In the pre-productive age, the data ranged from 13.13% to 14.84%. In the category of productive age, the data are in the range of 67.14%

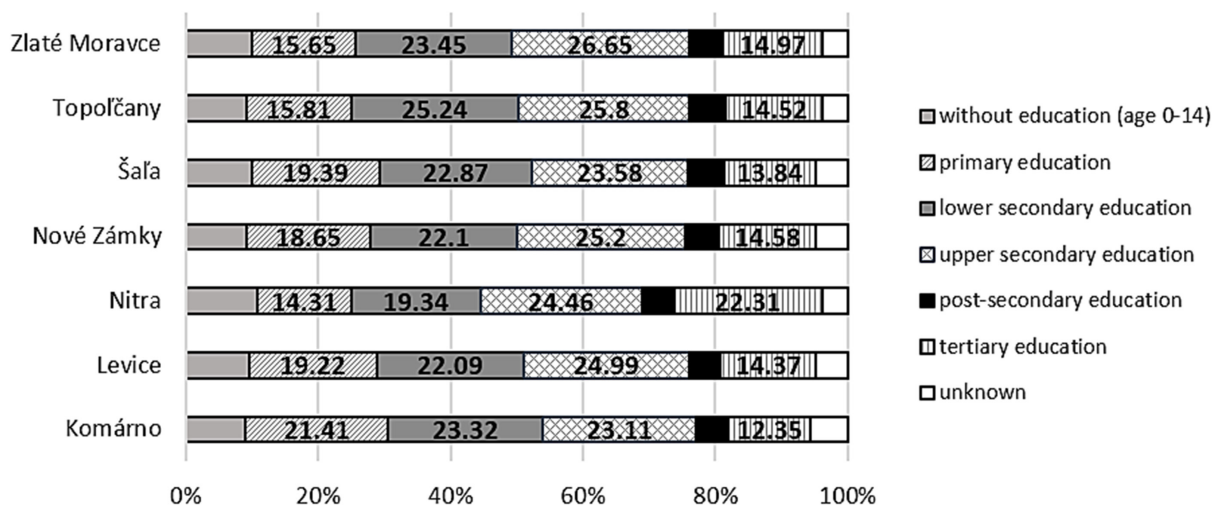
- 68.29%. The age category over 64 includes pensioners and working pensioners; data fluctuates in the range of 17.58% - 19.34%. It could be concluded that the population structure according to economic age groups in the districts of Nitra Region is balanced.

**Table 1.** Structure of economic age groups in districts of Nitra Region (to January 1, 2021)

District	Age group						Inhabitants overall (abs.)
	0-14 years (abs.)	0-14 years (%)	15-64 years (abs.)	15-64 years (%)	Over 64 years (abs.)	Over 64 years (%)	
Komárno	13,293	13.17	68,512	67.87	19,147	18.97	100,952
Levice	15,063	13.64	74,769	67.68	20,637	18.68	110,469
Nitra	24,452	14.84	110,642	67.14	29,694	18.02	164,788
Nové Zámky	18,148	13.13	93,295	67.52	26,725	19.34	138,168
Šaľa	7,276	14.13	35,152	68.29	9,049	17.58	51,477
Topoľčany	9,494	13.40	48,143	67.92	13,240	18.68	70,877
Zlaté Moravce	5,730	13.92	27,653	67.17	7,786	18.91	41,169

Source: Population and Housing Census 2021, own processing

Figure 3 presents the results of the state of education of residents in individual districts as of January 1, 2021 (according to Population and Housing Census 2021). Nitra region has developed a network of all types of schools: kindergartens, primary schools, different kinds of secondary schools, and universities. Tertiary education is available at three universities in the Nitra Region; two universities are situated in the city of Nitra. This is the main reason for the highest rate of tertiary-educated residents in Nitra District (22.31%).

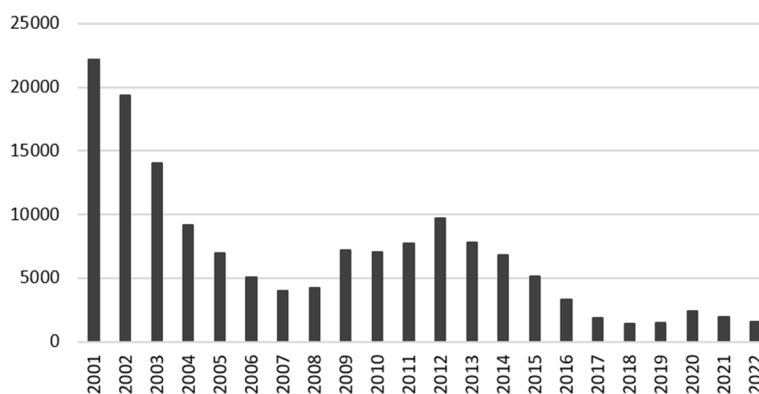


**Figure 3.** Level of education in districts of Nitra Region

Source: Population and Housing Census 2021, own processing

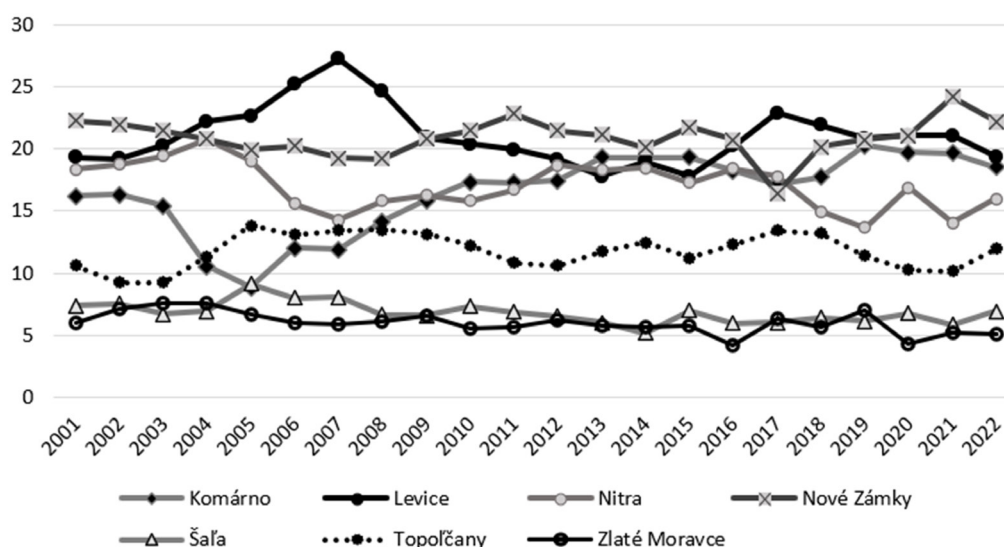
Figure 4 shows the development of unemployment in the age category 15-24 in the Nitra Region in the period 2001-2022 (expressed in absolute numbers). Development is irregular, high values in 2001 gradually decreased, and the increase occurred again in 2009 during the global financial crisis with a peak in 2012. During the COVID-19 pandemic in 2020-2022, based on state measures, unemployment was maintained with a very small increase.

Figure 5 shows a percentage comparison of the development of unemployment in individual districts. The percentage was calculated based on the number of unemployed in a given year in Nitra Region overall. The districts of Levice and Nové Zámky had the largest share.



**Figure 4.** Development of unemployment in Nitra Region (2001-2022, absolute values)

Source: DATAcube, 2023; own processing



**Figure 5.** Percentage share of the district in the total unemployment in the region (in the given year)

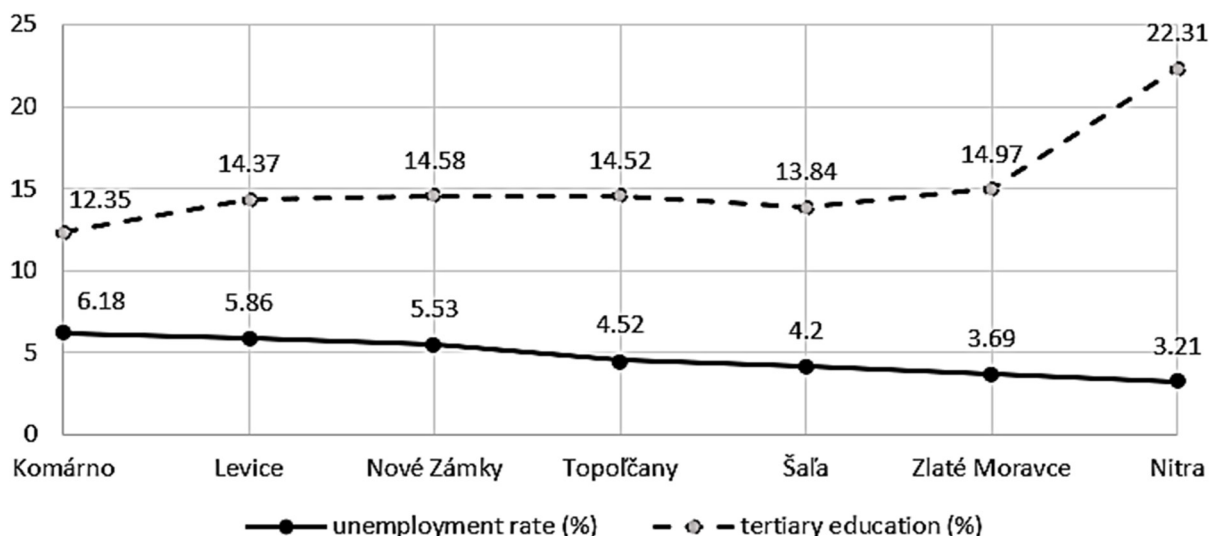
Source: DATAcube, 2023; own calculations

In Table 2 there are presented data about the unemployment rate in districts of Nitra Region as of December 31, 2021. The registered unemployment rate was 4.80% for the entire Nitra Region. In individual districts, the registered unemployment rate ranged from 3.21% (in Nitra District) to 6.18% (in Komárno District).

**Table 2.** Unemployment rate in districts as of December 31, 2021

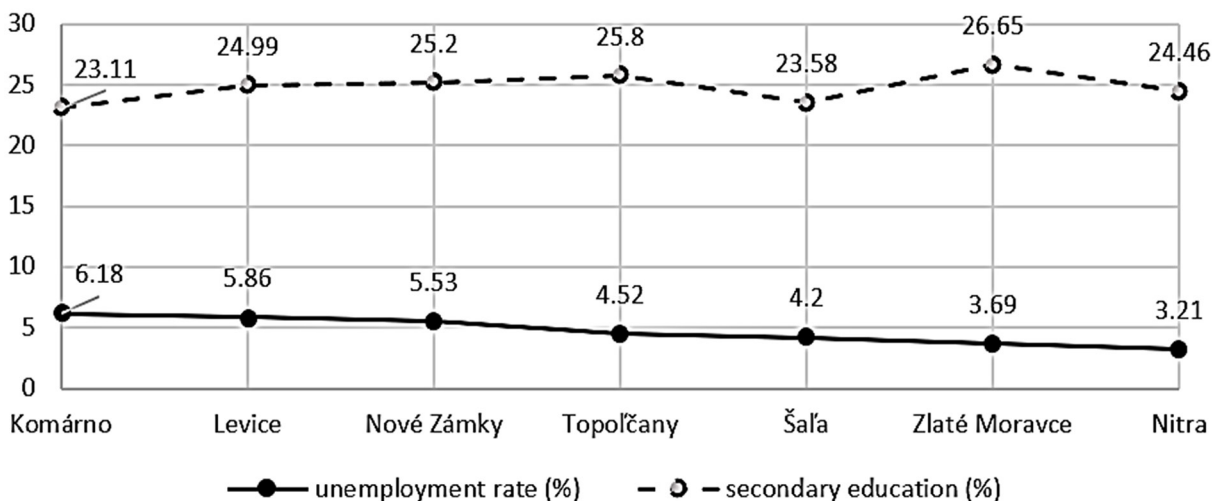
District	Economically active population	Job applicants together (JAT)	Disposable number of job applicants	Women	Unemployment rate calculated from JAT (in %)	Registered unemployment rate (in %)
Komárno	51,331	3,683	3,173	2,110	7.18	6.18
Levice	53,607	3,454	3,142	1,952	6.44	5.86
Nitra	82,030	3,028	2,630	1,758	3.69	3.21
Nové Zámky	69,704	4,181	3,854	2,406	6.00	5.53
Šaľa	26,457	1,292	1,112	762	4.88	4.20
Topoľčany	37,133	1,924	1,678	1,048	5.18	4.52
Zlaté Moravce	20,237	874	746	492	4.32	3.69
Nitra Region	340,499	18,436	16,335	10,528	5.41	4.80

Source: Unemployment - monthly statistics (2021), own processing



**Figure 6.** Unemployment rate and tertiary level of education in districts

Source: Own processing



**Figure 7.** Unemployment rate and secondary level of education in districts

Source: Own processing

Figures 6 and 7 show data of districts on the unemployment rate and the corresponding share of people with a given level of education (districts are initially arranged in descending order according to the data in Table 2). Figure 6 shows data about the unemployment rate (%) and the share of tertiary educated people (%). Likewise, Figure 7 shows data about the unemployment rate (%) and the share of people with secondary education (%). Data confirm that the unemployment rate is decreasing with a higher level of education in the district. It is important to mention that other factors also influence the given state.

#### 4. FUTURE RESEARCH DIRECTIONS

Changes in the labour market occur in connection with various fluctuations and crises in the economic, social or health sphere (e.g., the impact of the COVID-19 pandemic). Global problems affect a large part of the population in many countries, and the consequences of crises last for several years. Workers are looking for suitable employment and financial compensation in the labour market that is becoming interconnected across continents. [Rievajova and Privara \(2016\)](#) report



results about the migration of skilled workforce abroad, while the departure is reflected in the lack of qualified workers in many sectors and professions in the economy. Increasing migration abroad is also reflected among young people who leave Slovakia to study abroad and often stay there to work.

Employee migration is an important issue for many countries in the world. Research about workforce mobility was carried out in Australia and according to the results, only about five per cent of the workforce was defined as highly mobile; more than half of the workforce can be considered stable in a given region, unwilling to move even with a certain salary increase (Rolfe et al., 2020). How to maintain a trained workforce in the home country is a challenge for many countries and professions in Europe. Analyses examine various factors of departure and the possibilities of return in the home country, especially for younger age categories of qualified workers (Chevillard, 2021).

Both theoretical and empirical research examining the relationship between education and employment confirm the positive impact of higher education on a person's success in employment in the labour market. Obtained results about districts of the Nitra Region can be useful for improving interaction at the regional and local level in solving issues related to the education of young people as well as the adult population, and in improving the conditions of career application in this region.

## 5. CONCLUSION

The effective usage and flexibility of employees in the labour market is an essential determinant of economic performance and is associated with the appropriate qualification of the workforce. Analyses of selected indicators of the Slovak labour market confirm that the consequences of global problems and crises are reflected in the regions as well. The paper examined the relationship between the level of education of residents and the unemployment rate, while the focus was on the evaluation of data on the districts of the Nitra Region in the Slovak Republic. The obtained results confirmed that the unemployment rate is lower in districts with residents with a higher level of education.

In the current period, Slovakia faces a lack of qualified workforce. Companies are trying to solve this problem in various ways, e.g., by importing labour from abroad. Higher professional qualification in human resources is a prerequisite for the creation and transfer of innovations to companies and life in regions. The lack of workforce leads to the need for re-training of older employees for new kinds of professions.

## Acknowledgment

This paper was supported by the project Implementation of the virtualization of the physical laboratories by means of the control and automation systems in the field of Machinery Engineering (project number KEGA 020SPU-4/2023), and by the project: Implementation of the New EU Food Strategy in the Food Chain in Slovakia (project number: VEGA 1/0245/21).

## References

- Chevillard, G. (2021). Training, Migration and Retention of Doctors: Is Ireland a Danaides' Jar? Comment on " Doctor Retention: A Cross-sectional Study of How Ireland Has Been Losing the Battle". *International Journal of Health Policy and Management*, 10(10), 658. doi: 10.34172/ijhpm.2020.54
- DATAcube. (May 15, 2023). Retrieved May 15, 2023, from <https://datacube.statistics.sk/>
- Hornyak Greganova, R., & Pietrikova, M. (2017). Changes in Development of Regional Unemployment and Foreign Direct Investment in Conditions in Slovakia. In V. Klímová, V. Žitek (Eds.), *Proceedings of the 20th International Colloquium on Regional Sciences*, Brno: Masaryk University (pp. 147-154). <https://www.econ.muni.cz/en/colloquium-on-regional-sciences/past-colloquia/conference-proceedings-2017>
- Host'ovecký, M. (2013). Using of social network in education by technical and science students in Slovakia. In *2013 IEEE 11th International Conference on Emerging eLearning Technologies and Applications (ICETA)* (pp. 127-131). IEEE. <https://doi.org/10.1109/ICETA.2013.6674417>
- Jalovaara, M., Neyer, G., Andersson, G., Dahlberg, J., Dommermuth, L., Fallesen, P., & Lappgård, T. (2019). Education, gender, and cohort fertility in the Nordic countries. *European Journal of Population*, 35, 563-586. <https://doi.org/10.1007/s10680-018-9492-2>
- Kirin, S., Vasojević, N. A., & Vučetić, I. (2021). Education Management and Information and Communication Technologies. In V. Bevanda (Ed.), *Proceedings of the 5th EMAN Conference (Part of EMAN Conference Collection), Online/Virtual* (pp. 223-239). <https://doi.org/10.31410/EMAN.2021.223>
- Kopřlová, J., & Kopřla, M. (2010). Analysis of the development and structure of aging processes of the population of the Slovak Republic – specification for regions. *Social and political analyses*, 4(2), 28.
- Lazíková, J., Takáč, I., Rumanovská, L., Michalička, T., & Palko, M. (2022). Which Skills Are the Most Absent among University Graduates in the Labour Market? Evidence from Slovakia. *Social Sciences*, 11(10), 438. <https://doi.org/10.3390/socsci11100438>
- Masárová, J., Koišová, E., & Gullerová, M. (2022). Changes in the Educational Structure of the Workforce in Slovakia and Its Regions. In V. Bevanda (Ed.), *ERAZ Conference – Knowledge Based Sustainable Development: Vol 8. Conference Proceedings* (pp. 203-209). Association of Economists and Managers of the Balkans. <https://doi.org/10.31410/ERAZ.2022.203>
- National Strategy of Regional Development of the Slovak Republic. (2010). Retrieved May 3, 2023, from <https://www.mpsr.sk/narodna-strategia-regionalneho-rozvoja-slovenskej-republiky/59---2558/>
- Ondrušek, M. (2009). Socio-economic risks of EU population development. In *Proceedings of the international scientific conference Solving crisis situations in a specific environment*, Žilina: Žilinská univerzita (pp. 515-520).
- Országhová, D. (2017). Labour-force participation rate in context of demographic changes in regions of Slovakia. In V. Klímová, V. Žitek (Eds.), *Proceedings of the 20th International Colloquium on Regional Sciences*, Brno: Masaryk University (pp. 374-380). <https://www.econ.muni.cz/en/colloquium-on-regional-sciences/past-colloquia/conference-proceedings-2017>
- Papcunová, V., Dvořák, M., Vavrek, R., Mižičková, J., Harasimová, P., Vichová, M., & Váňa, T. (2023). Availability and Quality of School Facilities as a Determinant of Local Economic Development: The Slovak Experience. *Economies*, 11(2), 35. DOI:10.3390/economies11020035

- Population and Housing Census 2021. (2021). Statistical Office of the Slovak Republic. Retrieved March 15, 2023, from <https://www.scitanie.sk/obyvatelia/zakladne-vysledky/struktura-obyvatelstva-podla-vzdelania/>
- Rievajova, E., & Privara, A. (2016). Labour market and migration of skilled workers abroad. In T. Kliestik (Ed.), *Globalization and its socio-economic consequences*, 16th international scientific conference proceedings (I-V), Žilina: University of Žilina (pp. 1856-1863).
- The risk of unemployment decreases with increasing education. (September 05, 2019). Retrieved April 18, 2023, from <https://www.pesnetwork.eu/sk/2019/09/05/lmb3-educational-attainment/>
- Rolfe, J., Kinnear, S., & Borg, D. (2020). Factors affecting population and workforce mobility in Australia: a future of declining regional affinity? *Rural Society*, 29(1), 1-15. <https://doi.org/10.1080/10371656.2020.1761599>
- Schleutker, K. J., Caggiano, V., Coluzzi, F., & Luján, J. L. P. (2019). Soft skills and European labour market: Interviews with Finnish and Italian managers. *Journal of Educational, Cultural and Psychological Studies* (ECPS Journal), (19), 123-144. <https://doi.org/10.7358/ecps-2019-019-schl>
- Slovakia's population fell for the second year in a row last year. (2022). Retrieved May 5, 2023, from <https://domov.sme.sk/c/23143367/slovensko-demografia-2022-obyvatelia-pokles.html>
- Unemployment - monthly statistics. (2021). Central Office of Labour, Social Affairs and Family, the Slovak Republic. Retrieved May 5, 2023, from [https://www.upsvr.gov.sk/statistiky/nezamestnanost-mesacne-statistiky/2021.html?page\\_id=1060197](https://www.upsvr.gov.sk/statistiky/nezamestnanost-mesacne-statistiky/2021.html?page_id=1060197)







# Empowering Romanian Entrepreneurs to Develop Social Business

Oana Staiculescu<sup>1</sup> 

Received: August 30, 2023

Accepted: December 14, 2023

Published: March 16, 2024

## Keywords:

Social business;  
Entrepreneurs;  
Development



Creative Commons Non Commercial CC BY-NC: This article is distributed under the terms of the Creative Commons Attribution-Non-Commercial 4.0 License (<https://creativecommons.org/licenses/by-nc/4.0/>) which permits non-commercial use, reproduction and distribution of the work without further permission.

**Abstract:** *Social economy is essential for local or regional development. In Romania, social business is trying to scale, promoting the development of an alternative model of social inclusion for vulnerable groups. The establishment of a social enterprise represents a benefit both for the area in which it will carry out its activity and for the national economy as well, developing along with increasing the level of education and living of the population. Globally, in April 2023, the United Nations General Assembly adopted the resolution "Promoting the Social and Solidarity Economy for Sustainable Development" (A/77/L.60) which provides an official definition of social and solidarity economy and it can contribute to the achievement and localization of sustainable development goals. Therefore, this paper aims to come up with proposals to empower Romanian entrepreneurs to develop social businesses in order to carry out activities that will represent a real gain for the community and an important step in solving various problems.*

## 1. SOCIAL BUSINESS IN ROMANIA

In Romania, social enterprises are recognized and regulated by [Law No. 219/2015 on the social economy](#) which defines social enterprises as organizations that operate in an organized and continuous manner, with the aim of obtaining social benefits, such as the integration of disadvantaged people into the labor market or the development of local communities. There are also organizations and associations that support and promote the development of social enterprises in Romania, such as the possibility of providing information and support for social enterprises in the country. Regardless of the form of legal organization, each of these types of social enterprises has an important role in the social economy and supporting communities, the social programs implemented and the social services offered contribute to the increase in the standard of living by satisfying the needs of the respective community. The contribution of these social enterprises can be realized through various support measures for vulnerable groups, such as ([Popescu, 2011, p. 20](#)):

- integration on the labor market and combating discrimination;
- improving access and participation in initial and continuing education for vulnerable groups;
- promoting gender equality and combating the social exclusion of women;
- developing an efficient system of social services aimed at reducing the risk of marginalization and social exclusion;
- transnational initiatives in inclusive education and transnational initiatives on the labor market.

It is also important to mention that social enterprises in Romania can benefit from certain facilities through a support and encouragement mechanism that considers: financing from public and/or private, national or international sources; free of charge for the issuance of the certificate,

<sup>1</sup> Faculty of Law, University of Craiova, Alexandru Ioan Cuza street, no. 13, zip code 200585, Craiova, Romania

the social brand and the registration in the single record register of social enterprises; premiums and subsidies for the employment of young people at risk of social marginalization, unemployed over 45 years old, unemployed who are sole breadwinners of single-parent families, long-term unemployed or NEET youth; 50% of the expenses with professional training services for the settlement of professional training programs for own employees who belong to the vulnerable group. In addition, social insertion enterprises can benefit from the following facilities provided by the local public administration authorities (Law no. 219 on social economy, 2015):

- a) allocation of spaces and/or lands located in the public domain of administrative-territorial units/subdivisions, in compliance with the provisions of Government Emergency Ordinance no. 57/2019 on the Administrative Code, with subsequent amendments and additions, in order to carry out the activities for which the social brand was granted;
- b) support in promoting the products made and/or supplied, the services provided, or the works performed in the community, as well as in the identification of their sales markets;
- c) other facilities and tax exemptions granted by local public administration authorities, under the law.

At the same time, social insertion enterprises can also benefit from free advice from the state authorities that have powers in this field, both at the time of establishment and during the activity. In reality, this does not happen, either because social entrepreneurs do not use these counseling services, or because the state authorities do not offer this type of assistance, it only exists at a theoretical (legislative) level. Being a real incentive for community development and for raising the standard of living by integrating vulnerable people into work, the state authorities should give increased interest to social insertion enterprises. Also, through its central and local administrative authorities, the Romanian state can and should provide continuous support programs for social enterprises.

However, managing a social enterprise in Romania is a real challenge, especially when financial aspects are involved. On the one hand, the government faces challenges in ensuring a favorable environment for the development of social enterprises, and on the other hand lack of "information", "managerial skills" and "a predictable environment that emulates the development of such initiatives" (Lambriu & Petrescu, 2019, p. 77).

Even if it exists, the legal framework applicable to the social economy is quite fragile compared to the importance and particularities of the field, and the lack of involvement of central and local public authorities is obvious. Then, once established, social enterprises are on their own, having to look for support anywhere but public authorities, with all the responsibilities they assume towards the community. Part of these reasons and poor financial support are aspects that justify the small number of social entrepreneurs, who give up the idea of getting involved considering the effort they would have to make and the few benefits they would get. Given the fact that entrepreneurs are focused on the social mission they have assumed, before starting such a project, they must analyze the real possibilities to contribute to the development of the community and the solution of various problems, precisely to avoid the occurrence of situations that lead to the failure to fulfill the assumed social goal.

Taking into account the challenges encountered in practical activity, the number of Romanian social enterprises is not very large compared to other European countries. According to the data available from the Unique Register of Social Enterprises - extracted - updated June 2023 (Romanian National Agency for Employment, 2023) out of the total of 2904 social enterprises that were

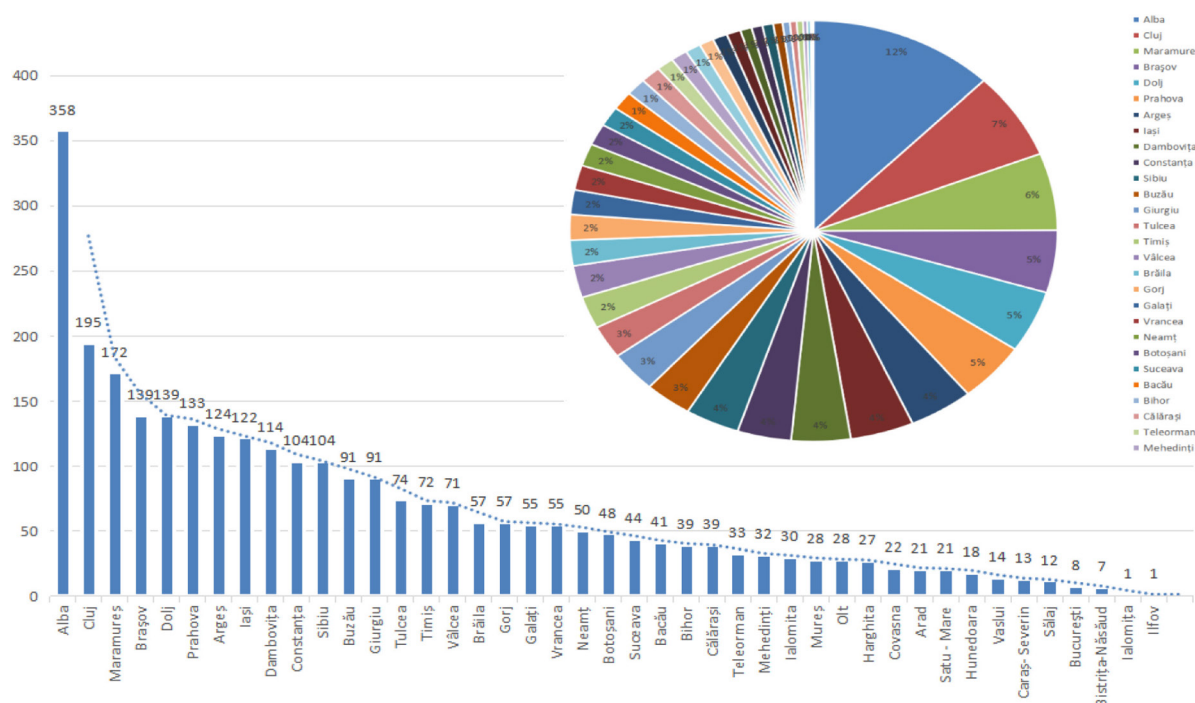
registered in Romania, only 2623 have a valid certificate, and listed as active. The remaining 281 social enterprises appear in the national database with the certificate withdrawn, expired, or suspended. The indicators discussed can be seen in the table below.

**Table 1.** The current situation of social enterprise certificates in Romania

Certified Romanian certificate 30.06.2023	Social enterprises registered in the Unique Register of Social Enterprises
Valid	2623
Withdrawn	248
Expired	26
Suspended	7
<b>Total</b>	<b>2904</b>

Source: Own processing from [Romanian National Agency for Employment, 2023](#)

Considering the data collected from the Romanian National Agency for Employment, a detailed analysis was carried out on the situation of existing social enterprises at the level of each county in Romania, as can be seen in Figure 1.



**Figure 1.** Distribution of social enterprises in Romania by county

Source: Own processing from [Romanian National Agency for Employment, 2023](#)

Therefore, the centralization number of social enterprises in the Romanian counties shows the fact that in some areas is a greater interest in doing this type of business. Figure 1 shows that Alba is the county with the largest number of registered social enterprises, namely 358, then Cluj with 195, Maramureș with 172, and the counties of Brașov and Dolj with 139. At the opposite pole are the counties of Ilfov and Ialomița with only one social enterprise, Bistrița-Năsăud with 7, and Sălaj with 12. It is amazing that in the capital of Romania, Bucharest, there are only 8 registered social enterprises until June 30, 2023. It should also be mentioned that out of the total number of 2904 existing social enterprises in Romania, only 185 are active insertion social enterprises and have a social brand according to the legislation.

## 2. EMPOWERING ROMANIAN SOCIAL BUSINESS

Empowering Romanian social business can be quite a difficult operation. However, public authorities should have a more notable involvement in the sphere of businesses whose benefits return to the local communities they belong to. For these reasons, the following can be considered:

- provide financial support and resources specifically tailored for social businesses, including grants, loans, and investment opportunities. This can help social entrepreneurs start or scale their ventures and address the financial challenges they often face;
- offering training programs and mentorship opportunities to social entrepreneurs, such as: business development, financial management, marketing and other essential skills needed to run a successful social business;
- facilitate networking events, conferences and platforms where social entrepreneurs can connect with like-minded individuals, potential partners, and investors (in this way it can encourage collaboration among social businesses to share best practices and create a supportive ecosystem);
- advocate for policies that recognize and support social businesses (which can include tax incentives, simplified legal frameworks and procurement preferences for social enterprises). Engage with policymakers to ensure the creation of an enabling environment for social businesses to thrive;
- raise awareness about social entrepreneurship and its impact on society (educate the public, students, and aspiring entrepreneurs about the concept of social businesses, their mission and the potential they have in solving social and environmental challenges);
- encourage social businesses to measure and report their social and environmental impact (provide guidance and tools to help them assess their outcomes and communicate their impact to stakeholders effectively);
- develop and maintain a supportive infrastructure for social businesses, including incubators, co-working spaces, and business development centers (resources can provide access to office facilities, shared services, and a supportive community);
- promoting social public acquisitions through the development of tools such as (Vameşu & Achiței, 2021, p. 7): creating a specialized electronic platform, including in the electronic acquisitions catalog filters for quick registration and identification of social enterprises and providing examples of good practice regarding social public procurement from other states;
- foster collaboration between social businesses and research institutions (an initiative that can promote research on social entrepreneurship and provide valuable insights to improve the effectiveness and sustainability of social businesses).

By implementing these indications, Romania can create a more favorable environment for social businesses to grow and make a positive impact on society.

## 3. THE RESOLUTION “PROMOTING THE SOCIAL AND SOLIDARITY ECONOMY FOR SUSTAINABLE DEVELOPMENT”

In April 2023, the United Nations General Assembly adopted the resolution “Promoting the Social and Solidarity Economy for Sustainable Development” (A/77/L.60). The aim of this resolution is to recognize and promote the social and solidarity economy (SSE) as a means to achieve sustainable development goals (United Nations General Assembly, 2023). It calls for collective action and policy support to foster the growth and impact of SSE initiatives worldwide.



**Figure 2.** Importance of SSE as a means to achieve sustainable development

**Source:** Own processing

As can be seen from Figure 2 sustainable development can be achieved if social entrepreneurs take into account five important objectives:

- potential to address poverty and inequality by creating decent work opportunities, empowering marginalized groups, and promoting fair distribution of resources and wealth (the resolution recognizes the importance of SSE in achieving the goals related to poverty eradication);
- generating employment, particularly for vulnerable and marginalized groups: by supporting SSE initiatives, governments can stimulate job creation in sectors such as cooperatives, social enterprises, and community-based organizations.
- emphasizes local economic development, empowering communities to be self-reliant and resilient (the resolution recognizes the importance of SSE in fostering local entrepreneurship, enhancing community participation, and promoting sustainable production and consumption patterns);
- encourages innovative approaches to addressing social and environmental challenges (the resolution acknowledges the potential of SSE in promoting social innovation, supporting grassroots initiatives, and fostering collaboration between different stakeholders, including governments, civil society, and the private sector);
- the resolution calls for the development of supportive policies and frameworks to promote SSE in order to create an enabling environment to thrive and contribute to sustainable development (includes measures such as access to finance, capacity-building support, legal recognition, and favorable tax incentives).

Overall, the resolution adopted by the United Nations General Assembly highlights the importance of SSE as a means to achieve sustainable development, reduce poverty, create decent work, and foster inclusive and resilient communities promoting economic growth, social equity and environmental sustainability.

#### **4. FUTURE RESEARCH DIRECTIONS**

An important initiative for future research in social business could be focused on understanding the long-term impact and sustainability of social enterprises. This research could explore the factors that contribute to the success and longevity of social enterprises, as well as the

challenges they face in maintaining their social and environmental missions over time. The circular economy would also fall into the same area of interest because social businesses are increasingly adopting circular economy principles and models, such as upcycling, recycling, and sharing economy platforms in order to minimize waste, maximize resource efficiency, and promote sustainable production and consumption.

Another area of research could be examining the effectiveness of different business models and strategies employed by social enterprises. This research could help identify best practices and innovative approaches that can enhance the social impact and financial sustainability of social businesses.

Furthermore, studying the role of social enterprises in promoting inclusive economic development and reducing social inequalities could be a valuable research initiative. This would involve investigating how social enterprises can effectively address issues such as poverty, unemployment, and inequality, and contribute to the overall well-being of communities.

Additionally, research on the collaboration and partnerships between social enterprises, government agencies, and other stakeholders could provide insights into how these collaborations can be strengthened to create more impactful and sustainable solutions to social and environmental challenges. As society becomes more conscious of social and environmental issues, and as investors and consumers demand greater accountability and impact, these trends are likely to shape the future of social business.

Lastly, exploring the role of technology and digital innovation in social business could be an important area of research and can include: the use of digital platforms for crowdfunding, social impact measurement tools, and the application of artificial intelligence in order to enhance social impact and operational efficiency. Practically, this field of research could investigate how social enterprises can leverage digital tools, platforms, and technologies to increase their reach, efficiency, and impact.

Therefore, future research in social business should focus on understanding the factors that contribute to the success and sustainability of social enterprises, exploring innovative business models and strategies, examining the role of social enterprises in promoting inclusive development, investigating collaborations and partnerships, and exploring the impact of technology on social businesses.

## **5. CONCLUSION**

X-raying the Romanian community would lead to the identification of a series of problems since each social category (whether we are talking about a vulnerable category or another) faces its difficulties, and therefore the branch of the social economy must enjoy special attention from the part of the state authorities. In the event that the state continues to focus only on investments in the general economy and to support mainly profit-oriented companies, this will never lead to general development, because the discrepancy between social class categories will continue to exist, and this discrepancy can only be reduced with the help of social enterprises, whose activity determines an increase in the level of education and living mainly among the disadvantaged categories. For this reason, social inclusion can be achieved through the collaboration between the general economy and the social economy so that the representatives of these disadvantaged categories have a real chance to engage and grow within the community they belong to.



Social enterprises in Romania face serious challenges that prevent their establishment and growth. That is why it would be necessary to develop and implement a reform in the field of social economy, by evaluating this branch, identifying legislative deficiencies, the needs of social enterprises, but also the problems of the community and by finding administrative solutions and ensuring the necessary support for the establishment of new social enterprises, as well as for their development and the implementation of various social programs to support the community. Also, from the perspective of active policies, the assessment of the impact of employment measures by disadvantaged and vulnerable people and the adoption of the necessary legislation to protect their rights and create optimal conditions for their integration into the labor field must be pursued.

At the same time, viable legislative solutions must be identified and adopted to stimulate and support social insertion enterprises, by granting financial aid in the case of hiring vulnerable people. Without financial support from the state authorities and in the absence of facilitating access to various financing programs, social enterprises cannot fulfill the social mission they have assumed. Moreover, the lack of funding sources is the main impediment to the development of social enterprises and the social economy, all the more so since these types of enterprises are not focused on profit, so they cannot support themselves exclusively, but need an economic involvement from the state authorities and various sponsors they find and convince to join their mission. No matter how much they would like to do so, no social entrepreneur can single-handedly support a social enterprise financially from the moment of its creation and throughout its existence, since its activity is not limited to a single action; a social enterprise must support the community continuously, by developing and implementing numerous programs of a social nature.

In this sense, public authorities should promote, first of all, the opportunities through which social enterprises can access intern or extern funds (public or private funds), respectively the stages they must follow in order to enroll in such financing programs. The promotion can be done by organizing courses for representatives of social enterprises that address the topic of funding sources offered to social enterprises, by establishing a department within the Ministry of Labor and Social Solidarity, which will be the contact point between the state and social enterprises, by organizing sessions of information before launching a financial support program, etc. The purpose of the promotion is to inform existing social entrepreneurs, but it can also lead other people to decide to establish social enterprises and get involved in solving community problems, with the guarantee that they will benefit from all the support from the state authorities after starting a business social. Among the most important aspects in the area of information are: the awareness of the population, the presentation of the types of enterprises that can operate in this field, the stages that must be followed in order to be established, the role of these enterprises in society, as well as the elaboration and presentation of the results of various surveys and studies regarding the categories of disadvantaged people and the measures that should be implemented to support them. At the same time, analyses can be carried out targeting existing social enterprises, in order to ascertain the problems they face and to submit them to debate, in order to identify, together with them, the appropriate solutions. Last but not least, it is necessary to develop a strategy by the state authorities with competences in the field of social economy, which has long-term objectives and which foresees two essential directions, namely the support given to social enterprises and the support given to disadvantaged communities. Just as national strategies can and are developed in many other fields, a strategy can also be developed for the development of the social economy, starting from the idea of its importance for society and the economy in general.

The importance of social business cannot be overstated. In today's rapidly changing world, businesses need to go beyond profit-making and focus on creating a positive impact on society and the environment. Social business provides a framework for businesses to address pressing social issues while still being financially sustainable and allows businesses to contribute to the well-being of communities and address societal challenges. By focusing on social impact, businesses can tackle issues such as poverty, inequality, and environmental degradation. This not only improves the lives of individuals and communities but also helps build a more equitable and sustainable society.

Furthermore, social business can enhance a company's reputation and brand image. Consumers are increasingly conscious of the social and environmental impact of the products and services they purchase. By engaging in social business activities, companies can differentiate themselves in the market, attract socially conscious consumers, and build customer loyalty. Social businesses can also attract and retain talented individuals who are passionate about making a positive impact. Lastly, social business can lead to long-term financial sustainability. By addressing social issues, businesses can create new market opportunities and tap into previously underserved markets. Additionally, social business initiatives can lead to cost savings through improved efficiency, innovation, and reduced risks. This, in turn, can contribute to the long-term success and profitability of the company.

In conclusion, social business is not just a moral imperative but also a strategic necessity. It allows businesses to address social challenges, enhance their reputation, attract top talent, and achieve long-term financial sustainability. By integrating social impact into their core business models, companies can contribute to a more inclusive, equitable, and sustainable world.

## References

- Law no. 219 on social economy. (2015). *Official Gazette of Romania* (Part I, No. 561) with subsequent amendments and additions. Retrieved May 18, 2023, from: <https://lege5.ro/App/Document/g4ztombzgq/legea-nr-219-2015-privind-economia-sociala>
- Lambriu, M., & Petrescu, C. (2019). *Social enterprises and their ecosystems in Europe. Updated country report: Romania*. European Commission. Luxembourg: Publications Office of the European Union. Retrieved May 18, 2023, from: <http://ec.europa.eu/social/main.jsp?advSearchKey=socenterfiches&mode=advancedSubmit&catId=22>
- Popescu, R. (2011). *Grupurile vulnerabile și economia socială. Romi și femei în dificultate*, Editura Expert, București.
- Romanian National Agency for Employment. (2023, June 30). *The Unique Register of Social Enterprise. Records*. Retrieved July 1, 2023, from: <https://www.anofm.ro/index.html?agentie=ANOFMstatistica&categ=9&subcateg=1>
- Vameșu, A., & Achiței, V. (coord.). (2021). *Raport anual de cercetare privind economia socială. Barometrul economiei sociale din România*. Developed within the project "Acceleratorul de Întreprinderi Sociale!", contract POCU/499/4/16/127384, co-financed by the European Social Fund, through Romanian Operational Programme (OP) "Human Capital" 2014-2020. Retrieved May 20, 2023, from: <https://acceleratorul.alaturidevoi.ro/wp-content/uploads/2021/06/Barometrul-Economiei-Sociale-2021-ADV-Romania.pdf>
- United Nations General Assembly. (2023, April 18). *The resolution Promoting the Social and Solidarity Economy for Sustainable Development (A/77/L.60)*. Retrieved May 18, 2023, from: [https://unsse.org/wp-content/uploads/2023/05/A\\_RES\\_77\\_281-EN.pdf](https://unsse.org/wp-content/uploads/2023/05/A_RES_77_281-EN.pdf)



### Additional reading

- Decision no. 585 for the approval of the Methodological Norms for the application of Law no. 219/2015 on the social economy (2016). *Official Gazette of Romania* (Part I, No. 660).
- European Center for Not-for-Profit Law. (2012). *Legal framework for social economy and social enterprises: a comparative report*. UNDP Regional Bureau for Europe and the Commonwealth of Independent States. Available at [https://ecn1.org/sites/default/files/202009/442\\_ECNL%20UNDP%20Social%20Economy%20Report.pdf](https://ecn1.org/sites/default/files/202009/442_ECNL%20UNDP%20Social%20Economy%20Report.pdf)
- Institute of Social Economy. (n.d.). Available at: <http://www.ies.org.ro/ce-este-economia-sociala-1>
- Ministry of Labor, Family, Social Protection and the Elderly. (2016). Visual Identity Manual for the specific visual identity element of the social enterprise of insertion from 04.10.2016. *Official Gazette of Romania* (Part I, No. 816).
- Valoria, CSRmedia.ro. (2021-2016). *Dynamics and Perspective of the CSR field*, Studies made with the support of: Penny, Tenaris Sitcotub, Vodafon, Unilever, Coca-Cola HBC Romania, Mol, Fundația Groupe Renault România, Groupama Asigurări etc., Editions 2020-2016. Available at: <https://www.csrmedia.ro/studii-csr/>





# The “Black Swan” Is “Green”: The Role of the Financial Sector in the Green Transition

Daniela Bobeva<sup>1</sup> 

Received: August 14, 2023  
Accepted: October 27, 2023  
Published: March 16, 2024

## Keywords:

Green transition;  
Green finance;  
ESG



Creative Commons Non Commercial CC BY-NC: This article is distributed under the terms of the Creative Commons Attribution-Non-Commercial 4.0 License (<https://creativecommons.org/licenses/by-nc/4.0/>) which permits non-commercial use, reproduction and distribution of the work without further permission.

**Abstract:** *The European Union has started an ambitious and unique transition to a green economy. The financial sector is assigned a key role in the transformation process. While the legal framework of the transition is already developed, many challenges remain to be resolved to achieve a smooth functioning of the financial system within the changing environment. The article explores theoretical views on the green transition and the role of the financial sector. The impact and the risks of the ongoing reforms in the financial sector are identified. The applied methodology is based on a combination of qualitative and quantitative analysis using ESG data, as well as data from a special survey aiming at capturing the views of companies with significant carbon emissions on their relationship with the banks in the changing regulatory and financial framework.*

## 1. INTRODUCTION

The European Union has embarked on an ambitious transition to a green economy. This transition transforms the entire economy, and the financial sector is assigned a key role in achieving the Paris Agreement goals. To fulfill its new mission, the financial sector has initiated large-scale changes in its functions and management. Using Nassim Taleb’s metaphor from his Black Swan theory, what happens in the financial sector falls under the understanding of the “black swan”, only now it is “green” (Taleb, 2007). The green transition in the EU takes place in an unfavorable external environment marked by COVID-19 and its consequences, Russia’s invasion of Ukraine, energy uncertainty and high inflation. In this environment, the financial sector should restructure its main activities and minimize the risks to financial stability.

The article identifies the main risks the financial system faces concerning climate change and the transition to a green economy, in order to outline the factors for successfully fulfilling the important mission of the sector in the transition to a climate-neutral green economy. The theoretical views on the green transition as well as the policies carried out by the European Union are studied here, seeking an answer to the question of how much the financial sector can contribute to the green transition and how this will affect its stability and role as a financial intermediary. The literature review focuses on the theoretical deficits in the conceptualization of the green transition that may create risks for its implementation. An unconventional view of the relationship of the green transition with the economic theory is presented. The main goals, tasks and regulations of the financial sector concerning the green transition are analyzed. In particular, the progress of the Bulgarian banking system (specifically 18 banks) in the implementation of the goals of the green transition is examined.

The research methodology includes quantitative and qualitative analysis. Green transition research is challenged by the limited data and short time series. To fill in the data gap, two empirical studies were conducted. The progress in carrying out the reforms in the banking sector is tracked based

<sup>1</sup> Economic Research Institute at the Bulgarian Academy of Science and Plovdiv University, Bulgaria

on the annual reports of the banks and the non-financial declaration with the ESG indicators data. The decarbonization of the economy requires a new model of relationships between the banks and their energy-intensive clients and carbon dioxide emitters. To investigate the change in these relationships, an empirical study of the enterprises with the largest carbon emissions is conducted.

The main thesis here is that the financial sector has started its green transition despite the unfavorable external environment. However, in this initial stage, there are problems and challenges and their resolution is of key significance to whether the financial sector will fulfill its mission in preserving the financial stability and expanding the financial intermediation.

## 2. WHERE DOES THE GREEN TRANSITION SEND THE ECONOMIC THEORY?

A good theory is the basis for a good economic policy. Comparing the main economic theories with the recent concepts of the green economy leads to the conclusion that the green transition challenges the conventional economic theory. Despite the strong evidence of the economy's culpability for climate change and the sense of academic agreement on the need for a green transition, how it is carried out provokes debates within the main economic schools. The focus is on the relevance of the theory of growth. The theory of **Malthus (1798)** has sent a warning of the ultimate carrying capacity of the earth and the depletion of the natural resources associated with the increasing population. This theory has been criticized for more than two hundred years, mainly for ignoring technological development and the ability of the economy to grow. John Stuart Mill (**Mill, 1848**), in Chapter Six "Of the Stationary State" of his work "*Principles of Political Economy*", argues that "the logical conclusion of the endless growth is the destruction of the environment and a reduced quality of life". From here he derives the need for the economy to always be in a "steady state". His views in this area were later developed by many economists. Schumpeter **Commoner (1971)** warns that modern technology causes increasing attacks on the environment.

It seems that the debate on the green transition has given additional impulse to the degrowth theory. Already in the 1970s, scientists like **Gorz (1975)** declared themselves against high economic growth, pleading for reduced ones to spare natural resources. On the other side of this century-old discussion are the economists who rely more on the spontaneity in the development of the economy and the ability to adapt to nature, on the one hand, and the population and its necessary resources, on the other.

In recent years, the debate on whether to limit economic growth to reduce the harmful impact on the climate has involved two Nobel Prize winners in economics – Joseph Stiglitz and William Nordhaus. This discussion is significant for the financial sector, which is very sensitive to economic growth, and its slowdown or limitation could lead to a decrease in financial intermediation and an erosion of financial stability. There is a wide political consensus, sealed in the 2015 Paris Agreement, on the need to limit global warming by reducing the temperature by 1.5 degrees. The Dynamic Integrated Model of Climate and the Economy (DICE), developed by **Nordhaus (2018)** however, shows that the goal of the UN policy to reduce temperatures by 1.5 degrees would bring more poverty to humanity. The relevance of the model is disputed by **Stern et al. (2021)**. According to Stiglitz, it is not necessary to cut growth to achieve climate neutrality.

**Yergin (2020)** quite aptly makes a comparison between the green transition and the industrial revolution. "I was struck by how different this one is. Whereas technology and economic advantage drove earlier transitions, public policy is now the most important factor." In this regard,

economic science has a problem, since the engine of the process is not the spontaneous engine of the economy, but the state and the perceived necessity, which does not necessarily coincide with economic rationality. On the other hand, the green transition takes place in a much shorter period, unlike the industrial revolution. The time and term of the transition are the subject of serious scientific debates since they determine the policy decisions concerning the target date for carbon neutrality. While some believe it is too late and the lost time should be made up for, others believe that climate change does not need to produce shocks to the economy and can be limited by a more gradual reduction of emissions.

The difficulties of some countries, including in Central and Eastern Europe, are expected to be compensated with more financial resources and more social programs for the affected. However, in this regard, compensating time with money can be successful with effective use of the financial resource, which is by no means certain in terms of either the amount of absorbed financial resources or the efficiency of their use. In this connection, some authors pay attention to the risk of divergence in the transition to a climate-neutral economy (Bobeva et al., 2021).

The literature review shows that the green transition has challenged the conventional economic theory opening the discussion on the fundamental questions of whether economic growth should be slowed down or reduced, whether the state should play a decisive role in the economic transformation, whether the transition should be carried out as a shock therapy or gradually, whether convergence or divergence in the EU will be taking lead.

### 3. THE ROLE OF THE FINANCIAL SECTOR IN THE GREEN TRANSITION

Financial theory has been enriched with new concepts like green finance, climate finance, greening financial sector, green bonds, and others. They are positioned in the set of concepts of sustainable development and sustainable economy. The understanding of “sustainable finance” is broader than the concept of “green finance”. “Sustainable finance” covers everything related to both environmental and social issues. “Green finance” is mainly used when environmental aspects are considered. “Climate finance” refers to finance primarily related to climate change (in the context of the UN climate change negotiations).

The green transition changes the fundamental role of the financial sector. The financial sector is the main intermediary in the accumulation and distribution of the huge public investments that are set aside for the realization of the goals of the transition. In the transition, the financing function of the sector is limited regarding a significant segment of the clients – companies with high carbon emissions. The transition requires changes in the internal structure and functioning of the financial institutions. The institutional and regulatory framework in which the sector functions changes, as well as the ratings of the rating agencies.

The funding and the financial package are the main tools for implementing the green transition in the EU, as well as for solving the economic and social problems it creates. The question is whether the large financial flows at the European and national level are a sufficient incentive and engine to implement the green transition without challenging the economic and financial stability as well as the living standards. There is a consensus between theory and policy decisions that a wide range of instruments should be used, including emission prices, investment programs, public grant schemes, capital market interventions, standards, regulations, and labeling<sup>2</sup>.

<sup>2</sup> Labeling here means determining which investments and activities are climate friendly and which are not.

The financial aspect of the green transition is a challenge to the financial theory. Substitution of the investments in traditional carbon-intensive sectors with low-carbon or neutral ones is expected to lead to significant decarbonization. However, investments in alternative green activities generally are initially expensive, though the subsequent costs are low. This type of investment has a relatively low and long-term return. The demand for alternative investment opportunities significantly exceeds the supply of such. Not the market, but the regulatory authorities decide what and how to be financed. As it seems, the green transition, in addition to being stimulated by the financial flows, is also a highly administrative process – with racing against time new regulations, taxes, restrictions, activities labeling, etc.

This feeling is intensified by the conditionality funding regime, introduced in the EU. The “money-for-reforms” principle is used to force countries with problems in the areas of legality, corruption and the effectiveness of the institutions, to carry out the relevant reforms. This is supplemented by the refusal of most countries to benefit from the debt part of the financial package. Thus, the overall financial package decreases and creates a risk for the achievement of both decarbonization and the expected impulse on economic growth.

The financial sector may play a decisive role in the green transition but the risks and challenges beyond climate change remain, i.e. international political tension, war in Ukraine, economic downturn, population aging, and inflation. The risks to financial stability increase. The green transition of the financial sector has to be conducted prudently with vigilance.

#### **4. IS FINANCIAL SECTOR GREENING?**

The method of restructuring of the financial sector is defined as regulation-led greening of the financial system. The greening induces a large-scale legal reform with eleven new regulations and directives specifically dedicated to the financial sector. Although the reform is a long process, at this stage, the main legal framework has been created, and the regulation on taxonomy ([Regulation EU, 2020](#)) occupies a central place in it. Reporting and disclosure requirements expand, and the financial institutions have to significantly increase their capacity to analyze and assess the climate risks and their impact on the client exposures. The most significant changes occur in risk management inside financial institutions by adding climate risks, conducting green stress tests, and calculating new indicators like the Green Asset Ratio (GAR).

Enlarging mandates and tasks of the financial regulatory and supervisory authorities includes expanding the analytical activity and the control functions of these institutions and updating the macroprudential supervision. New informal associations of regulatory bodies and academic institutions emerge for cooperation in the process of greening the economy and the financial sector. Such an example is the Network for Greening the Financial System ([NGFS, n.d.](#)).

Rating agencies also incorporate climate risks in their credit rating methodology. New agencies are established to create green ratings based on a set of criteria assessing the degree of compliance with the goals for reducing greenhouse emissions, limited use of natural resources, and other environmental indicators.

All these large-scale changes in the financial system, united in the concept of greening it, create new opportunities, but also risks for it. For this article, a study of the Bulgarian banking system (of 18 Bulgarian banks) was conducted. This study allows us to draw some conclusions.

Driven by both the new regulatory requirements and the initiative and empathy of the banks themselves, the green transition in the banking system happens despite the deterioration of the external environment. Most banks, especially those that are subsidiaries of foreign large groups, have already added to their strategies and operational targets the expansion of their green portfolio at the expense of reducing the brown portfolio. One of the identified challenges is that the capacity of the smaller banks to catch up with the larger banks in terms of the green transition is limited. This refers to the development of own strategies for the green transition, provision of advice and assistance to the clients in the restructuring towards a climate-neutral economic activity, and creation of effective internal systems for assessing the portfolio risks in the development of new products. Thus, the green transition may turn out to be a factor of divergence between the larger and the smaller banks in the financial and especially in the banking system.

The study shows that all banking institutions carry out an active policy and specific actions to reduce the carbon footprint of their activities. Some banks report around 30% reduction in emissions over the past three years. In this regard, another challenge appears – reducing own carbon footprint relates to closing offices, and expanding digital services, which, despite the advantages of reducing carbon emissions and reducing banks’ costs, leads to restriction of the access to financial services of specific clients in the older age groups, as well as the less financially literate clients.

The study data show that intense regulations in the financial sector for its greening could reduce credit activity to large sectors of the economy. The limited technological options for green investments could create credit bubbles in the available few. For example, high energy prices have encouraged significant private investments in photovoltaic plants. With the collapse of the prices during the summer months and the oversupply of this type of energy, there is a risk to the credit servicing. The problem is that the technological alternatives for investments that can be qualified as green are few and they are mostly renewable energy sources.

Since the regulatory requirements for corporate credits and portfolios are more comprehensive (stricter and much more in number), there is a risk that the banks will focus more on retail, which from the point of view of the risk profile of the banks will be more profitable. Retail banks may be in a better position, less exposed to changing their client base. However, this will encourage a bubble in the property market that is already quite inflated.

Greening the banking business suggests diverse practices depending on the size and the current portfolio of the banks.

## **5. HOW THE GREENING OF THE BANKS CHANGES RELATIONS WITH CLIENTS**

Since acquiring data on the progress of the green transition in the financial system is limited, an in-depth study (BAS, n.d.) is conducted on a 20% sample of the largest industrial carbon emitters in Bulgaria. The questionnaire includes questions to clarify whether and to what extent the relationship between banks and their carbon-emitting clients changes. Some of those companies admit that they have to reduce their business while others foresee complete closure. The companies demonstrate understanding and support for the green transition. The key question raised by the companies is how this transition should be carried out since there are lots of challenges. The study reveals an important consideration that a large part of the biggest CO<sub>2</sub>-emitting companies do not depend on bank credits. This limits the impact of the banks

on decarbonization. Statistical data confirm this conclusion. Emission-intensive sectors, including mining, electricity production and distribution, paper, glass, and transport, contribute about 40% to the GDP in 2022. Their restructuring over the last decade relates mainly to improving energy efficiency, but the credits to these sectors are significantly smaller as a share of the entire bank portfolio. For example, credits for the mining industry decreased and by December 2022 they were only 210 in number with a total value of about BGN 149 million (which is 0.18% of all credits in the system). This means that the measures to limit the crediting of the large carbon-emitting companies through the banking system will not have an effect in the case of Bulgaria. On the other hand, this will lead to a delay in their restructuring, since it requires significant investments.

The withdrawal of the banks from the companies with large emissions may have a rather negative impact on the green transition itself as well as on the banking system. One of the most important identified problems is that the financial institutions, in their quest to green the portfolio, find it easiest to refuse to finance emitting companies instead of doing what is the essence of the green transition, namely to support their restructuring. This, however, requires also new and large-scale expertise within the banks themselves, which takes time and resources, while meeting the goals to reduce the climate risks in the bank portfolios.

The study reveals the diverse experience of cooperation between banks and carbon-emitting companies: the banks exposed to more brown companies face more challenges.

## 6. CONCLUSION

This article presents the challenges the financial sector faces in the green transition. The literature review defines the complex task of how to carry out the green transition without harming economic growth and lowering living standards. In solving this theoretical and political task, a significant role has financial sector, which will encourage the transition by offering large-scale and flexible financing tools, especially for green projects. To realize the green transition, however, the financial sector should not abandon the companies with carbon emissions and focus only on alternative projects, but rather finance the projects for restructuring and reducing the emissions. This requires, particularly for countries like Bulgaria, that the transition be more gradual without shocks and hasty decisions, to preserve the economic and financial stability. Government interventions in limiting the CO<sub>2</sub> quota prices are suggested.

## References

- BAS. (n.d.). <https://www.iki.bas.bg/prehodat-kam-zelena-ikonomika-v-es-i-predizvikatelstva-pred-finansoviia-sektor-i-publichnite-finansi>
- Bobeva, D., Stoyanova, D., & Ignatov, I. (2021). Real Convergence and Green Transition. In: D. Bobeva & S. Raychev (Eds.), *Economic, Regional and Social Challenges in the Transition towards a Green Economy*. Conference proceedings, 30th of September 2021, Plovdiv, Bulgaria, Plovdiv University Press, ISBN (print): 978-619-7663-08-2, ISBN (online): 978-619-7663-07-5.
- Gorz, A. (1975). *Écologie et politique*. Galilée.
- Malthus, T. (1798). *An Essay on the Principle of Population*. London: J. Johnson.
- Mill, J. S. (1848). *Principles of Political Economy*. London: John W. Parker, West Strand.
- NGFS. (n.d.). <https://www.ngfs.net/en>





- Nordhaus, W. (2018). Projections and Uncertainties about Climate Change in an Era of Minimal Climate Policies. *American Economic Journal: Economic Policy*, 10(3), 333-60, DOI: 10.1257/pol.20170046.
- Regulation (EU) 2020/852 of the European Parliament and of the Council of 18 June 2020 on the establishment of a framework to facilitate sustainable investment, and amending Regulation (EU) 2019/2088.
- Stern, N., Stiglitz, J., & Taylor, C. (2021). The Economics of Immense Risk, Urgent Action and Radical Change: Towards New Approaches to the Economics of Climate Change. <https://doi.org/10.3386/w28472>
- Taleb, N, *The Black Swan: The Impact of the Highly Improbable*. New York: Random House and Penguin Books. 2007. ISBN 978-1-4000-6351-2. Expanded 2nd ed, 2010 ISBN 978-0812973815.
- Yergin, D. (2020). *The New Map: Energy, Climate, and the Clash of Nations*. Penguin Press, ISBN-10: 1594206430, ISBN-13: 978-1594206436.





# Risk Disclosures Related to Credit Derivative Use by U.S. and German Corporate Bond Funds between 2004 and 2010 – An Evaluation\*

Dominika P. Gałkiewicz<sup>1</sup> 

Received: June 21, 2023

Revised: October 25, 2023

Accepted: January 28, 2024

Published: March 16, 2024

## Keywords:

Fund;  
Derivative;  
Credit default swap;  
Reporting;  
Disclosure;  
Leverage



Creative Commons Non Commercial CC BY-NC: This article is distributed under the terms of the Creative Commons Attribution-Non-Commercial 4.0 License (<https://creativecommons.org/licenses/by-nc/4.0/>) which permits non-commercial use, reproduction and distribution of the work without further permission.

**Abstract:** *This study aims to investigate whether the comments made by funds regarding their use of CDS in periodic fund reports are consistent with their disclosed CDS holdings. For several funds in the U.S., the potential losses that may arise from selling CDS protection are almost as high as their net assets and in Germany, this potential can be even higher. The results of the study suggest that the comments provided by funds about their use of CDS in periodic reports are often vague and sometimes misleading. For instance, in Germany, funds that use more short than long CDS often claim that they only use long CDS for hedging purposes. This means that investors may need to analyze portfolio holdings to learn about the true investment behavior of funds. Based on the results, it is advisable for regulators in both countries to strengthen their monitoring activity and implement more standardized disclosure policies.*

## 1. INTRODUCTION

How accurate is the information funds provide to investors about their derivative use? During the global financial crisis of 2007-2009, many regulated market participants, including mutual funds, suffered significant losses due to their exposure to risky derivatives. Corporate bond funds in the United States and Germany that sold more credit default swaps (CDS) protection than they bought often suffered severe losses compared to those that predominantly bought CDS protection between 2004 and 2010 (Galkiewicz, 2016). This was due to the fact that CDS were used not only for hedging but also for implementing risky investment strategies, which could result in high returns or losses. For example, when a fund sells protection through CDS, it effectively increases its portfolio's leverage, as it is exposed to the notional amount of the swaps beyond its total net assets. The Oppenheimer Champion Income Fund almost collapsed in 2008 due to speculative investments in CDS and faced lawsuits<sup>2</sup> for insufficient disclosure.

The study examines the disclosure practices of mutual funds in both countries regarding their CDS investments during the 2007-2009 financial crisis period and around this time. The primary

\* Paper contains unpublished research presented in the working paper Galkiewicz, D. P., (2014b), Loss Potential and Disclosures Related to Credit Derivatives: A Cross-country Comparison of Corporate Bond Funds under US and German Regulation, SFB/TR 15 Discussion Paper, No. 494, Sonderforschungsbereich/Transregio 15 - Governance and the Efficiency of Economic Systems (GESY), München.

<sup>1</sup> Humboldt University Berlin, Germany; University of Applied Sciences Kufstein Tirol, Finance, Accounting & Auditing, Andreas Hofer-Str. 7, 6330 Kufstein, Austria

<sup>2</sup> See Recovering Oppenheimer Champion Fund Losses, <http://www.oppenheimerfundfraud.com/id3.html> and Oppenheimer Champion Income Fund Lawsuits, <http://www.youhavealawyer.com/blog/2009/04/16/oppenheimer-champion-income-fund-lawsuits>

objective of this analysis is to determine whether investors in the U.S. and Germany should be concerned about the possibility of mutual funds taking excessive risks through derivatives and misleading the public about their investments. Though mutual funds are subject to strict regulation in both countries, they can still engage in speculative strategies, such as selling CDS, which can undermine the effectiveness of the regulatory framework established to protect investors. In Europe, the study focuses on mutual funds that are distributed in Germany since they are regulated by EU-wide legislation<sup>3</sup> and have been authorized to use credit derivatives since 2004. The study aims to investigate the accuracy of the information provided by funds to investors regarding their CDS policies. Although there are numerous rules related to the use of derivatives, funds have a great deal of flexibility when developing their investment strategies under both U.S. and German regulations. According to Galkiewicz (2014a), U.S. and German funds can increase their derivative investments to the point where they might default solely due to derivatives. Therefore, losses incurred by the Oppenheimer Champion Income Fund in 2008, which were predominantly due to its CDS positions and amounted to almost 80% of its value, were within the existing regulatory limits on derivative use.

Given the high regulatory flexibility, it is interesting to empirically investigate the actual CDS holdings and disclosures of mutual funds. The 30 largest U.S. and German corporate bond funds (as determined by total net asset value (TNA) in 2004) included in the CRSP and BVI databases as they have the widest investor base were analyzed.<sup>4</sup> Annual and semi-annual U.S. filings are obtained from the SEC, while German reports are directly provided by the funds. From these reports, I collect data on the fund's net assets as well as the notional and market values of CDS.

In the following, section 2 provides the background on CDS strategies and related risk reporting literature, while section 3 describes the data and methodology. The discussion of the empirical results follows in section 4 and section 5 concludes the paper.

## 2. BACKGROUND ON CDS STRATEGIES AND LITERATURE

**CDS Strategies.** The CDS are a main representative of credit derivatives and can be viewed as default insurance on loans/bonds or as a speculative tool (Duffie, 1999; Oehmke & Zawadowski, 2017). Thus, from the viewpoint of investors, it is important to distinguish hedging strategies protecting the capital from non-hedging (i.e. investment or/and speculation) strategies potentially leading to large losses.

- **Hedging strategy:** having the underlying (e.g. bond) in the portfolio and buying CDS protection on it.
- **Investment strategy:** selling CDS protection and investing the notional amount into Treasuries allows to synthesize a bond or buying and selling CDS to close/offset existing CDS positions.
- **Speculative strategies** contain selling CDS protection without simultaneously increasing Treasuries (the latter creates a levered bond position that is riskier than a typical unlevered bond position and generates high implicit leverage at low costs/premium), using naked long CDS, negative basis trading, and credit market timing trading.

<sup>3</sup> German regulation is based on the UCITS Directive 85/611/EEC, which applies to all public investment funds in the EU.

<sup>4</sup> I thank Lehmann and Stehle (2013) for kindly providing me with the data on TNA for German funds.

Market participants buy as well as sell various types of CDS that can be classified as single- or multi-name CDS and these should be commented on in annual and semi-annual reports. The CDS market developed fast – from 2004 on when its market size was 6 trillion USD before it reached an impressive 58 trillion USD and finally arrived in 2020 at around 10 trillion USD.

**Literature.** The studies by Hodder et al. (2001), Beretta and Bozzolan (2004), and Lajili and Zeghal (2005), along with the latest CFA Reports (2011, 2013), reveal that the disclosure of risk by public companies is often unhelpful to shareholders due to the lack of consistency, clarity, and quantification. The quality of disclosures is not only determined by the quantity but also by the content. Horning and Grundl (2011) found that there are still significant variations in risk disclosure among insurers and cultures, while Malafronte et al. (2013) discovered that the annual reports of insurers are hard to comprehend. The SEC's letter to the General Counsel of the Investment Company Institute (SEC Letter to the GCotICI, 2010) highlights that there is a wide range of derivative disclosures, ranging from very brief to lengthy, highly technical descriptions that are of limited use to readers. Furthermore, the SEC emphasizes that funds' risks should be clarified concerning the respective derivative strategies. The descriptions often give an impression of high exposure that a fund does not actually face, and vice versa. For instance, the Oppenheimer Champion Income Fund was criticized by the public for its generic, boilerplate disclosure. Given the differences in disclosure regulations between both countries, the study compares annual and semi-annual fund reports' comments on applied CDS strategies with disclosed CDS holdings between 2004 and 2010 for the first time. Thus, the primary research question to answer is: Are the provided text comments on CDS use consistent with the disclosed CDS positions by mutual funds in the U.S. and Germany?

### 3. DATA AND METHODOLOGY

**Data.** It was investigated whether the potential risks associated with the use of CDS are properly reflected in the information provided to investors in the annual and semi-annual reports of the 30 largest funds in the U.S. and Germany (as measured by TNA on June 30, 2004) between 2004 and 2010 – Galkiewicz (2016) explains the sample in bigger detail. Generally, CDS use was extensive and increased over time for both U.S. and German funds between 2004 and 2010. It was observable that although less experienced in using CDS, German funds had higher and more varying CDS positions on the individual fund level since 2007. Especially noticeable is the fact that U.S. and German funds stayed net short and kept the highest levels of CDS selling protection during the global crisis. Finally, CDS-related risk reporting is observable 298 times:

- 19 out of the 30 U.S. funds report using CDS 192 times,
- 19 out of the 30 German funds report using CDS 106 times.

**Methodological Approach.** First, the level of short CDS use reflecting the potential for realizing losses via CDS for U.S. and German corporate bond funds under current regulation was analyzed. Second, the information funds provide to investors about their CDS policies in both countries was analyzed. All U.S. funds are required to comment on their holding positions (mandatory reporting), while EU/German funds voluntarily comment on their CDS strategies.

### 4. RESULTS

**The Nature of CDS-Related Comments Disclosed by U.S. Funds.** US funds are required to provide details on their holding positions, including derivative positions, in the notes section of their reports. A majority of funds (12 out of 19) that use CDS did not regularly indicate the

use of derivatives and associated risks in the section of the report that contains a short discussion of fund performance. However, for the purpose of this study, the focus will be only on the comments on CDS use in the report notes. From 2004 to 2007, the notes were shorter than from 2008 to 2010. During this period, funds always provided a short technical definition of CDS, some comments on valuation (mark to market), and brief remarks on the strategies behind CDS use. Starting in 2008, the notes became more informative with more explanatory notes on the technical functioning of different CDS types and various risks associated with CDS use. Additionally, the notes often provided more detailed information regarding a fund's CDS strategies, the amount at risk, and triggering events. This change was due to an amendment to the [FASB 133](#)<sup>5</sup> which requires more extensive disclosure. The amendment requires funds to state the nature and terms of derivatives, give reasons for entering into those instruments, specify events that require the seller to perform under a contract and describe the current status of the payment and performance risk with regard to the contract. Moreover, funds must post information about the highest potential amount that the fund could be liable for as a contract seller, the fair value of the contract, and the nature of any recourse provisions or assets held either as collateral or by third parties.

In section 2, we discussed how funds use long CDS and short CDS for various purposes. These purposes go beyond offsetting existing long CDS positions. Funds may use CDS selling protection to gain exposure to risk by timing credit markets and creating levered or unlevered bond positions. Additionally, they may use CDS buying protection to perform negative basis trades or to time credit markets. All 19 funds that use CDS commented on their holdings in 192 half-years, and these comments were in line with their disclosed CDS holdings. Almost all of the funds stated that they entered into CDS contracts to buy or sell protection on an underlying position – this general comment formulation justifies every CDS strategy applied by a fund for any purpose. However, they rarely made concrete and specific statements about their CDS-related strategies. In particular, the 13 funds that did not have long CDS, i.e., they pursued short CDS strategies for non-hedging purposes, stated to buy and sell CDS for a wider range of purposes in 53 out of 192 half-years (not reported). Only two funds were stated and actually only used short CDS in 17 half-years. Surprisingly, while not having short CDS, i.e., pursuing long CDS strategies, 4 out of the 19 funds that used CDS stated to buy and sell CDS for a wider range of purposes in 7 out of 192 half-years. Only one fund stated and actually only used long CDS in 2 half-years. The CDS comments of funds belonging to one fund family, such as PIMCO, Fidelity, and Vanguard, were close to identical. The SEC has observed that comments are often prepared for a particular fund family and not for a specific fund ([SEC Letter to the GCotICI, 2010](#)). Thus, US funds could have been more specific about their CDS strategies in 60 out of 192 half-years. The findings indicate that funds only pursuing short CDS strategies, which are associated with non-hedging activities, give the impression of using long and short CDS for a wider range of purposes. However, it remains unclear whether they do this intentionally or unintentionally.

As mentioned before, the amount of information provided in the notes has increased since 2008. For instance, both PIMCO and Vanguard funds increased the content of their notes in 2008. This is mainly because of the inclusion of more explanatory notes on the technicalities of

<sup>5</sup> See FASB Staff Position No. FAS 133-1 and FIN 45-4, “Disclosures about Credit Derivatives and Certain Guarantees: An Amendment of FASB Statement No. 133 and FASB Interpretation No. 45.” The amendment extends the interpretation of FASB Statement No. 133 (“FAS 133”), “Accounting for Derivative Instruments and Hedging Activities”, and the FASB Interpretation No. 45 (“FIN 45”), “Guarantor’s Accounting and Disclosure Requirements for Guarantees, Including Indirect Guarantees of Indebtedness of Others.” See [FASB, 2009](#).

different types of CDS (such as those based on corporate or sovereign bonds, indices, and asset-backed securities) and on the fund's CDS strategies. Unfortunately, there are no new insights provided regarding the strategic use of CDS, which was previously criticized by the SEC. Furthermore, it is often directly or indirectly stated that CDS are priced according to the mark-to-market standard, although the potential obligations amount to the notional value for sold CDS. Funds can mention this information in the footnotes of the respective portfolio holdings or the notes, without necessarily giving the overall notional amount of short CDS. For example, Fidelity funds have mentioned since 2009 that the notional amount describes the highest potential loss that can occur due to sold CDS, and they also provide an absolute amount and a fraction of the net asset value put at risk during a specific period. The figures were consistent with disclosed CDS notional amounts observed in the data. Since the second half of 2009, Fidelity funds have also given the exact amount of net collateral pledged, as well as the amount that should be paid beyond that point (assuming all contracts are triggered). This last piece of information is only provided by some funds within the notes, while other funds usually mention the amount of collateral pledged for the respective positions in the footnotes of the holdings.

Based on previous analyses, it seems that fund comments could be improved for the benefit of investors. For instance, it would be useful for funds to provide information about derivative use and its potential consequences within the performance discussion at the beginning of reports, in addition to the notes section. Standardizing and reducing the extensive CDS related comments, such as those regarding the details of the functioning of CDS from contract initiation to termination, could also prove beneficial. Investors would benefit from avoiding the use of vague statements about a fund's CDS-related strategies. For example, funds only pursuing short CDS strategies (for non-hedging purposes) often – intentionally or unintentionally – report to use of long and short CDS for a wider range of purposes. Additionally, including the highest aggregate notional amount that could be due in a specific period due to sold CDS (as a fraction of the TNA), as well as the precise amount of net collateral pledged and additional necessary payments if all contracts are triggered within the notes, could help potential investors. The existence and mandatory application of a compact and standardized template for CDS-related text, which incorporates the aforementioned features that are partially required by law, could increase understanding and the value of information for investors.

Altogether, these results confirm many former SEC findings ([SEC Letter to the GCotICI, 2010](#)) with regard to the lengthy, highly technical, and unspecific disclosure policies of mutual funds. They further highlight that the disclosures of U.S. funds and public companies (e.g., [Beretta & Bozzolan, 2004](#); [Lajili & Zeghal, 2005](#); [CFA, 2011, 2013](#)) similarly lack uniformity, clarity, and over-emphasize quantity over quality of reporting. Although there is a lot of information given, the value of this information for the reader should be evaluated by further research and regulators.

**The Nature of CDS Related Comments Disclosed by German Funds.** German funds' public reports provide basic information about their investment strategies during specific periods. Occasionally, they mention whether they use CDS for "hedging" and/or "investment purposes" such as synthesizing a bond or speculation. Investors require truthful information about funds that voluntarily comment on their CDS holdings. In the sample of German funds, only 9 out of 19 that used CDS directly commented on CDS use in 25 out of 106 half-years (23.58%). The number of funds commenting on CDS use increased from one fund in the second half of 2006 to six funds in 2010. Four funds that used CDS claim that they never used credit derivatives. During the reporting period, German funds that commented on CDS use had higher CDS

holdings than funds that did not comment on CDS. As a result, these funds provided more information to investors who were more exposed to risk. However, it was found that their comments were not always consistent with their disclosed CDS holdings. Out of 9 funds, 3 funds suggested hedging with CDS in 8 out of 25 (32%) half-years, while pursuing both long and short CDS strategies for a wider range of purposes. In all of these cases, short CDS positions were always high and, in 6 cases, significantly outweighed long CDS positions at the respective period ends (Galkiewicz, 2014b). This indicates a heightened fund exposure to risk, whereas the funds reported to hedge with CDS. It is possible that these funds intentionally misled investors. Upon further analysis of the comments around the highlighted periods, it was found that they differed from those identified as misleading statements. Although these 3 funds stopped commenting on CDS use, they did not stop using CDS. Two of the 3 funds also used CDS before they started to comment on them.

By contrast, U.S. funds that did not use long CDS often reported buying and selling CDS for a wider range of purposes in 53 out of 192 half-years. In Germany, only 2 out of the 9 funds that did not use long CDS stated to buy and sell CDS for a wider range of purposes in 2 out of 25 half-years. For funds that did not have short CDS, i.e., pursued long CDS strategies, 2 out of 9 stated to buy and sell CDS in 3 out of 25 half-years for a wider range of purposes (in the U.S., in 7 out of 192 half-years). Moreover, one fund stated to only use short CDS associated with non-hedging purposes even though it used long CDS positions for 2 half-years (only one fund stated and actually used long CDS in 2 half-years).

Overall, German funds have made 8 misleading statements and have been less specific about their CDS strategies in an additional 7 cases. In comparison, in the US, unspecific comments occurred in 60 out of 192 half-years. The comments in the extended prospectuses, and terms of the contract, were either very general or strictly followed the wording of the law. Based on the report's comments on derivatives, investors would have only guessed about the way funds distributed in Germany used financial instruments during this period. Therefore, proposals for improvements to US fund disclosure policies should be considered by regulators for EU-wide fund disclosure policies. Although different levels of transparency with respect to the information provided to investors are observable in both countries, analyses performed for US and German corporate bond funds show the high level of flexibility that funds have when commenting on their derivative strategies, which may misguide investors.

## 5. CONCLUSION

This study compares the level of potential losses from CDS holdings at U.S. and German corporate bond funds together with the CDS-related disclosures around the financial crisis of 2007-2009 under the regulation existing at that time. The investigation focuses on assessing whether the potential risks associated with the use of CDS are accurately disclosed to investors in the annual and semi-annual reports of investment funds in the United States and Germany. The main objective is to determine if investors need to be concerned about the possibility of funds taking excessive risks through the use of CDS and providing misleading information about their CDS policies. Investors need to carefully scrutinize the portfolio holdings of funds in order to understand their true investment behavior. This is because the comments made in connection to CDS are frequently vague and sometimes misleading. For example, in Germany, funds that sold more CDS protection than they purchased often claimed to have bought CDS for hedging purposes only. To protect the interests of investors worldwide, particularly those who are less



experienced, it is recommended that U.S. and German/EU regulators conduct more thorough monitoring of the disclosure methods employed by mutual funds. To minimize potential negative effects on investors, as seen during the financial crisis, it is advisable for regulators in both countries to tighten the rules on the speculative use of derivatives by funds to an appropriate level, and to introduce more standardized disclosure policies. These findings have significant importance for both regulators and investors. Further research on mutual funds' portfolio holdings is needed to evaluate the adequacy of reporting.

### Acknowledgment

The author gratefully acknowledges financial support from the Deutsche Forschungsgemeinschaft (German Science Foundation) through SFB 649 "Economic Risk" and SFB-TR15 "Governance and the Efficiency Economic Systems".

### References

- Beretta, S., & Bozzolan, S. (2004). A framework for the analysis of firm risk communication. *The International Journal of Accounting*, 39(3), 265-288. <https://doi.org/10.1016/j.intacc.2004.06.006>
- CFA. (2011). User Perspectives on Financial Instrument Risk Disclosures under International Financial Reporting Standards (IFRS) (Volume 1), October. [http://www.cfainstitute.org/ethics/documents/financial\\_instruments\\_risk\\_disclosure\\_report\\_volume\\_1.pdf](http://www.cfainstitute.org/ethics/documents/financial_instruments_risk_disclosure_report_volume_1.pdf)
- CFA. (2013). User Perspectives on Financial Instrument Risk Disclosures under International Financial Reporting Standards: Derivatives and Hedging Activities Disclosures (Volume 2), January.
- Duffie, D. (1999). Credit Swap Valuation. *Financial Analysts Journal*, 55(1), 73-87. <https://doi.org/10.2469/faj.v55.n1.2243>
- FASB. (2009). ASC 815-10: Derivatives and Hedging ("Topic 815").
- Galkiewicz, D. P. (2014a). Similarities and Differences between U.S. and German Regulation of the Use of Derivatives and Leverage by Mutual Funds – What Can Regulators Learn from Each Other? Working Paper.
- Galkiewicz, D. P. (2014b). Loss Potential and Disclosures Related to Credit Derivatives: A Cross-country Comparison of Corporate Bond Funds under US and German Regulation. SFB/TR 15 Discussion Paper, No. 494, Sonderforschungsbereich/Transregio 15 - Governance and the Efficiency of Economic Systems (GESY), München.
- Galkiewicz, D. P. (2016). Loss Potential from Credit Derivative Use by Corporate Bond Funds under U.S. and German Regulation – A Cross Country Comparison. *Credit and Capital Markets – Kredit und Kapital*, 49(2), 245-298.
- Hodder, L., Koonce, L., & McAnally, M. L. (2001). SEC Market Risk Disclosures: Implications for Judgment and Decision Making. *Accounting Horizons*, 15(1), 49-70. <https://doi.org/10.2308/acch.2001.15.1.49>
- Horing, D., & Grundl, H. (2011). Investigating Risk Disclosure Practices in the European Insurance Industry. *The Geneva Papers on Risk and Insurance - Issues and Practice*, 36(3), 380-413. <https://doi.org/10.1057/gpp.2011.13>
- Lajili, K., & Zeghal, D. (2005). A Content Analysis of Risk Management Disclosures in Canadian Annual Reports. *Canadian Journal of Administrative Sciences / Revue Canadienne des Sciences de l'Administration*, 22(2), 125-142. <https://doi.org/10.1111/j.1936-4490.2005.tb00714.x>

- Malafrente, I., Porzio, C., & Starita, M. G. (2013). Disclosure Practices and Financial Crisis: Empirical Evidences in the European Insurance Industry. SSRN Electronic Journal. <https://doi.org/10.2139/ssrn.2374688>
- Oehmke, M., & Zawadowski, A. (2017). The Anatomy of the CDS Market. *Review of Financial Studies*, 30(1), 80-119. <https://doi.org/10.1093/rfs/hhw068>
- Oppenheimer Champion Income Fund Lawsuits. <http://www.youhavealawyer.com/blog/2009/04/16/oppenheimer-champion-income-fund-lawsuits/>, visited on September 8, 2012.
- Recovering Oppenheimer Champion Fund Losses, <http://www.oppenheimerfundfraud.com/id3.html>, visited on September 8, 2012.
- SEC Letter to the GCotICI. (2010). SEC, Letter to the General Counsel of the Investment Company Institute: Derivatives-Related Disclosures by Investment Companies.
- UCITS Directive 2009/65/EC/OGAW-Richtlinie 2009/65/EG: Richtlinie zur Koordinierung der Rechts und Verwaltungsvorschriften betreffend bestimmte Organismen für gemeinsame Anlagen in Wertpapieren (OGAW) (Neufassung), i.d.F. vom 13. Juli 2009, Amtsblatt der Europäischen Union L302/32-302/96.



# Internal Audit as a Quality Assurance Instrument: A Case Study from Garment Manufacturing Enterprises in the Western Balkan Region

Jolta Kacani<sup>1</sup>   
Sajmira Kopani<sup>2</sup> 

Received: August 30, 2023  
Accepted: November 2, 2023  
Published: March 16, 2024

## Keywords:

Internal audit;  
Control environment;  
Circular garments;  
Quality standards



Creative Commons Non-Commercial CC BY-NC: This article is distributed under the terms of the Creative Commons Attribution-Non-Commercial 4.0 License (<https://creativecommons.org/licenses/by-nc/4.0/>) which permits non-commercial use, reproduction and distribution of the work without further permission.

**Abstract:** *The European Strategy for Sustainable and Circular Textiles (2022) aims to ensure that by 2030 garments have a longer life, are made as much as possible from recyclable material, and are free of harmful substances. For garment producers, this means compliance with mandatory requirements along the value chain focusing on the entire lifecycle of garments, while supporting the green and digital transitions within the industry ecosystem. Compliance with the new environmentally friendly standards required for garment exports in the European markets demands an improved control environment and consolidated internal audit procedures within manufacturing enterprises. The objective of this paper is to evaluate the effectiveness of the current internal audit procedures in garment manufacturing enterprises located in the Western Balkan region and exporting to end customers in the European market and other international markets. In doing so this paper analyses a sample of thirty enterprises according to 5Cs elements of internal audit. The 5Cs in the internal audit include the criteria, conditions, causes, consequences, and corrective actions within the sample of the enterprises. Based on 5Cs elements new improvements in the standard operating internal audit procedures in garment manufacturing enterprises are proposed in line with new European strategies.*

## 1. INTRODUCTION

The garment industry is one of the main drivers of the European economy, which is expected to grow in the future due to flexible prices which encourage customers in the European market to purchase large quantities of garments. However, garment manufacturing significantly impacts the environment due to excess consumption, a trend created by fast fashion and dangerous chemicals used in the production and dyeing of fabrics (McNeill & Snowdon, 2019). Most customers in the European market possess a spending behavior by purchasing more than they need and regard low-priced garments as fully disposable. The cheap garments are usually disposed of after just seven or eight wears as they are no longer fashionable, their appearance fades, and their durability diminishes. A major adverse consequence of this purchasing behavior is that opportunities for the reuse and recycling of cheap garments at the end of their cycle are low (Camacho-Otero et al., 2020).

In its current state, the garment industry brings major concerns regarding sustainability and circularity. Most raw materials (fibers and clothing) are damaging to the environment with fast fashion speeds up the rate at which garments harm the environment. Manufacturing of fibers is mostly based on non-biodegradable synthetic fibers, with few opportunities for recycling and reuse due to their complex chemical structures (Ferro et al., 2019). In addition, the garment industry severely suffers from water consumption and pollution especially for and from textile wet processing operations of dyeing, finishing, and sizing generating significant issues of concern regarding sustainability in the garment industry (Heinze, 2020).

<sup>1</sup> University of Tirana, Faculty of Economy, Tirana, Albania

<sup>2</sup> University of Public Service, International and European Studies, Budapest, Hungary

Under such circumstances, the transition into green manufacturing processes requires rigorous monitoring of the entire process starting with the selection of raw materials, design, production, distribution, and waste management resulting in extensive costly investments, a challenge for most enterprises in the industry. The rate and the degree of transition to a circular manufacturing model in the garment industry will depend on the knowledge, awareness and engagement of all parties involved in the global value chain of the industry (Prieto-Sandoval et al., 2018). In the transition phase, the 4Rs (reducing, reusing, repairing, and recycling) principles need to be applied throughout the whole cycle of garments including all stages in manufacturing, consumption and return of resources. Application of the 4Rs principles generates a major challenge in the garment industry as it requires simultaneously reduction in the use of raw materials, minimization in the quantity of toxic substances, maximization in the use of renewable resources, and augmentation in garment durability (Chae & Hinestroza, 2020).

Implementation of the 4Rs principles intends to prevent the generation of waste throughout the garment life cycle with a significant reduction in the waste that ends up in the landfills of the industry. Waste management at all levels is a new approach to modifying the ways garments are designed, produced, and consumed (Jia et al., 2020). Effective waste management based on the proper application of all 4Rs generates a reduction in the use of raw materials, reusing of textiles, and recycling of clothing. However, effective waste management mostly depends on the initial phases of product design and development. Within these new dimensions embracing sustainable and circular processes requires maximum use of resources with little or no waste, with zero emissions, without harming the environment while generating profits in the industry (Zhang et al., 2021).

## 2. SUSTAINABLE AND CIRCULAR GARMENTS IN THE EUROPEAN UNION

It is estimated that garment consumption within the European Union ranks among the four industries with the most impact on the environment and climate change. The garment industry is also among the three industries for the usage of water and land use in the European market. Given the substantial impact the garment industry has on environmental and resource consumption, the European Union drafted a new Strategy for Sustainable and Circular Textiles (European Commission, 2022). This strategy introduces a detailed action plan and the necessary steps so that by 2030 garments sold in the European market are mainly manufactured from organic or recycled fibers and are free from hazardous materials respecting both social and environmental rights (Juanga-Labayen et al., 2022).

This strategy also introduces across the value chain of the garment industry new processes related to the circular economy including reuse and repair. This strategy intends to make manufacturers responsible for waste management and recycling of garments throughout the entire life cycle of garments. These new responsibilities for manufacturers aim to promote an ecosystem in the garment industry that strongly favors the use of circular processes and materials, significantly reducing activities in corresponding landfills (Ikram et al., 2021).

The European Strategy for Sustainable and Circular Textiles introduces a new vision for garments placed by 2030 in the market to be long-lived and recyclable made with high-quality fibers so that fast fashion is no longer the most dominant trend in the industry. This way consumers will enjoy high-quality textiles for longer, while fast fashion becomes less popular. As such, the strategy requires garment enterprises to reduce the number of collections introduced every

year to minimize environmental footprints and stimulates member states to take on board favorable advantageous taxation measures for enterprises engaged in the reuse and repair sector (Sikander et al., 2021).

The strategy introduces several measures to promote sustainable and circular garments including among others ecodesign requirements, which make garments last longer and are easier to repair and recycle. However, to comply with eco-design principles garment manufacturing enterprises need to make additional investments in innovative technologies, acquire new knowledge, and train employees to meet the predetermined requirements, potentially leading to increased costs (Saha et al., 2021).

Another measure is the introduction of the digital product passport for garments in the European Union. This digital passport will include the necessary information on circularity ensuring that customers are aware of the environmental impact of their purchases (energy use, recycled content, presence of substances of concern, durability, reparability, etc.). Also, for the implementation of digital passports, garment manufacturing enterprises are required to make new investments in technology and train their employees, resulting in additional manufacturing costs (Vazquez-Brust & Plaza-Ubeda, 2021). Given the new demanding requirements introduced in the new Strategy for Sustainable and Circular Textiles, internal audits in garment manufacturing enterprises become a key instrument in compliance with strategy requirements (Juanga-Labayen et al., 2022).

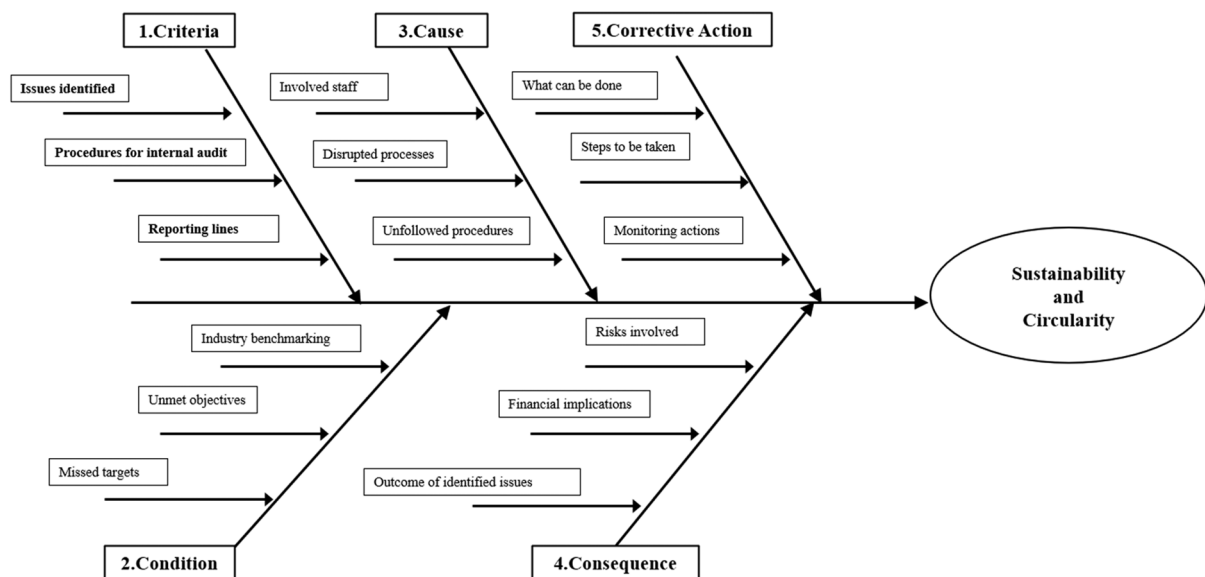
### 3. INTERNAL AUDIT IN GARMENT ENTERPRISES

Internal audit is an essential instrument that garment manufacturing enterprises have in developing resource efficiency capacities and improving operational abilities. Internal audit affects the overall performance of the enterprise as resource efficiency is achieved by complying with standard operating procedures, international standards in garment manufacturing, and EU regulations that dominate the global value chain of the industry (Chang et al., 2019). This compliance leads to better integration in international markets and long-term growth. In addition, an internal audit is one of the most effective tools for higher transparency to all relevant shareholders and stakeholders to get accurate information on the performance indicators of garment manufacturing enterprises and their path toward sustainable and circular end products (Christ et al., 2021).

Internal audit assists the management in managing risks, restructuring manufacturing processes, making strategic decisions, and objectively evaluating the financial performance of the enterprise. The findings of the internal audit reports serve as a good basis for the management to make a sound judgment on the innovation opportunities most suitable for the enterprise attaining this way sustainability and circularity in garment manufacturing (Dahlbo et al., 2017). According to the literature, one of the most effective ways to prepare an internal audit is evaluation based on five priority areas that include: (i) criteria, (ii) conditions, (iii) causes, (iv) consequences, and (v) corrective actions, alternatively referred to 5Cs (Turetken et al., 2019). More specifically, the 5Cs in internal audit are introduced below:

1. **Criteria:** Refers to reasons for having an internal audit, the parties requesting the internal audit, and how it will help with the external audit.
2. **Conditions:** Refer to any objectives, targets, standards, or expectations that are not met due to the issues identified in the first step.

3. **Causes:** Refer to a detailed analysis of what causes the issues the enterprise is having, including all steps involved in the manufacturing of finished garments or administration of the enterprise.
4. **Consequences:** Refers to the outcome of issues previously identified, the risks, and the financial implications related to the issues in the enterprise.
5. **Corrective Actions:** Refers to the actions the enterprise needs to take to eliminate the issues identified and establish a monitoring system so that they do not recur. The fishbone diagram in Figure 1, explains in detail the 5Cs of internal audit.



**Figure 1.** Introducing the 5Cs of internal audit.

Source: Authors

#### 4. METHODOLOGY

This paper examines in detail the internal audit procedures of twelve enterprises from Western Balkan countries <sup>3</sup> (Kacani et al., 2022). mostly based on detailed interviews with high-level managers (administrators, head of quality assurance, head of logistics, head of finance, and head of maintenance). Additional interviews included middle-level managers mostly focused on line supervisors and technicians. In total thirty-six interviews were finalized which included both closed and open questions to understand the dynamics of internal audit in attaining sustainability and circularity within garment manufacturing enterprises (Kacani, 2017).

The questions were drafted based on four main priority areas including (i) sustainability reporting, (ii) diversification of raw materials, (iii) eco-design of end products, and (iv) implementation of circular processes which are also included in the European Union Strategy for Sustainable and Circular Textiles. Questions in the interview intended to identify both conventional and original solutions of circular and green garments applied in enterprises under consideration. Conventional solutions refer to mechanical and thermal processes like shredding of textile materials, weaving of shredded materials, and spinning of fibrous materials. On the other hand, original solutions consist of end products made entirely of biodegradable materials such as bioplastic, recycled plastic, recycled leather, and textile scraps, etc (Kacani, 2020).

<sup>3</sup> The sample size has twelve enterprises from the Western Balkans.

In addition, the paper is based on purposeful sampling. When determining the sample composition, several criteria were used to select the twelve enterprises (Corovic et al., 2020). Among the criteria used are the following: (i) turnover of over 5 million /EUR, (ii) operation mode under the provision of full package services, (iii) having over three hundred employees, (iv) having at least three major international brands as their customers, (v) exports in the European, preferably also in the American, and Asian markets, (vi) the percentage of recyclable raw materials used in the manufacturing of products, (vii) and at least one major investment for the use of renewable energy sources in manufacturing (Kacani et al., 2022; Zamani et al., 2018). Selection of enterprises is based on these criteria as only large garment manufacturing enterprises have an internal audit unit, subject to this paper. Responses received during the interview were analyzed according to the 5C introduced in the previous section. A summary of the main findings is presented in Table 1.

**Table 1.** Main finding on internal audit procedures in garment manufacturing enterprises

No.	Main Topic	Priority Areas	Evaluation according to 5C
1.	<b>Reporting on sustainability</b>	<ul style="list-style-type: none"> <li>Preparation of a yearly sustainability report.</li> <li>Assessment of economic, environmental, and social performance of the enterprise.</li> <li>Reporting to enterprise stakeholders.</li> <li>Application of Sustainability Accounting Standards (SAS).</li> </ul>	<p><b>1. Criteria</b> Enterprises in the sample size do not prepare an annual sustainability report. Such a requirement is not included in the internal control procedures. No reporting is made to stakeholders.</p> <p><b>2. Conditions</b> Enterprises receive basic information on industry benchmarking for sustainability through their main clients yearly. Sustainability practices are partially applied.</p> <p><b>3. Causes</b> Enterprises depend mostly on practices applied by their clients and are not autonomous in developing their practices. Exceptions are enterprises that have their brand.</p> <p><b>4. Consequences</b> Financial implications are not high to prepare a sustainability report and risks are low if the right procedure is in place.</p> <p><b>5. Corrective actions</b> Enterprises can prepare a detailed action plan to draft a sustainability report for their brand, as they do have the autonomy to do so.</p>
2.	<b>Diversification of raw materials</b>	<ul style="list-style-type: none"> <li>Application of green procurement rules.</li> <li>Clear written procedures for the selection of suppliers of raw materials.</li> <li>Use of recyclable raw materials in end products.</li> <li>Use of biodegradable materials.</li> <li>Internal laboratory for testing of raw materials.</li> <li>Application of Global Organic Textile Standards (GOTS).</li> </ul>	<p><b>1. Criteria</b> Enterprises have standardized procurement procedures, most of which are not fully compliant with green procurement rules. On average 35% of all raw materials are recyclable or biodegradable. All enterprises have a testing laboratory for raw materials.</p> <p><b>2. Conditions</b> Enterprises receive basic information on industry benchmarking for sustainability through their main clients yearly. Those with their brand have made small steps toward the adoption of GOTS.</p> <p><b>3. Causes</b> Enterprises depend mostly on practices applied by their clients and are not autonomous in developing their practices. Clients have a predetermined list of suppliers and technical specifications for raw materials. Exceptions are enterprises that have their brand.</p> <p><b>4. Consequences</b> Financial implications are not high enough to prepare guidelines for green procurement. It can be outsourced to external experts. Risks are low especially after the guidelines are in place. Financial implications for GOTS implementation are higher.</p> <p><b>5. Corrective actions</b> Preparation of green procurement guidelines and organizing processes to prepare for GOTS implementation.</p>

3.	<b>Eco-design of end products</b>	<ul style="list-style-type: none"> <li>• Use of renewable resources in manufacturing.</li> <li>• Use of fewer resources in the manufacturing of end products.</li> <li>• Trained personnel for introducing eco-design in manufacturing.</li> <li>• Utilization of green technologies in manufacturing.</li> </ul>	<p><b>1. Criteria</b> Eco-design criteria are only present in seven enterprises that are designed by main clients to conduct design processes. They have trained staff and have acquired green technology. All enterprises operate fully or partially based on renewable energy sources.</p> <p><b>2. Conditions</b> Enterprises with a design unit receive information on industry benchmarking for eco-design. The rest of the enterprises are only basically informed on eco-design requirements.</p> <p><b>3. Causes</b> Enterprises depend mostly on practices applied by their clients and are not autonomous in developing their practices. Even though autonomy exists for enterprises with their brand, eco-design practices are missing.</p> <p><b>4. Consequences</b> Financial implications are not high enough to prepare guidelines for eco-design. It can be outsourced to external experts. Risks are low especially after the guidelines are in place. Financial implications for the acquisition of green technology are high.</p> <p><b>5. Corrective actions</b> Preparation of eco-design guidelines for own brand and technical specifications for green technologies.</p>
4.	<b>Implementation of circular processes</b>	<ul style="list-style-type: none"> <li>• Application of Global Recycle Standards (GRS).</li> <li>• The existence of standard operating procedures for 4Rs (reducing, reusing, repairing, and recycling).</li> <li>• Waste management to reduce environmental footprint.</li> </ul>	<p><b>1. Criteria</b> All enterprises do not apply GRS in manufacturing. At the same time, standard operating procedures for 4Rs in circular processes are missing. Circular processes are only present for waste management mainly through outsourcing services.</p> <p><b>2. Conditions</b> Enterprises receive basic information on industry benchmarking for waste management through their main clients yearly. Waste management practices are not applied internally, only outsourced.</p> <p><b>3. Causes</b> Enterprises depend mostly on practices applied by their clients and are not autonomous in developing their practices. This also includes enterprises that have their brand.</p> <p><b>4. Consequences</b> The financial implications of internalizing circular processes are high and enterprises in the sample do not have the financial means to do so even for their brand.</p> <p><b>5. Corrective actions</b> Enterprises can start by acquiring new knowledge on circular processes and by creating a dedicated team that will smooth the transition to circular processes.</p>

Source: Authors

## 5. FUTURE RESEARCH DIRECTIONS

Research on the sustainability and circularity of garment manufacturing enterprises is still at a very early stage, mostly attributed to the developing characteristics of the Western Balkan region and their lack of membership in the European Union. The market economy in the region is primarily based on enterprises that lack the necessary organizational structures of European enterprises. As such multiple research areas arise including uncertainties in the circular value chains of the garment industry, risk assessments in improving waste management along production lines, knowledge transfer models to develop 4R practices, etc.



## 6. CONCLUSION

Garment manufacturing enterprises in the Western Balkan countries possess only basic internal audit capacities which are limited to responsibilities assigned by their main clients. Despite that, the purposeful sampling in this paper with criteria oriented toward established garment manufacturing enterprises in the Western Balkan region, internal audit abilities toward sustainability and circularity are still at the early stages. In their current state, garment manufacturing enterprises with their brand have little knowledge of the requirements of the European Strategy for Sustainable and Circular Textiles and on how to introduce circular practices in the industry. They have sporadically made investments in new technology; however, these are not coordinated throughout all manufacturing stages from the selection of raw materials to the delivery of ready-to-wear garments to end customers. As a result, these measures only partially affect overall circularity in manufacturing. An exception is investments in renewable energy sources which all enterprises agree are largely beneficial both in terms of diversification of resources but also in cost cutting. A similar diversification is very limited in the selection of raw materials, with a minor share in fully eco-friendly and fully biodegradable materials.

Despite the minor progress made so far toward sustainability and circularity in garment manufacturing, enterprises in the Western Balkan region have an unexploited potential to master green and environmental practices in the industry. In all enterprises, the management is willing to strengthen their internal audit capabilities by acquiring more knowledge on the implementation of the 4Rs, undertaking additional steps like procuring more green raw materials, applying eco design principles for their brand, drafting the first sustainable reports, while preparing for implementation of GRS and GOTS standards.

## References

- Camacho-Otero, J., Pettersen, I. N., & Boks, C. (2020). Consumer engagement in the circular economy: Exploring clothes swapping in emerging economies from a social practice perspective. *Sustainable Development*, 28(1), 279-293. <https://doi.org/10.1002/sd.2002>
- Chae, Y., & Hinestroza, J. (2020). Building circular economy for smart textiles, smart clothing, and future wearables. *Materials Circular Economy*, 2(2). <https://doi.org/10.1007/s42824-020-00002-2>
- Chang, Y.-T., Chen, H., Cheng, R. K., & Chi, W. (2019). The impact of internal audits is attributed to the effectiveness of internal control over operations and compliance. *Journal of Contemporary Accounting & Economics*, 15(1), 1–19. <https://doi.org/10.1016/j.jcae.2018.11.002>
- Christ, M. H., Eulerich, M., Krane, R., & Wood, D. A. (2021). New Frontiers for Internal Audit Research. *Accounting Perspectives*, 20(4), 449–475. <https://doi.org/10.1111/1911-3838.12272>
- Corovic, E., Gligorijevic, Z., & Kostadinovic, I. (2020). Export competitiveness of textile and clothes of Western Balkan Countries. *Fibres & Textiles in Eastern Europe*, 28(4), .8-14. doi: 10.5604/01.3001.0014.092
- Dahlbo, H., Aalto, K., Eskelinen, H., & Salmenperä, H. (2017). Increasing textile circulation consequences and requirements. *Sustainable Production and Consumption*, 9, 44-57. <https://doi.org/10.1016/j.spc.2016.06.005>
- European Commission. (2022). Strategy for Sustainable and Circular Textiles, dated 30.03.2022. <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52022DC0141>
- Ferro, C., Padin, C., Svensson, G., Høgevold, N., & Sosa Varela, J. C. (2019). Validating and expanding a framework of a triple bottom line dominant logic for business sustainability

- through time and across contexts. *Journal of Business & Industrial Marketing*, 34(1), 95-116. <https://doi.org/10.1108/JBIM-07-2017-0181>
- Heinze, L. (2020). Fashion with heart: sustainable fashion entrepreneurs, emotional labour and implications for a sustainable fashion system. *Sustainable Development*, 28, 1554–1563. <https://doi.org/10.1002/sd.2104>
- Ikram, M., Ferasso, M., Sroufe, R., & Zhang, Q. (2021). Assessing green technology indicators for cleaner production and sustainable investments in a developing country context. *Journal of Cleaner Production*, 322, 129090. doi:10.1016/J.JCLEPRO.2021.129090
- Jia, F., Yin, S., Chen, L., & Chen, X. (2020). The circular economy in the textile and apparel industry: a systematic literature review. *Journal of Cleaner Production*, 259, 120728. <https://doi.org/10.1016/j.jclepro.2020.120728>
- Juanga-Labayen, J. P., Labayen, I. V., & Yuan, Q. (2022). A review on textile recycling practices and challenges. *Textiles*, 2, 174–188. <https://doi.org/10.3390/textiles2010010>
- Kacani, J. (2017). Towards knowledge-based flexibility for manufacturing enterprises: with a case study. *International Journal of Intelligent Enterprise*, 4 (3), 204 – 226. <https://dx.doi.org/10.1504/IJIE.2017.087626>
- Kacani, J. (2020). *A Data-Centric Approach to Breaking the FDI Trap Through Integration in Global Value Chains*, 1 st. ed. Switzerland, Springer.
- Kacani, J., Mukli, L., & Hysaj, E. (2022). A framework for short- vs. long-term risk indicators for outsourcing potential for enterprises participating in global value chains: Evidence from Western Balkan countries. *Journal of Risk and Financial Management*, 15(9), 401. <https://doi.org/10.3390/jrfm15090401>
- McNeill, L. S., & Snowdon, J. (2019). Slow fashion—balancing the conscious retail model within the fashion marketplace. *Australasian Marketing Journal*, 27, 215–223.
- Prieto-Sandoval, V., Jaca, C., & Ormazabal, M. (2018). Towards a consensus on the circular economy. *Journal of Cleaner Production*, 179, 605-615. <https://doi.org/10.1016/j.jclepro.2017.12.224>
- Saha, K., Dey, P. K., & Papagiannaki, E. (2021). Implementing circular economy in the textile and clothing industry. *Business Strategy and the Environment*, 30, 1497–1530. <https://doi.org/10.1002/bse.2670>
- Sikander, M., Kumar, L., Naqvi, S. A., Arshad, M., & Jabeen, S. (2021). Sustainable practices for reduction of environmental footprint in tanneries of Pakistan. *Case Studies in Chemical and Environmental Engineering*, 4,100161. <https://doi.org/10.1016/j.cscee.2021.100161>
- Turetken, O., Jethefer, S., & Ozkan, B. (2019). Internal audit effectiveness: operationalization and influencing factors. *Managerial Auditing Journal*, 35(2), 238–271. <https://doi.org/10.1108/MAJ-08-2018-1980>
- Vazquez-Brust, D. A., & Plaza-Ubeda, J. A. (2021). Sustainability: the alternative solution for achieving the balance between both the natural and the economic system. *Sustainability*, 13 (9), 4610. <https://doi.org/10.3390/su13094610>
- Zamani, B., Sandin, G., Svanström, M., & Peters, G. M. (2018). Hotspot identification in the clothing industry using social life cycle assessment—opportunities and challenges of input-output modelling. *The International Journal of Life Cycle Assessment*, 23(3), 536-546. <https://doi.org/10.1007/s11367-016-1113-x>
- Zhang, B., Zhang, Y., & Zhou, P. (2021). Consumer attitude towards sustainability of fast fashion products in the UK. *Sustainability*, 13(4), 1646. <https://doi.org/10.3390/su13041646>



# Customs Performance Measurement – the Evidence from North Macedonia

Danijela Miloshoska<sup>1</sup> 

Received: July 2, 2023

Accepted: November 13, 2023

Published: March 16, 2024

## Keywords:

Customs administration;  
Performance measurement;  
Key performance indicators;  
Macedonian customs



Creative Commons Non Commercial CC BY-NC: This article is distributed under the terms of the Creative Commons Attribution-Non-Commercial 4.0 License (<https://creativecommons.org/licenses/by-nc/4.0/>) which permits non-commercial use, reproduction and distribution of the work without further permission.

**Abstract:** *Improving the effectiveness and efficiency of each customs administration largely depends on understanding the complexity of customs performance measurement. There are two basic reasons. Firstly, different customs administrations have different priorities: some are focused on law enforcement and the protection of society, others are focused on fair and effective revenue collection, and others are focused on trade facilitation and security. Secondly, it is recognized that developing key performance indicators (KPIs), or metrics, is very challenging and there is no “one- solution- fits- all” for the KPIs. This study attempts to offer an analysis of performance measurement in customs and to present a list of essential KPIs for Macedonian customs. The study revealed a series of difficulties with calculating the indicators as a result of the absence of sufficient data. The study provides general recommendations that should serve as a basis for the development of a more practical model for measuring the performance of Macedonian customs.*

## 1. INTRODUCTION

Customs authorities are constantly looking for ways to become more effective and more efficient by using resources better. Performance Measurement should help customs administrations to improve their effectiveness while optimizing their efficiency. One way to gauge an organization’s effectiveness and efficacy is by comparing it to other customs organizations (good practices), and the other one is by comparing it to the organization’s own history. Various studies have discussed performance measurement in customs administrations (Ireland et al., 2011; Cantens et al., 2013). These studies have found that the central purpose for using measurements in customs should be to help an agency improve its effectiveness and optimize its efficiency. Ratio analysis, horizontal analysis, and vertical analysis are a few of the methods that are used in this sense. Key performance indicators (KPIs) are task-specific metrics designed to synthesize important operating indicators into a convenient set of management tools. Although, Key performance indicators (KPIs), are increasingly being used by customs organizations to measure the effectiveness of an entity’s operations, developing key performance indicators (KPIs), or metrics, is very challenging and there is no “one-solution-fits-all”. Certain aspects of the performance of Macedonian customs have been discussed by several authors (To-sevska-Trpcevska, 2014; Miloshoska, 2016, 2018, 2022), but insufficient attention has been paid to developing key performance indicators. None of these studies have proposed a set of essential indicators that should serve as a basis for measuring the performance of Macedonian customs. This study attempts to offer an analysis of performance measurement in customs and to present a list of essential KPIs for Macedonian customs.

<sup>1</sup> University St Kliment Ohridski Bitola, Faculty of Tourism and Hospitality-Ohrid, Kej Makedonija, 95, 6000 Ohrid, Republic of North Macedonia

## 2. LITERATURE REVIEW

Performance measurement as a research topic appeared in the late 1980s and 90s when many academics criticized the problems with traditional financial measures (Dixon et al., 1990; Goldratt & Cox, 1986; Hayes & Abernathy, 1980; Johnson & Kaplan, 1987; Kaplan & Norton, 1992; Neely et al., 1995). Since then, several performance measurement frameworks have emerged. Neely (1999) reports more than 3600 articles on performance measurement published from 1994 to 1996.

Performance measurement is defined as “the process of quantifying effectiveness and efficiency of actions,” and a performance measurement system is defined as “the set of metrics used to quantify both the efficiency and effectiveness of actions” (Neely et al., 1995). “A performance measurement system is an information system that supports managers in the performance management process mainly fulfilling two primary functions: the first one consists in enabling and structuring communication between all the organizational units (individuals, teams, processes, functions, etc.) involved in the process of target setting. The second one is that of collecting, processing, and delivering information on the performance of people, activities, processes, products, business units, etc.” (Forza & Salvador, 2000, p. 359). Waggoner et al. (1999) claim that performance measurement in the business allows for monitoring performance, identifying weaknesses in certain areas, improving communication, and strengthening motivation and responsibilities.

Performance management in the public sector has intensified during the past three decades, increasing formalized planning, control, and reporting in the public sector across all OECD countries (Bouckaert & Halligan, 2007, p. 29). Various groups of authors have contributed to the development of performance management theory, including public administration, and public management. Performance management in the public sector has been introduced as part of reforms aimed at making public management more like private management in terms of efficiency and effectiveness. It has been accused of neglecting the specificities of public administrations such as higher goal ambiguity, fewer economic incentives, higher levels of bureaucracy, a greater number of stakeholders, and higher relevance of public values (Bozeman, 1987; Perry & Rainey, 1988; Lee et al., 2009; Hvidman & Andersen, 2014). The literature identifies differences between performance management approaches in the private sector and public administration. For instance, in the private sector, sales represent a prompt and objective Indicator that reflects the success of the company. When it comes to public administration, it is difficult to determine prompt and objective indicators that will reflect the performance of the administration. Even, if certain indicators are identified, their interpretation depends on the context as well as on the activities of the specific public administration being measured. One of the most widespread performance management frameworks for public administration is the Balanced Scorecard (BSC) developed by Robert Kaplan and David Norton and introduced in 1992. According to Hoque (2014), even when discussing other systems or frameworks developed since then, the BSC is broadly mentioned and sometimes used as a starting point.

Customs Performance Measurement is a continuous gathering and analysis of data, in order to assess outputs and outcomes for determining the effectiveness of strategies and operations, identify areas of improvement, and address any deficiencies or shortcomings. Customs performance measurement is most effective when it takes into account the aims unique to the Customs service and the specific political, social, economic, and administrative conditions in the respective country (Ireland et al., 2011).

Performance Measurement should help customs administrations to improve their effectiveness while optimizing their efficiency. Effectiveness refers to the extent to which the organization is achieving the outcome. Efficiency refers to the ratio of relevant outputs to relevant inputs and can include costs, steps in a process, or time, for example (WCO, 2012). Cantens et al. (2013) conclude that the central purpose for using measurements or any other technique in customs and tax reform should be to help an agency improve its effectiveness and optimize its efficiency. Ireland et al. (2011) conclude that performance measurement should primarily be about improving the effectiveness and efficiency of Customs administration functions and that secondarily it can be beneficial for attracting donor funding. According to the World Bank (WB) (2008), the effectiveness and efficiency of a country's public sector are vital to the success of development activities, sound financial management, an efficient civil service and administrative policy, an efficient and fair collection of taxes, and transparent operations. When these are relatively free of corruption, they all contribute to the good delivery of public services. The importance of performance measurement in customs is recognized by the World Customs Organization (WCO) by developing the Achieving Excellence in Customs (AEC), consisting of 20 indicators to measure policy implementation of members in the four primary areas: Trade Facilitation and Security; Fair and Effective Revenue Collection; Protection of Society; and Institutional and Human Resource Development.

### 3. MATERIALS AND METHODS

In order to overcome the limitations of the one-dimensional approach of measuring performance by analysing only the financial results, the multidimensional approach of Kaplan and Norton is used in this study. Financial results show what happened in the past, not where the organization is or should be going. The multidimensional approach of a balanced scorecard system aims to provide a more comprehensive view to stakeholders by complementing financial measures with additional metrics that gauge performance. The balanced scorecard approach was laid out in a 1992 paper published in the Harvard Business Review by Robert S. Kaplan and David P. Norton. The balanced scorecard system allows the translation of the strategic goals of the customs administrations into a set of organizational performance objectives that, in turn, are measured, monitored, and changed if necessary to ensure that an organization's strategic goals are met. The main method used in the study is system analysis, which enables the identification of principles and patterns for constructing a list of essential KPIs for Macedonian customs. In order to specify the relative importance of a KPI (its weight) the method of Weight of a metric is used. The weight of the metric shows its relevant importance compared to other metrics of a hierarchical scorecard expressed as a percentage. The total for all metrics in the scorecard must equal 100%.

### 4. RESULTS

An analysis of legal documents covering customs activities, especially the Strategic Plan of the Customs Administration of the Republic of North Macedonia until 2024, identified four key areas that are incorporated into the following strategic goals: Trade facilitation, Protection of the society, Revenue collection and protection of the financial interests and Organizational and infrastructural development. The balanced scorecard (BSC) is a comprehensive approach that allows converting an organization's strategic goals into a set of organizational performance objectives that, in turn, are measured, monitored, and changed if necessary to ensure that an organization's strategic goals are met. The balanced scorecard approach analyses performance from four aspects: Financial analysis, Customer analysis, Internal analysis of business processes, and

Learning and growth perspective of the employees. The application of a balanced scorecard approach to customs activities requires customized scorecards to fit their different situations, strategic goals, and specific political, social, economic, and administrative conditions.

As Kaplan and Norton (1992) stressed that the balanced scorecard “is not a template to be applied... in general”, customized scorecards for assessing the performance of customs authorities can be introduced. Based on the BSC, four proposed areas of performance assessment of Macedonian customs are: 1. Revenue collection (Financial perspective); 2. Trade facilitation (Customer perspective); 3. Protection of the society (Business perspective); 4. Organizational and infrastructural development (Learning and growth perspective). The proposed areas of performance assessment require the development of key performance indicators (KPIs) for each identified area. Key performance indicators should be designed with care and attention. The purpose of KPI must be not to reflect the activity of the customs service but to its results and performance-that is the improvement in its effectiveness and efficiency in carrying out its mission. Focusing on results, rather than its activity, serves to point the entire organization toward its mission. Accountability is also enhanced when the focus shifts to outcomes (Niven, 2003). The proposed system of performance indicators of Macedonian customs is presented in Table 1.

To achieve their intended purpose, key performance indicators must be SMART. The acronym “SMART KPI” stands for “Key Performance Indicators” which are “Specific, Measurable, Achievable, Relevant, and Time-specific.” SMART KPIs are measurable metrics used to assess customs performance.

**Table 1.** List of essential key performance indicators (KPIs) for Macedonian customs

Strategic goals	Performance objectives	Key performance indicators (KPI)	Weight %
1. Revenue collection and protection of the financial interests	Ensuring efficient revenue collection	<ol style="list-style-type: none"> <li>Forecast revenue vs. actual collected amount (Rate of revenue target achievement)</li> <li>Proportion of revenue split by import duty, tax, and excise</li> <li>Proportion of revenue collected for each: red, yellow, and green imports</li> <li>Proportion of revenue collected post-clearance audit and excise audit</li> <li>Variation (increase or decrease) of customs collection over time as a percentage of GDP by type of tax (customs duties, VAT, excise duties, and so on)</li> <li>Proportion of customs collection of total revenue collected (in monetary value and as a percentage of GDP)</li> <li>Level of customs collection relative to the variation (growth or reduction) of international trade</li> <li>Proportion of customs collection over time by type of procedures</li> <li>Amount of revenue recovered and related penalties collected because of customs intervention (valuation liftings, origin correction, tariff classification, suspensive regimes misuse, exemptions, unreported goods, smuggled goods)</li> </ol>	30
2. Trade facilitation	<p>Harmonization of the national Customs Legislation with the legislation and best practices of the European Union</p> <p>Digitization of customs and excise procedures</p> <p>Modernization of customs IT infrastructure to support operations</p> <p>Trade facilitation through regional economic integration</p>	<ol style="list-style-type: none"> <li>Release time in hours for imports that do not undergo physical inspection</li> <li>Release time in hours for exports that do not undergo physical inspection</li> <li>Release time in hours for imports that do undergo physical inspection</li> <li>Release time in hours for exports that do undergo physical inspection</li> <li>Number of improved customs procedures developed in consultation with traders</li> <li>Total value of cross-border imports executed by AEO traders</li> <li>Total value of cross-border exports executed by AEO-accredited traders</li> <li>Improvement in the traders’ perception of cross-border facilitation</li> </ol>	30

3. Protection of the society	Fight against illegal trade and organized crime	1. Trends in the percentage of import declarations processed through each selectivity channel 2. Offense rate on import declarations: Physical and documentary inspection 3. Offense rate on import declarations: Documentary inspection 4. Offense rate on export declarations: Physical and documentary inspection 5. Offense rate on export declarations: Documentary inspection 6. Proportion of examinations that result in seizures 7. Proportion of released consignments within the total number of consignments 8. Proportion of consignments for which customs inspection was conducted within the total number of consignments 9. Proportion of consignments in which violations were detected within the total number of consignments	25		
	Ensuring efficient management of excise goods				
	Strengthening the area of „prohibitions and restrictions“				
4. Organizational and infrastructural development	Measures for the Prevention of misconduct and Conflict of interest			1. Ratio of the total number of official offenses to the total number of customs officials 2. Number and type of investigations- % change in investigations 3. Proportion of key customs functions and processes that have a risk map 4. Number of measures implemented to reduce officers' discretion 5. Variation in the number of officers conduct complaints 6. Variation of the perception of corruption by the trade community 7. Training and Development Effectiveness 8. Percentage of Performance-based Promotions 9. IT System Response Time 10. Budget Execution Rate	15
	Improvement of the quality control of the working processes				
	Strengthening Human Resources Management				
	Development of IT support systems				
	Strengthening the mid-term budgeting				
	Promotion and international cooperation				

Source: Author

## 5. DISCUSSION

The revenue collection strategic goal focuses on ensuring efficient revenue collection. Calculation of the Rate of revenue target achievement requires constructing theoretical revenue that could have been collected. Customs administration does that only when misdeclaration or fraud is discovered. However, not all misdeclaration or fraud is discovered, so determining forecast revenue requires considerable effort. A list of 9 KPIs is given in Table 1, which should help to measure customs performance in the area of revenue collection. The need to specify the relative importance of a KPI (its weight) should be done according to the set vision and mission of the Macedonian customs. To reflect this idea, the assigned weight to the indicators for Revenue Collection and Protection of the financial interests on a scale from 1% to 100% is 30%.

Indicators related to trade facilitation usually focus on time spent at the border and for clearance. This is part of the TRS+ (time-release study) implemented by the World Bank. Time Release Study (TRS) is a unique tool for measuring the performance of customs and other border agencies related to trade facilitation at the border. Regularly conducting a Time Release Study (TRS) is an obligation of World Trade Organization membership. As a member, the Republic of North Macedonia (MK) has committed to implementing Articles contained in the WTO Trade Facilitation Agreement (TFA), including Article 7.6 of the TFA, which recommends Members measure and publish the average release time of goods both periodically and consistently. The TRS was conducted in 2015 and 2022.

According to the set vision and mission of the Macedonian customs the assigned weight to the indicators for Trade Facilitation on a scale from 1% to 100% is 30%.

The main performance objective of the protection of society is to fight against illegal trade and organized crime. In Table 1 the proposed KPIs for the protection of the society of the Macedonian

customs reveal two main groups: I. Indicators on crime detection II. Indicators on the implementation of risk management approach (Miloshoska, 2016). The TRS and ASYCUDA data can provide a good indication of how the risk management operations, in terms of security and safety, are operated. According to the set vision and mission of the Macedonian customs the assigned weight to the indicators for Protection of the society on a scale from 1% to 100% is 25%.

Indicators related to organizational and infrastructural development analyze multiple aspects such as the prevention of misconduct and conflict of interest (integrity and corruption), strengthening human resources management, improvement of the quality control of the working processes, development of IT support systems, and promotion and international cooperation. But for Macedonian customs, the main performance objective in this area is the promotion of integrity and the fight against corruption. According to Miloshoska “Macedonian customs remains one of the most vulnerable sectors exposed to high levels of corruption. The corrupt behavior of customs officers in their everyday operations causes erosion of the integrity of Macedonian customs” (Miloshoska, 2022). According to the set vision and mission of the Macedonian customs the assigned weight to the indicators for Protection of the society on a scale from 1% to 100% is 15%.

## 6. CONCLUSION

While measuring the performance of Customs is an important part of improving Customs performance, developing KPIs is a very challenging question. Based on the BSC four proposed areas of performance assessment of Macedonian customs are: 1. Revenue collection; 2. Trade facilitation; 3. Protection of society; 4. Organizational and infrastructural development. The proposed areas of performance assessment of Macedonian customs served as a framework for establishing performance objectives and developing a list of essential key performance indicators (KPIs) for each identified area. The purpose of KPI must be not to reflect the activity of the customs service but to its results and performance—that is the improvement in its effectiveness and efficiency in carrying out its mission. Future research on customs performance measurement should focus on establishing a more practical model for measuring the performance of Macedonian customs. Furthermore, while this study proposed a list of essential KPIs, future studies are required to gain more insight into the calculation of the KPIs, both quantitative and qualitative.

## References

- Bouckaert, G., & Halligan, J. (2007). *Managing performance: International comparisons*. London: Routledge.
- Bozeman, B. (1987). *All organizations are public: Bridging public and private organizational theories*. San Francisco: Jossey-Bass.
- Cantens, T., Ireland, R., & Raballand, G. (2013). *Reform by Numbers Measurement Applied to Customs and Tax Administrations in Developing Countries*. International Bank for Reconstruction and Development / The World Bank, DOI: 10.1596/978-0-8213-9713-8
- Dixon, J. R., & Nanni, A. J., & Vollmann, T. E. (1990). *The new performance challenge: Measuring operations for world-class competition*. Dow Jones–Irwin Homewood IL.
- Forza, C., & Salvador, F. (2000). Assessing Some Distinctive Dimensions of Performance Feedback Information in High Performing Plants. *International Journal of Operations & Production Management*, Vol. 20, No. 3, pp. 359-385.



- Goldratt, E. M., & Cox, J. (1986). *The goal: A process of ongoing improvement*. NY: North River Press.
- Hayes, R. H., & Abernathy, W. J. (1980). Managing our way to economic decline. *Harvard Business Review*, 67–77.
- Hoque, Z. (2014). 20 years of studies on the balanced scorecard: trends, accomplishments, gaps and opportunities for future research. *Br. Account. Rev.* 46, 33–59. doi: 10.1016/j.bar.2013.10.003
- Hvidman, U., & Andersen, S. C. (2014). Impact of performance management in public and private organizations. *Journal of Public Administration Research and Theory*, 24, 1, 35-58.
- Ireland, R., Cantens, T., & Yasui, T. (2011). *An Overview of Performance Measurement in Customs Administrations*. Brussels: WCO Research Paper No. 13.
- Johnson, H. T., & Kaplan, R. S. (1987). *Relevance lost – The rise and fall of management accounting*. Boston, MA: Harvard Business School Press.
- Kaplan, R. S., & Norton, D. P. (1992). The balanced scorecard—measures that drive performance. *Harvard Business Review*.
- Lee, J. W., Rainey, H. G., & Chun, Y. H. (2009). Of politics and purpose: political salience and goal ambiguity of US federal agencies. *Public Administration*, 87, 3.
- Miloshoska, D. (2016). Security Roll of the Macedonian Customs. *European Journal of Law and Political Sciences*, 16-20.
- Miloshoska, D. (2018). Customs and Corruption: the case of the Republic of Macedonia. *Conference proceedings of the international scientific conference “Towards a Better Future: The Rule of Law, Democracy and Polycentric Development” Volume 2*.
- Miloshoska, D. (2022). RISK MANAGEMENT APPROACH IN MACEDONIAN CUSTOMS. *6<sup>th</sup> FEB International Scientific Conference Challenges in Economics and Business in the Post-COVID Times*.
- Neely, A. (1999). The performance measurement revolution: Why now and what next? *International Journal of Operations and Production Management*, 19(2), 205–228.
- Neely, A., Mills, J., Gregory, M., & Platts, K. (1995). Performance measurement system design – A literature review and research agenda. *International Journal of Operations and Production Management*, 15(4), 80–116.
- Niven, P. R. (2003). *Balanced scorecard step-by-step for government and nonprofit agencies*. John Wiley & Sons, Hoboken, NJ.
- Perry, J. L., & Rainey, H. G. (1988). The public-private distinction in organization theory: A critique and research strategy. *Academy of Management Review* 13.2, 182-201.
- Tosevska-Trpcevska, K. (2014). Effects of the implementation of single window and simplified customs procedures in the Republic of Macedonia. *World Customs Journal*.
- Waggoner, D., Neely, A., & Kennerley, M. (1999). The forces that shape organizational performance measurement systems: An interdisciplinary review. *International Journal of Production Economics*, 60–61, 53–60.
- World Bank (WB). (2008). *Public Sector Reform: What Works and Why? An IEG Evaluation of World Bank Support*.
- World Customs Organization (WCO). (2012). *Organizational Performance Measurement, The Development Compendium*.





# How Innovation Drives Firm Performance in the Post COVID-19 Pandemic?

Brunilda Kosta<sup>1</sup> 

Received: August 29, 2023  
Accepted: January 26, 2024  
Published: March 16, 2024

## Keywords:

Innovation;  
Firm performance;  
COVID-19



Creative Commons Non Commercial CC BY-NC: This article is distributed under the terms of the Creative Commons Attribution-Non-Commercial 4.0 License (<https://creativecommons.org/licenses/by-nc/4.0/>) which permits non-commercial use, reproduction and distribution of the work without further permission.

**Abstract:** *The purpose of this paper is to investigate the impact of product innovation, process innovation and delivery innovation on firm performance, in response to unexpected crises such as the COVID-19 pandemic. For this purpose, the author conducted a survey with 115 Albanian companies. By employing the regression analysis, the study uncovered that product innovation has a positive significant impact on firm performance in the aftermath of COVID-19. The study also uncovers a positive yet non-significant relationship between process innovation and firm performance. Contrary to expectations, the research identifies a counterintuitive outcome in the context of delivery innovation, indicating a negative and statistically significant impact on firm performance. This research contributes to our understanding of the complex interplay between innovation and firm performance, offering valuable insights for businesses navigating the challenges of the post-pandemic landscape. The findings prompt a reevaluation of strategic approaches to innovation and underscore the need for nuanced and context-specific strategies to optimize firm outcomes.*

## 1. INTRODUCTION

In 2020, the world has been confronted by the profound upheaval brought about by the COVID-19 crisis, leading to widespread turmoil in both personal lives and economic spheres. However, amidst this unprecedented challenge, human adaptability and perseverance have manifested through innovative solutions that have emerged as crucial tools for navigating the crisis and its associated impacts.

Ever since Schumpeter (1942) first introduced the concept that innovation plays a pivotal role in securing long-term firm success, the subject of innovation has garnered significant research interest (Damanpour, 1991; Lessig, 2002; Lerner, 2012; Fishenden & Thompson, 2013; Kline & Rosenberg, 2010; Fagerberg, 2006). A plethora of innovation typologies exist. Schumpeter (1934) suggests breaking down innovation into the following categories: new products, novel production methods, innovative sources of supply, exploration of new markets, and novel business organization methods. Zaltman et al. (1973) expand the scope by identifying twenty types of innovation within the organizational context. Hage and Meeus (2006) propose four innovation types applicable to service organizations: service innovation, process innovation, technological process innovation, and administrative process innovation. Damanpour (1996) offers an encompassing definition of innovation, encompassing new products or services, groundbreaking process technologies, innovative organizational structures or administrative systems, and novel plans or programs relevant to organizational members.

The advent of the COVID-19 crisis marked a distinct inflection point in the trajectory of innovation, magnifying its already critical role within the business landscape. The crisis not only underscored the agility and adaptability that innovation brings to the fore but also accentuated its

<sup>1</sup> Faculty of Economy, University of Tirana, Arben Broci Street, 1001, Tirana, Albania

pivotal function in navigating unprecedented challenges. As the global economy grappled with disruptions across sectors, the inherent capacity of innovation to engender novel solutions and transformative strategies became ever more apparent. Nonetheless, the literature presents divergent evidence regarding the dual effects – both negative and positive – that such crises can have on the innovation capacity of firms. While some studies confirm a notably positive impact on innovation capacity, others assert the presence of a negative effect stemming from such crises (Jin et al., 2022; Zhang & Zheng, 2022; Sahi et al., 2023; Lim & Morris, 2023; Zia et al., 2023; Sharma et al., 2022).

In the aftermath of the COVID-19 crisis, innovation emerged as a linchpin for organizations striving to recover and thrive in the face of heightened uncertainties. Enterprises were impelled to reassess traditional operating paradigms and swiftly devise innovative alternatives that could mitigate the far-reaching ramifications of the crisis. This entailed not only the creation of new products and services tailored to the altered consumer landscape but also the reimagining of processes, supply chains, and even business models (Seetharaman, 2020; Mancuso et al., 2023; Mattera et al., 2022). Businesses often turn to innovation as a strategy to solidify their market position, attain a competitive edge, and enhance overall business performance. The empirical landscape widely substantiates that innovation yields a positive influence on business performance prior to the emergence of the COVID-19 crisis (Gunday et al., 2011; Atalay et al., 2013; Prifti & Alimehmeti, 2017). However, the scenario becomes more nuanced when examining the impact of innovation on business performance amid and following the COVID-19 outbreak. Existing research in this context is relatively limited and portrays somewhat inconclusive findings. While some studies emphasize the potential benefits of innovation adaptation during crisis times (Christa & Kristinae, 2021; Siagian et al., 2021; Sharma et al., 2021; Zainal, 2022) others point to challenges and uncertainties in realizing such positive impacts (Sharma et al., 2021). Therefore, the interplay between innovation and business performance in the context of COVID-19 remains a complex and evolving area of investigation. This paper aims to investigate the influence of innovation, encompassing product innovation, process innovation, and distribution innovation, on firm performance within the specific context of Albania, in the aftermath of the COVID-19 pandemic.

This article is organized as follows. The second section provides an overview of the literature review and the development of hypotheses. The third section elucidates the data and methods employed in the study. The fourth section presents the findings of the analysis. The conclusion and implications of the study are discussed in the final section.

## 2. COVID-19 AND INNOVATION

A multitude of innovation typologies have been conceptualized within the scholarly landscape. For instance, Schumpeter (1934) outlines a breakdown of innovation into several distinct categories, including the introduction of novel products, the exploration of innovative production methods, the identification of fresh sources of supply, the pursuit of untapped market domains, and the invention of novel business organizational methodologies. Expanding on this foundation, Zaltman et al. (1973) delve into the organizational realm, unveiling an extensive range of twenty distinct innovation types that manifest within this context. Turning attention to service-oriented domains, Hage and Meeus (2006) contribute to the discourse by putting forth four innovation types that specifically pertain to service organizations. These include service innovation, which involves the creation of novel and enhanced service offerings, process innovation that streamlines and optimizes operational procedures, technological process innovation that

leverages technology for operational enhancements, and administrative process innovation that focuses on the enhancement of administrative systems and structures. Furthermore, [Damanpour \(1996\)](#) presents a comprehensive definition of innovation, which spans a wide spectrum of dimensions. This expansive definition encompasses the introduction of new products or services that bring novel value to the market, the pioneering of groundbreaking process technologies that revolutionize operations, the creation of innovative organizational structures or administrative systems that enhance efficiency and effectiveness, and the formulation of novel plans or programs targeted at improving the experiences and outcomes of organizational members.

The global landscape has been profoundly impacted by the COVID-19 pandemic, prompting researchers to explore its effects on various aspects of business and innovation. [Jin et al. \(2022\)](#) investigate the repercussions of COVID-19 on firm innovation by analyzing data from Chinese publicly listed companies during the period from January 2020 to October 2020. Their findings reveal a national-level hindrance to firm innovation within China due to the pandemic. Moreover, state-owned enterprises experience a more pronounced negative impact on innovation quality compared to non-state-owned enterprises. Large corporations also appear to be more vulnerable to the adverse effects of the pandemic on innovation efforts than small and medium-sized enterprises.

Pandemics, including COVID-19, introduce multifaceted challenges to business operations. [Zhang and Zheng \(2022\)](#) highlight how pandemics lead to extended operational timelines, increased costs, and decreased potential cash flows, ultimately impacting the overall performance of firms. On the subject of innovation, [Sahi et al. \(2023\)](#) investigate the resilience displayed by women entrepreneurs in India during the pandemic. Their research underscores how women entrepreneurs navigated the crisis by introducing product innovations, not only ensuring survival but also laying the groundwork for future expansion. This endeavor, however, varied between businesses focused on consumers and those operating in the industrial sector. [Lim and Morris \(2023\)](#) delve into the intricate relationship between innovation and a firm's COVID-19 adaptable capacity. They identify innovation as a 'double-edged sword,' with pre-pandemic innovation potentially exacerbating post-outbreak challenges, such as reduced profits and optimism. Conversely, firm-level innovation positively influences adaptable capacity, with prior innovative firms being better positioned for rapid recovery post-outbreak. [Zia et al. \(2023\)](#) focus on avoiding crisis-driven business failure by harnessing digital dynamic capabilities among business-to-business distribution firms. Through interviews, their study underscores the importance of digital distribution centers as a means to avert failure during a pandemic. Their proposed strategy involves digital sensing, digital seizing, and digital transformation, all contributing to effective crisis management. In a systematic literature review, [Sharma et al. \(2022\)](#) shed light on the catalytic role of the COVID-19 outbreak in fostering innovative responses to the challenges it presents. This highlights the power of innovation in navigating and overcoming crises.

In conclusion, the evidence reveals a dual impact of COVID-19 on firms' innovation efforts, encompassing both negative and positive outcomes.

### 3. INNOVATION AND FIRM PERFORMANCE

A range of empirical studies offers insights into the dynamics of innovation and its impact on firm performance, especially in the context of the COVID-19 pandemic. [Zainal \(2022\)](#) investigated the relationship between innovation orientation and the performance of Kuwaiti family businesses during the initial months of the pandemic. Through interviews with 150 family businesses, the

study highlighted the significant correlation between innovation orientation (assessed through dimensions like creativity, risk-taking, and future orientation) and business performance. However, the study also found that openness to change and proactiveness showed no substantial relationship with business performance. [Le and Ikram \(2022\)](#) delved into the interplay between sustainability innovation, firm competitiveness, and firm performance within Vietnam's SME sector. Analyzing data from 435 valid responses, the study revealed a noteworthy positive association between sustainability innovation and firm competitiveness. Moreover, firm competitiveness exhibited a positive correlation with financial, environmental, and operational performance. Notably, the impact of sustainability innovation on financial performance was indirect but constructive. [Li et al. \(2023\)](#) examined the role of technology innovation, customer retention, and business continuity on the performance of Chinese SMEs after the COVID-19 pandemic. The study, based on survey data from 256 Chinese SMEs, found a substantial and positive link between technological innovation and firm performance in the aftermath of the pandemic. The hotelier sector also offers intriguing insights. [Sharma et al. \(2021\)](#) scrutinized the impact of COVID-19-related innovation on the performance of hotels. Notably, their analysis highlighted the contrasting effects of different types of innovation. While product innovation emerged as a significant contributor to firm value, organizational innovation displayed a relatively lower impact. This underscores the nuanced nature of innovation's influence on shareholders' perceptions in the hotel industry. [Khalil et al. \(2023\)](#) conducted a sector-specific study within the context of the COVID-19 pandemic. Focusing on star-rated hotels in Malaysia, their research showcased the constructive effects of organizational innovation on firm performance during times of crisis. The study tapped into collected survey data from these hotels, substantiating the positive influence of organizational innovation in enhancing performance even amid challenging circumstances.

Several empirical studies shed light on the relationship between product innovation and firm performance across diverse contexts, before COVID-19. [Ar \(2012\)](#) explored the impact of green product innovation on firm performance and competitive capability, with a focus on the moderating role of managerial environmental concern. The study investigated the positive and significant influence of green product innovation on both firm performance and competitive capability. In line with this, the investigation conducted by [Zaefarian et al. \(2017\)](#) investigated the impact of product innovation on firm performance. Their findings indicated that the success of product innovation has a substantial positive effect on firm performance, further underlining the significance of innovation in driving organizational success. In the realm of high-tech firms, the linkage between the introduction of a new product and the subsequent impact on firm performance becomes even more pronounced when accompanied by the implementation of marketing innovation strategies ([Lee et al., 2019](#)). However, while numerous studies have examined the relationship between product innovation and firm performance, relatively few have specifically addressed this relationship in the context of the COVID-19 pandemic. [Christa and Kristinae \(2021\)](#) addressed this gap by conducting quantitative research on 300 local product businesses in Central Kalimantan and Bali. Their study focused on the impact of product innovation on business performance during the pandemic. The findings unveiled a significant positive correlation between product innovation and firm performance, highlighting the pivotal role of innovation in maintaining business resilience during crisis times. Based on that, the following hypothesis is developed.

**H1:** Product innovation has a positive impact into business profit, during the time of crisis.

The interplay between process innovation and firm performance takes on various nuances across different contexts. Notably, in the realm of low-tech firms, the impact of process innovation on

firm performance emerges as particularly significant and direct, especially when intertwined with efforts related to organizational innovation (Lee et al., 2019).

In the specific context of Vietnam, Tuan et al. (2016) conducted a study that provided valuable insights. Their research underscored a crucial observation: process innovation possesses a direct and positive role in elevating firm performance. This finding resonated within the supporting industries of Hanoi, Vietnam, showcasing the relevance of process innovation in enhancing business outcomes. However, a limited number of studies have ventured into the specific effects of process innovation on firm performance amidst and following the COVID-19 pandemic. Amid this research gap, Rammer's investigation in 2023 shed light on the subject. His empirical study disclosed a key connection: the boost in sales resulting from improved product quality, facilitated by novel or refined process technology, directly links to the influence of process innovation on a firm's demand function (Rammer, 2023). Based on that, the following hypothesis is developed.

**H2:** Process innovation has a positive impact into business profit, during the time of crisis.

The COVID-19 pandemic has presented an unprecedented set of challenges to businesses across various industries. With widespread lockdowns, travel restrictions, and social distancing measures in place, firms found themselves in uncharted territory, facing disruptions in their traditional operations and customer interactions. As a result, many businesses were compelled to reevaluate and adapt their delivery processes to the new and rapidly changing circumstances. The necessity for innovation in delivery processes became particularly evident during periods of total closure when physical stores, offices, and traditional avenues of customer engagement were inaccessible. Firms had to quickly pivot their strategies to ensure their products and services could still reach customers, despite the limitations imposed by the pandemic. One of the primary approaches to address this challenge was the rapid adoption and expansion of digital and contactless delivery methods. Businesses that traditionally relied on in-person interactions had to transition to online platforms, enabling customers to place orders and receive products or services without the need for physical presence. This shift required firms to invest in technology, logistics, and operational processes that could accommodate this new mode of delivery. Empirical studies confirm that developing service delivery with technology is positively associated with firm performance (Chen et al., 2009; Ryu & Lee, 2016). A few studies have been developed in the aftermath of the COVID-19 pandemic to evaluate how innovation in the delivery process impacts firm performance. The study conducted by Abushaikh et al. (2018) delved into the realm of improving distribution and business performance through lean warehousing. Their investigation revealed a positive relationship between the reduction of warehouse waste and the enhancement of operational efficiency within the warehouse, as well as the efficacy of distribution activities. Despite this positive correlation, the study unveiled an intriguing observation: while an immediate and direct association between the extent of warehouse waste reduction and overall business performance wasn't apparent, the scenario is far from straightforward. The connection between warehouse waste reduction and business performance is, indeed, influenced by the intermediary factors of warehouse operational performance and distribution performance. This complex interplay underscores the intricate nature of the relationship between waste reduction, operational efficiency, distribution effectiveness, and overall business performance. Based on that, the following hypothesis is developed.

**H3:** New or significantly improved delivery processes for products/services, positively affect business profit, during the time of crisis.

## 4. RESEARCH DESIGN

### 4.1. Sample

The sampling design was formulated based on the dataset sourced from the National Business Center in Albania. To construct the sample, the researcher scrutinized the National Business Center's database for the year 2017. Given the nature of this study and the historical challenges of obtaining substantial response rates, the research aimed to secure a sample size of no less than 100 firms. For research topics of moderate complexity, [Anderson and Gerbing \(1988\)](#), as well as [Schumacker and Lomax \(1996\)](#), recommend a sample size ranging from 100 to 200 units. To ensure a representative sample, the research adopted a simple random selection method as the sampling procedure. The questionnaire was completed by 147 businesses. After logical checks to identify logical errors and missing data, the final refined database comprised 115 questionnaires. In the final sample, 87.8% of the firms are micro, small, and medium-sized, while 12.2% are large firms. Over 40% of the selected companies are under ten years old, 28% are between eleven and twenty years old, and the remaining 28% are more than twenty years old. 65% of businesses are limited liability companies, followed by 23% of physical persons and 10% of joint stock corporations.

### 4.2. Variables Measurement

In this research, the dependent variable is firm performance, while the three independent variables are product innovation, process innovation, and delivery innovation, respectively.

Business performance, serving as the dependent variable, is an ordinal variable measured by the following question: "Considering the last two years (2020, 2021), how would you rate your business's profit in comparison to your direct competitor?" being measured with a seven Likert scale (1 = much worse, 4 = the same, 7 = much better).

Product innovation is a binary variable. It takes value 1 if the firm responded yes to the following question "Two years from the outbreak of COVID-19, my firm has introduced new or significantly improved products and/or services" and zero otherwise.

Process innovation is a binary variable. It takes value 1 if the firm responded yes to the following question "Two years from the outbreak of COVID-19, my firm has introduced new or significantly improved production processes" and zero otherwise.

Delivery innovation is a binary variable. It takes value 1 if the firm responded yes to the following question "Two years from the outbreak of COVID-19, my firm has introduced new or significantly improved product/service delivery processes" and zero otherwise.

Size is a categorical variable categorized into four groups. It obtains a value of one if the company comprises 1-4 employees (Micro), a value of two for companies with 5-9 employees (Small), a value of three for those with 10-250 employees (Medium), and a value of four for companies with over 250 employees (Large).

Export orientation is captured through a binary variable. It assumes a value of 1 if the company engaged in exports during the past year; otherwise, it takes a value of zero.



Age is a categorical variable defined by three categories. It takes a value of one if the company is less than 10 years old, a value of two if it falls within the range of 11 to 20 years, and a value of three if it surpasses 20 years of age.

## 5. ANALYSIS AND FINDINGS

Before going further into understanding this relationship, it's important to make sure that the assumptions for using the linear regression model are met. First, the normality test was developed to see if the data about annual profit and the innovation types (product, process, and delivery) are distributed normally. It turns out they are. Heteroscedasticity was checked as well. These differences were randomly scattered around zero. So, it can be said there's no strange pattern in how they're spread out. Additionally, it was examined how the independent variables (the innovation types) are related to each other. The results showed that all the numbers (Variable Inflated Factors or VIFs) were below three. The results of the analysis are displayed in Table 1. In Model 1, the primary outcomes are presented, focusing exclusively on the control variables. The bigger the firm the larger is their profit. Moving on to Model 2, the analysis shifts towards exploring the influence of product innovation, process innovation, and delivery innovation on firm performance. The results in this context exhibit noteworthy patterns. Specifically, the impact of product innovation emerges as particularly influential, positively and significantly affecting firm performance in the aftermath of the COVID-19 pandemic. This finding lends support to Hypothesis 1, affirming its validity. The study's findings also unveil a positive relationship between process innovation and firm performance. However, it's important to note that this relationship does not attain the level of statistical significance. Intriguingly, the study reveals an unexpected outcome in the case of delivery innovation. Contrary to expectations, there exists a negative and statistically significant impact of delivery innovation on firm performance.

**Table 1.** Linear regression analysis

	Model 1: Basic model		Model 2: Annual profit as a dependent variable	
	Beta	Std. Error	Beta	Std. Error
<b>Constant</b>	2,508	,476	3,126	,593
<b>Size</b>	<b>,163**</b>	,077	<b>,203*</b>	,093
<b>Age</b>	-,047	,124	-,070	,158
<b>Export orientation</b>	,137	,205	-,029	,280
<b>Product innovation</b>			<b>,242**</b>	,260
<b>Process innovation</b>			,178	,352
<b>Delivery innovation</b>			<b>-,503***</b>	,353
<b>N</b>	116		116	
<b>R2 (%)</b>	,41		,183	
<b>R2 (%) adjusted</b>	,015		,115	

Note(s): \*p < 0.1, \*\*p < 0.05, \*\*\*p < 0.01

Source: Own research

## 6. CONCLUSION

This study delved into the relationship between innovation and firm performance within the specific context of Albania, following the upheaval caused by the COVID-19 pandemic. The analysis explored the impact of different innovation types – product innovation, process innovation, and delivery innovation – on firm performance. The role of product innovation emerged as a standout contributor, with a substantial positive effect on firm performance in the aftermath

of the COVID-19 pandemic. This supports Hypothesis 1 and underscores the strategic importance of introducing novel or improved products and services in navigating the uncertain business landscape post-pandemic. Furthermore, the examination of process innovation revealed a positive connection with firm performance, although the statistical significance of this relationship was not fully realized. One of the most intriguing findings was related to delivery innovation, which defied expectations by demonstrating a negative and statistically significant impact on firm performance. This counterintuitive outcome prompts further investigation into the underlying mechanisms and factors that may contribute to this unexpected result.

This study contributes to our understanding of the intricate dynamics between innovation and firm performance in the specific context of Albania following the COVID-19 pandemic. The identification of positive and negative effects among different dimensions of innovation underscores the need for tailored strategies that consider the multifaceted nature of innovation's influence on firm outcomes. These findings hold practical implications for firms aiming to adapt and thrive in the face of disruptions, encouraging a strategic approach to innovation that accounts for its varying impacts on performance.

## References

- Abushaikha, I., Salhieh, L., & Towers, N. (2018). Improving distribution and business performance through lean warehousing. *International Journal of Retail & Distribution Management*, 46(8), 780-800.
- Anderson, J. C., & Gerbing, D. W. (1988). Structural equation modeling in practice: A review and recommended two-step approach. *Psychological bulletin*, 103(3), 411.
- Ar, I. M. (2012). The impact of green product innovation on firm performance and competitive capability: the moderating role of managerial environmental concern. *Procedia-Social and Behavioral Sciences*, 62, 854-864.
- Atalay, M., Anafarta, N., & Sarvan, F. (2013). The relationship between innovation and firm performance: An empirical evidence from Turkish automotive supplier industry. *Procedia-social and behavioral sciences*, 75, 226-235.
- Chen, J. S., Tsou, H. T., & Huang, A. Y. H. (2009). Service delivery innovation: Antecedents and impact on firm performance. *Journal of Service Research*, 12(1), 36-55.
- Christa, U., & Kristinae, V. (2021). The effect of product innovation on business performance during COVID 19 pandemic. *Uncertain Supply Chain Management*, 9(1), 151-158.
- Damanpour, F. (1991). Organizational innovation: A meta-analysis of effects of determinants and moderators. *Academy of Management Journal*, 34(3), 555-590.
- Damanpour, F. (1996). Organizational complexity and innovation: developing and testing multiple contingency models. *Management Science*, 42(5), 693-716.
- Fagerberg, J. (2006). Innovation: A guide to the literature.
- Fishenden, J., & Thompson, M. (2013). Digital government, open architecture, and innovation: why public sector IT will never be the same again. *Journal of public administration research and theory*, 23(4), 977-1004.
- Gunday, G., Ulusoy, G., Kilic, K., & Alpkan, L. (2011). Effects of innovation types on firm performance. *International Journal of Production Economics*, 133(2), 662-676.
- Hage, J., & Meeus, M. T. (Eds.). (2006). *Innovation, science, and institutional change: a research handbook*. Oxford University Press, USA.
- Jin, X., Zhang, M., Sun, G., & Cui, L. (2022). The impact of COVID-19 on firm innovation: Evidence from Chinese listed companies. *Finance Research Letters*, 45, 102133.

- Khalil, M. L., Aziz, N. A., Long, F., & Zhang, H. (2023). What factors affect firm performance in the hotel industry post-COVID-19 pandemic? Examining the impacts of big data analytics capability, organizational agility and innovation. *Journal of Open Innovation: Technology, Market, and Complexity*, 9(2), 100081. <https://doi.org/10.1016/j.oiotmc.2023.100081>
- Kline, S. J., & Rosenberg, N. (2010). An overview of innovation. *Studies on science and the innovation process: Selected works of Nathan Rosenberg*, 173-203.
- Le, T. T., & Ikram, M. (2022). Do sustainability innovation and firm competitiveness help improve firm performance? Evidence from the SME sector in Vietnam. *Sustainable Production and Consumption*, 29, 588-599.
- Lee, R., Lee, J. H., & Garrett, T. C. (2019). Synergy effects of innovation on firm performance. *Journal of Business Research*, 99, 507-515.
- Lerner, J. (2012). *The architecture of innovation: The economics of creative organizations*. Harvard Business Press.
- Lessig, L. (2002). The architecture of innovation. *Duke Law Journal*, 51(6), 1783-1801.
- Li, B., Mousa, S., Reinoso, J. R. R., Alzoubi, H. M., Ali, A., & Hoang, A. D. (2023). The role of technology innovation, customer retention and business continuity on firm performance after post-pandemic era in China's SMEs. *Economic Analysis and Policy*, 78, 1209-1220.
- Lim, K. Y., & Morris, D. (2023). Business optimism and the innovation-profitability nexus: Introducing the COVID-19 adaptable capacity framework. *Research Policy*, 52(1), 104623.
- Mancuso, I., Petruzzelli, A. M., & Panniello, U. (2023). Innovating agri-food business models after the COVID-19 pandemic: The impact of digital technologies on the value creation and value capture mechanisms. *Technological Forecasting and Social Change*, 190, 122404.
- Mattera, M., Alba Ruiz-Morales, C., Gava, L., & Soto, F. (2022). Sustainable business models to create sustainable competitive advantages: strategic approach to overcoming COVID-19 crisis and improve financial performance. *Competitiveness Review: An International Business Journal*, 32(3), 455-474.
- Prifti, R., & Alimehmeti, G. (2017). Market orientation, innovation, and firm performance—an analysis of Albanian firms. *Journal of Innovation and Entrepreneurship*, 6(1), 1-19.
- Rammer, C. (2023). Measuring process innovation output in firms: Cost reduction versus quality improvement. *Technovation*, 124, 102753.
- Ryu, H. S., & Lee, J. N. (2016). Innovation patterns and their effects on firm performance. *The service industries journal*, 36(3-4), 81-101.
- Sahi, G. K., Modi, P., & Mantok, S. (2023). New product innovations in times of crisis: How did women entrepreneurs survive the COVID-19 crisis?. *Industrial Marketing Management*, 111, 19-29.
- Schumacker, R. E., & Lomax, R. G. (1996). *A beginner's guide to structural equation modeling*. Mahwah, NJ: L. L. Erlbaum Associates.
- Schumpeter, J. A. (1934). *The Theory of Economic Development: An Inquiry into Profits, Capital, Credit, Interest and the Business Cycle*, translated from the German by Redvers Opie, New Brunswick (U.S.A) and London (U.K.): Transaction Publishers.
- Schumpeter, J. A. (1942). *Capitalism, Socialism and Democracy*. Vol. 36, Harper & Row, New York, 132-145.
- Seetharaman, P. (2020). Business models shifts: Impact of COVID-19. *International Journal of Information Management*, 54, 102173.
- Sharma, A., Shin, H., Santa-María, M. J., & Nicolau, J. L. (2021). Hotels' COVID-19 innovation and performance. *Annals of Tourism Research*, 88, 103180.
- Sharma, G. D., Kraus, S., Srivastava, M., Chopra, R., & Kallmuenzer, A. (2022). The changing role of innovation for crisis management in times of COVID-19: An integrative literature review. *Journal of Innovation & Knowledge*, 100281.

- Siagian, H., Tarigan, Z. J. H., & Jie, F. (2021). Supply chain integration enables resilience, flexibility, and innovation to improve business performance in COVID-19 era. *Sustainability, 13*(9), 4669.
- Tuan, N., Nhan, N., Giang, P., & Ngoc, N. (2016). The effects of innovation on firm performance of supporting industries in Hanoi, Vietnam. *Journal of Industrial Engineering and Management, 9*(2), 413-431.
- Zaefarian, G., Forkmann, S., Mitreğa, M., & Henneberg, S. C. (2017). A capability perspective on relationship ending and its impact on product innovation success and firm performance. *Long range planning, 50*(2), 184-199.
- Zainal, M. (2022). Innovation orientation and performance of Kuwaiti family businesses: evidence from the initial period of COVID-19 pandemic. *Journal of Family Business Management, 12*(2), 251-265.
- Zaltman, G., Duncan, R., & Holbek, J. (1973). Innovations and organizations.
- Zhang, D., & Zheng, W. (2022). Does COVID-19 make the firms' performance worse? Evidence from the Chinese listed companies. *Economic Analysis and Policy, 74*, 560-570.
- Zia, N. U., Shamim, S., Zeng, J., Awan, U., Chromjakova, F., Akhtar, P., & Orel, M. (2023). Avoiding crisis-driven business failure through digital dynamic capabilities. B2B distribution firms during the COVID-19 and beyond. *Industrial Marketing Management, 113*, 14-29.



# Participative Management in the Framework of a Local Action Group

Manuela Panaitescu<sup>1</sup> 

Received: August 20, 2023

Accepted: November 8, 2023

Published: March 16, 2024

## Keywords:

Management;  
Decision making;  
Participative behavior



Creative Commons Non Commercial CC BY-NC: This article is distributed under the terms of the Creative Commons Attribution-Non-Commercial 4.0 License (<https://creativecommons.org/licenses/by-nc/4.0/>) which permits non-commercial use, reproduction and distribution of the work without further permission.

**Abstract:** *The main European policy for rural areas is the Common Agricultural Policy (CAP). Regarding the involvement of local communities, CAP, through the LEADER program, contributes to the promotion of a community-led local development strategy, supporting development projects initiated at the local level by Local Action Groups. For good functioning and achieving high efficiency, LAGs resort to the implementation of participative management in the organization. In the presented work, we propose to analyze the importance of participative management within an organization of this type - LAG "Eremia Grigorescu 1863" Galati and the contribution to the establishment of new businesses, the promotion of tourism, the creation of jobs, which lead to the sustainable development of rural economy in the South-East Region of Romania. The involvement of the LAG staff in the decision-making process led to the enrichment of the level of culture and professional training of the employees, facilitating the achievement of remarkable results in terms of the association. We used the Multi-criteria Analysis to check the way of making decisions within the Local Action Group.*

## 1. INTRODUCTION

Agriculture has been the focus field of numerous researchers, from areas both locally and abroad. Agriculture fulfills the same functions regardless of the geographical coordinates where it is located. The general definition of the concept of common agricultural policy can be formulated in different forms. The CAP constitutes the set of legal measures of execution and administration that directly or indirectly influence the conditions for the achievement and valorization of agricultural production to improve production and the standard of living of agricultural producers within the Community. The agricultural policy constitutes the set of interventions of the member states of the European Union in influencing the factors of demand and supply of agricultural and food products (EU Regulation, 2021).

The LEADER program (Links between actions for the development of the rural economy) was designed to support the sustainable rural development of the community following the CAP reforms (Schmied, 2022). Regarding the involvement of local communities, CAP, through the LEADER program, promotes the local development strategies led by the community, supporting the development projects initiated at the local level. The LEADER initiative introduced two main innovations:

1. the territorial approach by and for the local population was an empowering factor of the local society and a means by which strategies and actions in the countryside can be conceived and implemented;
2. LEADER offers a tool for carrying out such tasks, namely the Local Action Groups (LAG).

The LAG is a group of partners from the public and private sectors: municipalities, associations, citizens and private structures, located in rural areas who are responsible for implementing an

<sup>1</sup> Danubius University of Galati, Faculty of Economic Sciences, 3 Galati Blvd., Galati, Romania

organized development strategy in accordance with the European Leader program. Generally, the LAGs manage considerable European funds and have a primary role in rural development (Menconi et al., 2018, p. 14). Through the European Agricultural Fund for Rural Development, a LAG can request financial assistance in the form of subsidies for the implementation of the Local Development Strategy of its territory.

The main objective of the local development strategies is to provide support to the respective rural areas, especially through the implementation of small-scale projects (Guth et al., 2022, p. 235). Through this approach, LAGs can better target the needs and priorities of their territory. For good functioning and achieving high efficiency, LAGs resort to the implementation of participative management in the organization (Pollermann & Fynn, 2021, p. 948). The main criteria, which emphasize the need for the development and adoption of participative management, are based on the significant evolution of associated private properties that led to the implementation of institutional methods of involvement in management.

Participative management represents a modern managerial style and system. But this can only be promoted if all the actors have the same interests, regardless of their personal and professional status. The existence and awareness of common interests favor the manifestation of the initiative and creativity of each participant in carrying out managerial actions. According to Bezede (2017), “Participative management is characterized by a series of features, among which the following stand out: the active participation of the institution's employees in the exercise of the management process; the involvement of a large number of people in the exercise of the monitoring and evaluation function; the active participation of all interested parties when adopting decisions of major importance” (p. 11).

Andresescu and Panaitescu (2023) consider that “Participative management can be seen as a tool for improving the efficiency of companies and for establishing harmonious relations; as a device for the development of social education; for solidarity, between the work community and for the valorization of latent human resources; as a means of achieving industrial peace and harmony leading to greater productivity and increased output; as a humanitarian act to give the worker an acceptable status within the labor community and a sense of purpose in activity; and an ideological device for the development of self-management in the industry”.

Participative management is also successfully used at the level of territorial collectivities, where joint decision-making will ensure a series of advantages such as the substantiation of strategic and tactical decisions, the achievement of strategies in complex areas of the organization's activity, as well as the valuing of training at a higher level, the experience, the initiative of the specialists involved. This refers to the public-private partnership inherent in LAGs, how partners are involved, and how LAGs make decisions and work (Pisani et al., 2017).

According to Edelenbos and Klijn (2006), “Process management emerges as the most important condition for good and satisfactory outcomes” (p. 436). Pandeya (2015) found that “Citizen participation is usually considered to be an important mechanism for achieving development gains, strengthening local accountability, and empowering citizens” (p. 67).

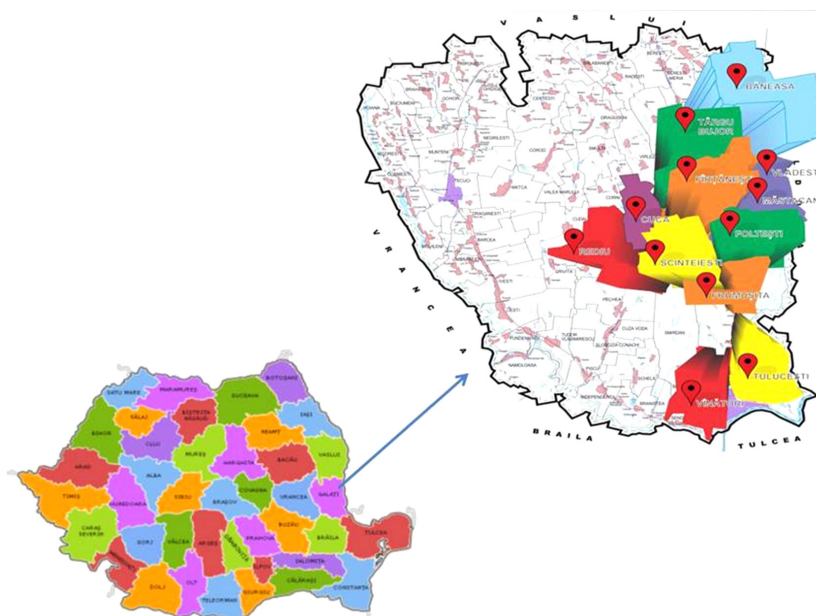
This use of participative behavior as an open transformational tool aligns with that of Albert and Hahnel (1991) regarding the theory of participative economics - an economic system based on participative decision-making.

Due to the significant influence of stakeholder groups, decision-makers must take stakeholder interests as an essential factor in decision-making and implementation. Stakeholders indirectly control and influence decision-making and play an indispensable role in preventing the abuse of power, facilitating legitimate and justified decisions to assume social responsibility (Zhaodi, 2022, p. 127).

According to Serrano and Esparcia (2023) “The LEADER program and linking actors to it, either through aid or different structures (such as LAGs), clearly help in evolution and current results, which can be considered a success of European rural development programs, as they contributed to improving the relational cohesion of both actors and territories” (p. 24).

## 2. CASE STUDY. THE DECISION-MAKING PROCESS WITHIN THE LAG “EREMIA GRIGORESCU 1863” GALATI

The study area is the LAG “Eremia Grigorescu 1863” Galati (Figure 1). This area is located in Galați County, the South-East Region of Romania. The LAG territory is made up of 12 Territorial Administrative Units (TAUs), respectively: the city of Targu Bujor, the communes of Vanatori, Tulucesti, Frumusita, Scanteiesti, Cuca, Reditu, Foltesti, Mastacani, Firtanesti, Vladesti, Baneasa.



**Figure 1.** Study area - LAG “Eremia Grigorescu 1863” Galati

**Source:** Own processing

The territorial area of the LAG is homogeneous, but insufficiently developed, with high potential in improving agricultural activity concerning private initiatives that can contribute to local social and economic evolution.

The objectives of the local development strategy LDS of the LAG concern the development of participatory processes for the enhancement of the quality of the local productions and the distribution of the benefits to the entire territory of the LAG (<https://www.galeg1863.ro/>). The GAL is made up of 39 members, of which 12 are public partners and 27 are private partners.

We have analyzed the way of decision-making within the LAG, using multi-criteria analysis (MCA) to facilitate the decision-making process regarding the choice of projects that will be

financed by the association. Evaluating and prioritizing the projects based on multiple criteria provides a structured approach to decision-making, taking into account different dimensions and weighing the importance of alternatives, providing a more comprehensive and informed decision.

In this research, the AHP (Analytic Hierarchy Process) process for ranking projects, methodology from the multicriteria analysis developed by Saaty (1980, 2008), supported the LAG members to assess and compare systematically and logically several criteria and alternatives to arrive at a well-structured decision.

The process involves the following stages:

1. Define the problem and criteria:
  - a. Decision Problem - Select the best project option among A, B, and C;
  - b. Criteria:
    - i. Project objectives;
    - ii. Project risks;
    - iii. Maturity of the project;
    - iv. Alignment with the LAG strategy.
2. Create a hierarchy:
  - a. Project Options (Option A, Option B, and Option C);
  - b. Criteria (project objectives, project risks, project maturity, alignment with the LAG strategy).
3. Pairwise comparisons

The decision-makers now need to compare the importance of each criterion in terms of the main objective (Project Evaluation) and the importance of each project option linked to each criterion. They will use the relative scale from 1 to 9 for these comparisons:

- 1 - Equal Importance,
- 3 - Slightly more important,
- 5 - Moderately more important,
- 7 - Significantly more important,
- 9 - Extremely more important.

The decision-makers provide the following pairwise comparisons (Table 1), assuming the following comparison matrix for the criteria, where the values represent the relative importance of the rows compared to the columns.

**Table 1.** Comparison matrix for the criteria

	Project objectives	Project risks	Maturity of the project	Alignment with the LAG strategy
Project Objectives	1	3	3	5
Project Risks	1/3	1	1	3
Maturity of the Project	1/3	1	1	3
Alignment with the LAG strategy	1/5	1/3	1/3	1

**Source:** Own calculations

4. Calculate priority weights

Using the AHP calculations, the decision-makers obtain the priority weights (Table 2), for the criteria:



**Table 2.** Priority weights

Criteria	Project objectives	Project risks	Maturity of the project	Alignment with the LAG strategy
Priority Weight	0.434	0.204	0.204	0.158

Source: Own calculations

### 5. Check consistency

After calculating the priority weights, the decision-makers should check the consistency of the comparisons. If the consistency ratio is within an acceptable range (e.g. less than 0.1), the comparisons are consistent.

### 6. Aggregation and synthesis

Now the decision-makers can evaluate the project options based on these criteria, rating each project (Table 3), on a scale from 1 to 10 for each criterion (higher values being more favorable):

**Table 3.** Rating projects

Project Options	Project objectives	Project risks	Maturity of the project	Alignment with the LAG strategy
Option A	8	4	7	9
Option B	7	6	6	8
Option C	9	3	8	7

Source: Own calculations

To calculate the overall scores for each investment option, the decision-makers multiply the ratings with the corresponding criteria weights and sum up the results (Table 4):

**Table 4.** Overall Score

Project Options	Overall Score
Option A	7.138
Option B	6.750
Option C	7.256

Source: Own calculations

### 7. Select the best investment

Based on the overall scores, the decision-makers can see that Project C has the highest score (7.256) and is the most favorable option. Therefore, according to the AHP analysis, Project C is the recommended choice.

## 3. FUTURE RESEARCH DIRECTIONS

The decision-making process may involve more criteria, alternatives, and data gathering to make a well-informed investment decision. AHP helps structure the decision-making process and provides a rational basis for the final choice.

This paper can be expanded and detailed further in the future, considering the development of a good practice guide that would be effective for evaluators of projects/investments proposed for funding. At the same time, how the principle of partnership is applied by LAGs for the development of SDL may be worth further investigation through monitoring and/or evaluation.

## 4. CONCLUSION

The development of rural areas in Romania is quite low compared to what rural areas mean in European Union countries that have benefited from funding through the Rural Development Program since 1991 when the measurement began.

The Local Development Strategy of the “Erechia Grigorescu 1863” LAG, Galati falls within the European policies regarding rural development by addressing all relevant dimensions - economic, social, cultural, and environmental. The general objective of the strategy is balanced and innovative rural development by ensuring the long-term development and economic, social and cultural stability of the territory that forms the LAG in interconditionality with the protection and conservation of the environment and landscapes, maintaining soil fertility, ensuring habitats and biodiversity, preservation of traditions and cultural heritage.

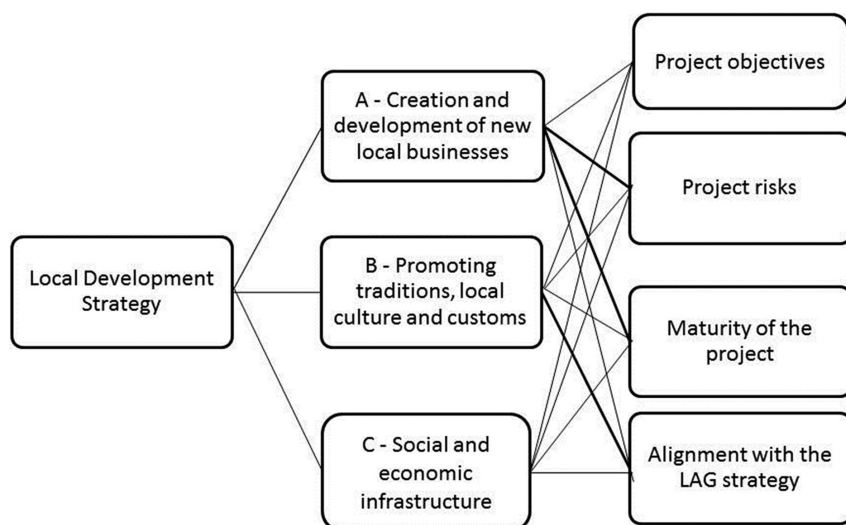
Among the main tasks of the LAG according to the EU status and regulations, we mention:

1. strengthening the capacity of local actors to develop and implement operations, including promoting their project management capacities;
2. designing a non-discriminatory and transparent selection procedure and objective criteria for the selection of operations, avoiding conflicts of interest;
3. ensuring, during the selection of operations, the coherence with the local development strategy placed under the responsibility of the community, by giving priority to the operations according to the contribution made to the achievement of the objectives and targets of the strategy;
4. monitoring the implementation of the local development strategy placed under the responsibility of the community and the supported operations and carrying out specific evaluation activities in relation to that strategy.

For the evaluation of the three types of projects financed by the LAG through the measures of the Local Development Strategy, the Selection Committee appointed to make the decision, applied the AHP method, according to the stages presented above. The financing plan provided in the LDS considers the financing of projects for the following priorities: Option A - Creation and development of new local businesses, Option B - Promoting traditions, local culture and customs or Option C - Social and economic infrastructure.

The criteria used to make the decision: Project objectives, Project risks, Maturity of the project and Alignment with the LAG strategy and the awarded points led to the assessment of project C as the optimal variant for financing (Figure 2).

The AHP methodology helps prioritize components by assigning relative weights to criteria and alternatives. This prioritization allows decision-makers to focus on the most important factors, leading to more effective decision outcomes. AHP includes a consistency check to ensure that the judgments provided by decision-makers are consistent and logical, helping to reduce cognitive biases and increase the reliability of the decision-making process. The methodology also provides a transparent framework for decision-making, making it easier to communicate the reasoning behind a decision to stakeholders. The methodology used is useful for group decision-making as it provides a structured approach for aggregating individual opinions and preferences, allowing for consensus building among group members by facilitating discussion and clarifying differences in viewpoints.



**Figure 2.** The Decision-making for project evaluation

Source: Own processing

## References

- Albert, M., & Hahnel, R. (1991). *The Political Economy of Participative Economics*. Princeton: Princeton University Press.
- Andresescu, L., & Panaitescu, M. (2023, In Press). Participative Management, Paper presented at *18th International Conference on European Integration - Realities and Perspectives*, Danubius University of Galati, Galati, May 19 - 20, 2023, <https://conferences.univ-danubius.ro/index.php/EIRP/EIRP2023/paper/view/3116>.
- Bezede, R. (2017). Participative management – key resource for sustainable organizational development. *Pro Didactica*, 1 (101), 10-14, [http://www.prodidactica.md/revista/Revista\\_101.pdf](http://www.prodidactica.md/revista/Revista_101.pdf).
- Edelenbos, J., & Klijn, E. H. (2006). Managing stakeholder involvement in decision-making: a comparative analysis of six interactive processes in The Netherlands. *Journal of Public Administration Research and Theory*, 16(3), 417-446, <https://doi.org/10.1093/jopart/mui049>.
- Guth, M., Stępień, S., Smędzik-Ambroży, K., & Matuszczak, A. (2022). Is small beautiful? Technical efficiency and environmental sustainability of small-scale family farms under the conditions of agricultural policy support. *Journal of Rural Studies*, 89, 235-247. <https://doi.org/10.1016/j.jrurstud.2021.11.026>
- Menconi, M. E., Artemi, S., Borghi, P., & Grohmann, D. (2018). Role of Local Action Groups in Improving the Sense of Belonging of Local Communities with Their Territories. *Sustainability*, 10, 4681, 1-19, <https://doi.org/10.3390/su10124681>
- Pandeya, G. P. (2015). Does Citizen Participation in Local Government Decision-Making Contribute to Strengthening Local Planning and Accountability Systems? An Empirical Assessment of Stakeholders' Perceptions in Nepal. *International Public Management Review*, 16 (1), 67–98, <https://ipmr.net/index.php/ipmr/article/view/247>.
- Pisani, E., Christoforou, A., Burlando, C., Da Re, R., & Franceschetti, G. (2017). Practicing Social Capital in Local Development: How the Method Applies to Real-World Cases, In *Social Capital and Local Development*, Palgrave Macmillan Cham, 229–254. <https://link.springer.com/book/10.1007/978-3-319-54277-5>
- Pollermann, K., & Fynn, L. L. (2021). Place-based and participative approaches: reflections for policy design in rural development, *Regional Science Association International*, Angra do Heroísmo, Azores, Portugal, pp. 946-949. <https://www.regionalscience.org/images/PDF/>

- Saaty, T. L. (1980). *The Analytic Hierarchy Process*. New York: McGraw Hill. International, Pittsburgh: RWS Publications.
- Saaty, T. L. (2008). Decision making with the analytical hierarchy process. *Int. J. Services Sciences, 1*, (1), 83-98.
- Schmied, D. (2022). *Winning and Losing: The Changing Geography of Europe's Rural Areas*. Routledge.
- Serrano, J. J. & Esparcia, J., (2023). Diagnosis of Rural Development Processes Based on the Stock of Social Capital and Social Networks: Approach from E-I Index. *Land, 12*, 850, 1-28. <https://doi.org/10.3390/land12040850>
- Zhaodi, Y. (2022). The Role of Stakeholders in Corporate Governance: The Reverse Path of Stakeholders' Participation in Corporate Governance, *Journal of Social Science and Humanities, 4*, (11) 124-128. [https://doi.org/10.53469/jssh.2022.4\(11\).27](https://doi.org/10.53469/jssh.2022.4(11).27)

### Additional reading

[https://agriculture.ec.europa.eu/common-agricultural-policy\\_en](https://agriculture.ec.europa.eu/common-agricultural-policy_en)

<https://www.galeg1863.ro/>

<https://www.madr.ro/axa-leader.html>

<https://www.madr.ro/planul-national-strategic-pac-post-2020.html>

Regulation (EU). 2021/2116 of the European Parliament and of the Council of 2 December 2021 on the financing, management and monitoring of the common agricultural policy and repealing Regulation (EU) No 1306/2013. [https://eur-lex.europa.eu/legal-content/EN/TX-T/?uri=uriserv:OJ.L\\_.2021.435.01.0187.01.ENG](https://eur-lex.europa.eu/legal-content/EN/TX-T/?uri=uriserv:OJ.L_.2021.435.01.0187.01.ENG)



# On the Relationship between ISO Standards and the Logistic Performance Index

Enriko Ceko<sup>1</sup>

Received: June 17, 2023

Accepted: January 31, 2024

Published: March 16, 2024

## Keywords:

Logistics;  
Supply chain management;  
Transport;  
Quality management;  
ISO standards



Creative Commons Non Commercial CC BY-NC: This article is distributed under the terms of the Creative Commons Attribution-Non-Commercial 4.0 License (<https://creativecommons.org/licenses/by-nc/4.0/>) which permits non-commercial use, reproduction and distribution of the work without further permission.

**Abstract:** *Using regression analysis, the paper aims to clarify the relationship between trade logistics issues, expressed with the logistic performance index, and quality management, expressed with the ISO standards index. The paper opted for an exploratory study using regression analysis to find relations between the logistics performance index and the ISO standards index, using data complemented Logistic Performance Index, and ISO Standards certificates issued worldwide, providing statistical insights into the relations between the LPI and QM, and the ISO Standards Index. It suggests that successful business organizations should invest in QM, especially in ISO standards improving their logistics, and competitive advantage. This research addresses a previously stated requirement by doing a regression analysis to investigate how quality management (ISO certifications) and logistics are significantly connected. The study's findings emphasize the importance of investing in quality management to gain a competitive advantage in logistics, recognizing the importance of the ISO certification process and quality management procedures and processes.*

## 1. INTRODUCTION

In this critical analysis/research paper the relations between the logistic performance index and ISO standards index are investigated, as they are important factors in healthy supply chain management procedures and processes. The key subject examined in this study was the relationship between the Logistics Performance Index and the ISO Standards Index utilizing quantitative approaches combined with regression analysis, because of the supposed strong relationship between transportation issues and quality management system principles, especially with ISO standards. Scientific management, including quality management, creates opportunities for long-term sustainable transport sector development. Strong and sustained relations exist between quality management/ISO standards, doing business climate, innovation, creativity, business sophistication, market sophistication, etc. All of those subjects, combined with quality management principles help better the management and functioning of logistics and supply chain management. Worldwide countries are recently facing logistics problems affecting businesses' development and performance, development and economic growth, life quality, and sustainable development relations while improving the quality of institutions and the institutions of quality (accreditation, standards, meteorology and calibration, and certification bodies), the structure and infrastructure of quality, and worldwide climate of business doing, ISO standards usage, aiming to have a positive impact on improving logistics performance index and transportation processes and procedures worldwide.

<sup>1</sup> Canadian Institute of Technology, Street “Xhanfize Keko”, No. 12. ZIP Code 1001, Tirana. Albania

## 2. MATERIAL AND METHODS

### 2.1. ISO International Standards Benefits of Use

Governments, industry, consumers, the economy, society, and the environment may all benefit from implementing ISO standards, according to ISO (ISO, 2018).

**Table 1.** ISO standards usage benefits

No	Subject	Benefits
1	Government	Regulators can rely on ISO standards as a solid base on which to create public policy that helps further SDG goals such as human rights, water, and energy efficiency, public health, and more. International Standards also help governments achieve their national and international commitments.
2	Industry	Industry plays a key role in achieving all the SDGs and ISO standards help it do that by providing guidelines and frameworks on everything, from employee health and well-being to energy consumption, to resilient and eco-friendly infrastructures.
3	Consumers	Many of the benefits are felt at the local community level. Reduced poverty, improved health, cleaner and more abundant water, and safe and secure infrastructures are just some of the benefits to be gained from implementing ISO standards.
4	Economic	ISO International Standards promote economic sustainability by facilitating international trade, improving a country's national quality infrastructure, and supporting sustainable business practices (A quality infrastructure is a system contributing to governmental policy objectives in areas including industrial development, trade competitiveness in global markets, efficient use of natural and human resources, food safety, health, the environment, and climate change). They cover everything from efficient farming methods to anti-bribery management systems.
5	Social	ISO International Standards promote social sustainability by helping countries and communities improve the health and well-being of their citizens. They cover all aspects of social welfare, from healthcare systems and related products to social inclusion and accessibility.
6	Environmental	ISO International Standards promote environmental sustainability by helping businesses and countries manage their environmental impact. They cover such aspects as implementing an environmental management system, measuring and reducing greenhouse gas emissions and energy consumption, and encouraging responsible consumption.

Source: Own research

## 3. BENEFITS OF USING ISO FOR TRANSPORT AND LOGISTICS

ISO standards address all areas of transportation, including road vehicles, ships, airplanes, and aerospace systems, from submarines to spacecraft. Transporting products and people securely and efficiently is critical to a healthy economy and personal mobility. And, as the number of routes undertaken increases year after year, so does the importance of ISO standards. ISO standards establish a consistent foundation for improving safety and reducing impact across the board, from design, building, and usage to how autonomous vehicles are led. ISO standards help the shipping business work smoothly, and you can find them at every point of the supply chain.

Consider ISO Technical Committee ISO/TC 104, Freight Containers, which specifies practically every element of containers, from size to handling and nomenclature. ISO also has a committee dedicated to ships and maritime technologies. ISO/TC 8's work addresses a wide range of industrial issues, from environmental management to supply chain security to smart shipping. In this sense, ISO standards are at the forefront of logistics innovation. The committee collaborates closely with the International Maritime Organization (IMO) to guarantee that its standards

are followed and that IMO laws are met. ISO standards are also useful in connecting ports with rail hubs, air freights, and land-based distribution, improving the efficiency with which commodities are carried. Because ISO standards are a great instrument for ensuring collaboration and efficiency across the supply chain, they contribute significantly to integrating ships, ports, and people. The transportation and logistics business is, without a doubt, the backbone of every economy. It is also one of the most notorious industries for creating irreversible environmental damage. As a result of ISO Certification for Transport and Logistics, these businesses may strike a balance between development and environmental sustainability by standardizing their systems and processes in accordance with internationally recognized and approved criteria. The transportation and logistics sectors are high-risk enterprises. As a result, there is widespread worry about the safety of transportation and logistical services. The ultimate necessity for ISO certification may be felt at every level of the supply chain. Some issues to consider in this respect are as follows:

**Table 2.** Issues to consider related to ISO standards and the Transport and Logistics sector

No	Issues
1	Most likely, the ISO standards add to the adequacy of the functions carried out in the transportation and logistics business.
2	ISO standards help to connect custom ports with railroads.
3	The ISO Certification helps you to build a bridge to get hold of international attention.
4	Helps you to show your commitment to customer satisfaction.
5	The ISO certification helps with offering significantly more capability in how the consignments are systematized.

Source: Own research

#### 4. THE MOST REQUIRED ISO STANDARDS APPROPRIATE FOR TRANSPORT AND LOGISTICS INDUSTRIES

The most required ISO standards for the transport and logistics sector are:

**Table 3.** The most required ISO standards in the Transport and Logistics sector

No	ISO standard	Description/Explanation
1	ISO 9001	Is a scheme for establishing Quality Management Systems (QMS) in your organization. ISO 9001 Certification ensures that the quality of your products is at par with international standards and is less prone to accidents and damages.
2	ISO 14001	Implementation of an Environmental Management System (EMS) in organizations help in reducing the adverse impact of your activities on the environment as well and ISO 14001 Certification ensures that your products are environment-friendly.
3	ISO 22301	Sets out the code for implementing Business Continuity Management Systems (BCMS) in your organization. ISO 22301 Certification guards you against any incidence of disruption to your business and reduces your downtime by ensuring rapid recovery.
4	ISO 39001	Helps in the implementation of Road Traffic Safety Management System in your organization. ISO 39001 Certification helps in managing the risks associated with road safety and reduces the incidents of accidents and deaths.
5	ISO 45001	Provides a foundation for establishing Occupational Health and Safety Management Systems (OHSMS) in organizations and ensures the safety and well-being of manpower.

Source: Own research

## 5. ADVANTAGES OF ISO CERTIFICATION FOR THE LOGISTICS AND TRANSPORTATION SECTOR

The transportation and logistics sector indeed forms the foundation of any economy. It is also one of the industries most notorious for wreaking havoc on the environment. Therefore, by standardizing their systems and processes following globally recognized and approved norms, these businesses may maintain the balance between development and environmental sustainability with the aid of ISO Certification:

**Table 4.** Advantages of certification for the Transport and Logistics sector

No	Advantage
1	It elevates your reputation by demonstrating your commitment to meeting international standards of excellence.
2	More systematized delivery of goods, improving your reputation and helping you win new customers and retain your current customers.
3	It improves environmental performance and reduces security risks due to improved management.
4	Make your company capable of trading internationally.
5	Recognizing and managing current and future risks to your business.
6	Take a necessary approach to diminish the impact of incidents.
7	Manifest resilience to customers, suppliers, and tender requests.

**Source:** Own research

Summarizing Ghiani et al. (2004), the effective forward and reverse movement of products, services, and related information from the point of origin to the site of consumption following customer demands is the focus of logistics, a subset of supply chain management. Paraphrasing Kozlenkova et al. (2015), one element that keeps the supply chain together is logistics management. In logistics, resources can be managed in the form of consumables like food and other commodities as well as physical assets like supplies, equipment, and materials.

Logistics is the process of organizing, putting into practice, and overseeing protocols for the safe and efficient movement, storage, and conveyance of goods, services, and related data from the point of origin to the point of consumption, according to the Council of Supply Chain Management Professionals, encompasses inward, outbound, internal, and external movements in order to comply with customer needs (CSCMP, 2016).

In technical terms, global logistics is the process of controlling the "flow" of commodities from their point of production to various locations across the world via a supply chain.

An intermodal transportation system—which includes truck, rail, air, and maritime transportation—is frequently needed for this.

The Logistics Performance Index, an interactive benchmarking tool designed to assist nations in identifying opportunities and challenges in their trade logistics performance and how to improve it, measures the effectiveness of global logistics.

It is based on a global survey of operators on the ground, such as global freight forwarders and express carriers, who provide feedback on the logistics "friendliness" of the nations in which they operate and those countries' respective performance (the countries in which they operate and those with which they trade).



They blend an in-depth understanding of the nations in which they do business with knowledgeable qualitative evaluations of other nations with which they do business and familiarity with the international logistics landscape.

**Table 5.** The categories of the weighted average of a nation's scores.

No	Categories
1	The efficiency of the clearance process (i.e.; speed, simplicity, and predictability of formalities) by border control agencies, including customs.
2	Quality of trade and transport-related infrastructure (e.g., ports, railroads, roads, information technology).
3	Ease of arranging competitively priced shipments.
4	Competence and quality of logistics services (e.g., transport operators, customs brokers).
5	Ability to track and trace consignments.
6	Timeliness of shipments in reaching the destination within the scheduled or expected delivery time.

**Source:** Own research

Quantitative information on the effectiveness of important logistics chain components in the nation of work is added to operator feedback (WB, 2018a).

The results of the LPI are a global general standard for the logistics sector and its consumers, and they have been incorporated into several policy studies and papers created by multilateral organizations (WB, 2018b).

The academic community has also welcomed the LPI results. The weighted average of a nation's scores on six important categories is called the LPI.

## 6. THE OBJECTIVE OF THE CASE STUDY AND THE RESEARCH FRAMEWORK

The level of the ISO Standards Index and Logistics Performance Index, as well as their relationships within a worldwide ecosystem of entrepreneurship, served as the research's framework. Because there aren't many algebraic, statistical, or numerical arguments about the relationships between the LPI and the ISO standards index, this study takes a theory-building approach and looks at the following research questions:

**RQ1:** There is any relation between LPI and the ISO standards index?

Based on this, two hypotheses have been built:

**H<sub>0</sub>:** There is no connection between LPI and the ISO standards index.

**H<sub>1</sub>:** There is a connection between LPI and the ISO standards index.

... taking into account the fact that the literature review of this paper research indicates that there is a dearth of research on the relationship between LPI and ISO standards index, as well as the fact that theoretical approaches to the relationship between LPI and ISO standards index do exist, but there are no quantitative, statistical, or algebraic arguments supporting the relationship.

## 7. METHODOLOGY

In particular, although previous empirical research has acknowledged the significance of quality management and LPI in the business and entrepreneurship ecosystem, it has not explained how these two factors influence and are connected to quality management. This is in addition to the fact that only a small number of rigorous theoretical studies have demonstrated the strong relationship between LPI and ISO standards index; these studies do not include numerical, statistical, or algebraic studies. As a result, a hypothesis that is backed by research and analysis is required. One in-depth case study technique should be used in an exploratory manner to gain a thorough grasp of phenomena and enable a deeper examination of theoretical structures.

### 7.1. Data Collection and Data Analysis

Prior to now, there have been separate data and resources available on the logistics performance index, transit volumes, quality management, and ISO standards. There have also been previously published works, research papers, books, and online libraries. Data for LPI has been gathered from the World Bank LPI Index, and Data for ISO standards has been gathered from the ISO standards website and annual report, A regression analysis was performed, using the ISO standards Index as X and LPI as Y, The ISO standards index has been formed by dividing the total number of ISO certificates issued in a country by the number of businesses in this country, resulting in an ISO standards index (Ceko, 2022), Data for the number of businesses per country have been gathered by HitHorizon (n.d.).

**Table 6.** List of countries based on the Logistics Performance Index (LPI Report) and ISO Standards Index

N <sup>o</sup>	Country	LPI Score	ISO standards Index	N <sup>o</sup>	Country	LPI Score	ISO standards Index
1	Germany	4.2	0.021	25	Poland	3.54	0.00656
2	Sweden	4.05	0.00575	26	Ireland	3.51	0.0136
3	Belgium	4.04	0.00467	27	Hungary	3.42	0.00925
4	Austria	4.03	0.0173	28	Thailand	3.41	0.00505
5	Japan	4.03	0.01123	29	S. Africa	3.38	0.00196
6	Netherlands	4.02	0.0072	30	Slovenia	3.31	0.0127
7	Singapore	4	0.0153	31	Estonia	3.31	0.0071
8	Denmark	3.99	0.0071	32	Israel	3.31	0.018
9	UK	3.99	0.00884	33	Panama	3.28	0.00536
10	Finland	3.97	0.0082	34	Vietnam	3.27	0.0131
11	UAE	3.96	0.01185	35	Iceland	3.23	0.00203
12	Switzerland	3.9	0.022	36	Malaysia	3.22	0.0115
13	New Zeland	3.88	0.00321	37	India	3.18	0.00082
14	France	3.84	0.0054	38	Cyprus	3.15	0.0053
15	Spain	3.83	0.0146	39	Turkey	3.15	0.00132
16	Australia	3.75	0.00576	40	Romania	3.12	0.0144
17	Italy	3.74	0.021	41	Croatia	3.1	0.0149
18	Canada	3.73	0.0052	42	Mexico	3.05	0.00209
19	Norway	3.7	0.00695	43	Bulgaria	3.03	0.0129
20	Czech Rep	3.68	0.0207	44	Slovak Rp	3.03	0.0166
21	Portugal	3.64	0.0114	45	Lithuania	3.02	0.0099
22	Luxembourg	3.63	0.00231	46	Saud Arab	3.01	0.00343
23	Korea. Rep.	3.61	0.0033	47	Brazil	2.99	0.00343
24	China	3.61	0.00434	48	Rwanda	2.97	0.00039

N°	Country	LPI Score	ISO standards Index	N°	Country	LPI Score	ISO standards Index
49	Colombia	2.94	0.00558	80	Malawi	2.59	0.00215
50	Bahrain	2.93	0.0093	81	Cambodia	2.58	0.00028
51	Philippines	2.9	0.00544	82	Uzbekistan	2.58	0.00075
52	Argentina	2.89	0.00951	83	Bangladesh	2.58	0.00126
53	Serbia	2.84	0.0189	84	El Salvador	2.58	0.00147
54	Ukraine	2.83	0.00121	85	Uganda	2.58	0.00014
55	Egypt	2.82	0.00094	86	Tunisia	2.57	0.00212
56	Kenya	2.81	0.00022	87	Ghana	2.57	0.00317
57	Malta	2.81	0.00596	88	Kyrgyz Rep	2.55	0.01179
58	Latvia	2.81	0.01173	89	Morocco	2.54	0.01886
59	Kazakhstan	2.81	0.002	90	Zambia	2.53	0.00004
60	B&H	2.81	0.0195	91	Jamaica	2.52	0.00406
61	Costa Rica	2.79	0.00428	92	Nepal	2.51	0.00016
62	Benin	2.75	0.01044	93	Moldova	2.46	0.0012
63	Montenegro	2.75	0.0146	94	Algeria	2.45	0.00034
64	Mauritius	2.73	0.00203	95	Togo	2.45	0.00036
65	Lebanon	2.72	0.00354	96	Georgia	2.44	0.01136
66	Brunei DRSL	2.71	0.0169	97	Sudan	2.43	0.00833
67	NR Macedonia	2.7	0.0191	98	Chad	2.42	0.0082
68	Lao PDR	2.7	0.00054	99	Imd&Tbg	2.42	0.0048
69	Peru	2.69	0.00162	100	Guatemala	2.41	0.0164
70	Jordan	2.69	0.00282	101	Tajikistan	2.34	0.008
71	Uruguay	2.69	0.0088	102	Lesotho	2.28	0.00006
72	Dominic Rep	2.66	0.00311	103	Senegal	2.25	0.00046
73	Albania	2.66	0.0043	104	Guinea	2.2	0.00595
74	Djibouti	2.63	0.00882	105	Iraq	2.18	0.00721
75	Burkina Faso	2.62	0.00044	106	Bhutan	2.17	0.00189
76	Armenia	2.61	0.00124	107	Haiti	2.11	0.00008
77	Honduras	2.6	0.00143	108	Sierra Ln	2.08	0.0004
78	Sri Lanka	2.6	0.0019	109	Niger	2.07	0.00698
79	Cameroon	2.6	0.00046	110	Angola	2.05	0.00251

Source: Logistics Performance Index taken from WB, 2018a;  
ISO Standards Index - Own calculations

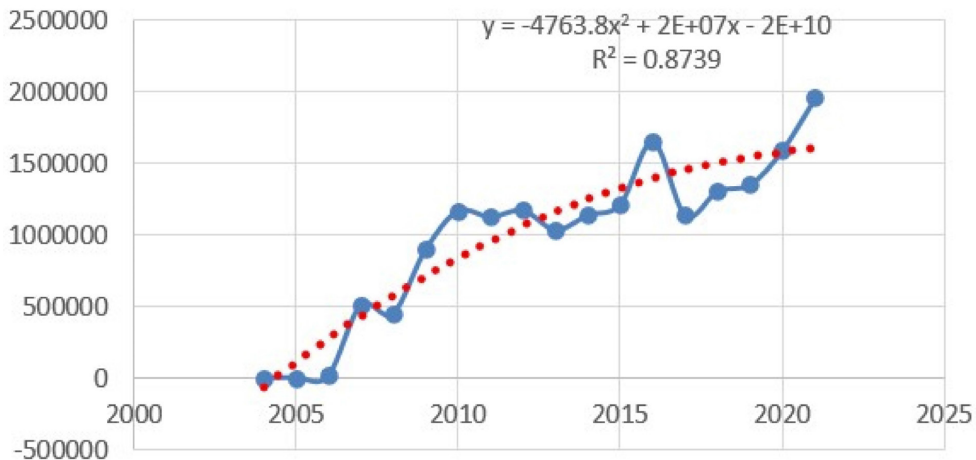
**Table 7.** ISO certificates issued worldwide between 2007 – 2021  
(ISO) (drawn from the author of this paper)

		Year				
		2007	2008	2009	2010	2011
ISO	9001	420582	358612	694585	910041	856505
	13485	12985	13234	16425	18834	19849
	14001	64172	62118	161795	205209	216151
	20000					
	20121					
	22000	4122	8185	13837	17929	17735
	22301					
	27001	7732	9246	12935	15178	16800
	28001					
	29001					
	37001					
	39001					
	44001					
	45001					
	50001					634
	55001					
	<b>Total</b>	509593	451395	899577	1167191	1127674

		Year				
		2012	2013	2014	2015	2016
ISO	9001	865456	755632	818779	842093	1116227
	13485	22317	25655	26280	26255	29585
	14001	243168	206538	234964	261852	409466
	20000				2778	4537
	20121					
	22000	21158	24207	27685	32050	32130
	22301			1764	3133	3853
	27001	18920	21604	23005	27536	33290
	28001					356
	29001					
	37001					
	39001					478
	44001					
	45001					
	50001	2120	3471	6914	20562	23377
	55001					
<b>Total</b>		1173139	1037107	1139391	1216259	1653299

		Year				
		2017	2018	2019	2020	2021
ISO	9001	758344	878664	880,007	916842	1077884
	13485	31520	19472	23045	25656	27229
	14001	251315	306596	312111	348473	420433
	20000	5005	5330	6044	7846	11769
	20121					253
	22000	32722	32120	33500	33741	36124
	22301	4281	1506	1692	2205	2559
	27001	39501	31910	36337	44499	58687
	28001	494	617	1,874	520	584
	29001					157
	37001		778	1,738	4130	5792
	39001	620	547	864	972	1285
	44001					136
	45001		11952	38518	190481	294420
	50001	13827	18059	18209	19731	21907
	55001					488
<b>Total</b>		1137629	1307551	1,353,939	1595096	1959707

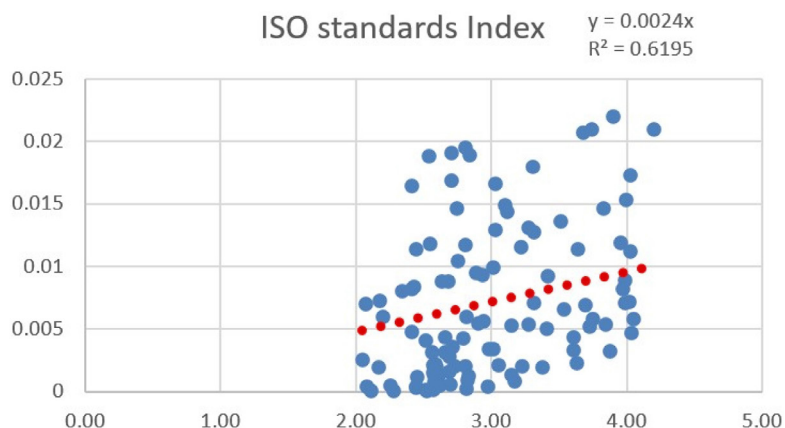
Source: Own research



Graphic 1. Total ISO certificates issued worldwide 2004 – 2021.

Source: Own processing

In the graphic below a correlation analysis, in a graphical mode is given, where is shown there is no connection/relation between the SDG Index and the ISO Standards Index.



**Graphic 2.** Correlation between the LPI and the ISO Standards Index

Source: Own calculations

The statistical data on missing links or relationships between the ISO Standards Index and the LPI Index are shown in the three tables below. R2 = 0.280905 indicates a poor connection or relationship between these two Indexes.

**Table 8.1, 8.2 and 8.3.** Regression analysis

SUMMARY OUTPUT	
<i>Regression Statistics</i>	
Multiple R	0.783874
R Square	0.614458
Adjusted R Square	0.605199
Standard Error	1.892383
Observations	109

ANOVA					
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>
Regression	1	616.4006	616.4006	172.1254	5.13E-24
Residual	108	386.7602	3.581113		
Total	109	1003.161			

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95.0%</i>	<i>Upper 95.0%</i>
Intercept	0	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
0.021	263.2612	20.06616	13.11966	4.32E-24	223.4866	303.0358	223.4866	303.0358

Source: Own processing

With the help of these findings, the practical relationship between the ISO Standards Index and the LPI Index has been confirmed.

## 8. DISCUSSION

The Transport and Logistics industry is one of the most important sectors of any economy and also one of the sectors that cause the most irreparable damage to the environment, but this industry can maintain the balance between development and sustainability by applying the ISO standard to standardize the system. processes, procedures, record keeping, etc., according to internationally recognized and accepted norms. This was also the main reason for the realization of this study, which statistically verified, through regression analysis, the relationship that exists between the LPI Index and the ISO Standards Index. We all agree that LPI can be attained through an improved process of ISO standards certification on a global scale, but how can we better integrate LPI with QMSs and ISO standards in particular? ISO standards are highly standardized and aid in the scientific management of production

factors, as well as the creation, maintenance, and ongoing improvement of long-term sustainable development of the logistics and transport industry, which also contributes to ensuring supply chain management and operation for present and future generations. This research provides proven statistical knowledge on the relationship between transport logistics on the one hand and quality management on the other, suggesting that successful business organizations should invest in quality management, especially ISO standards to improve the continuity of their logistics to achieve competitive advantage. The use of regression analysis in this paper scientifically expresses the existence of relationships between the issues of commercial logistics, expressed by the index of logistics performance and quality management, expressed by the index of ISO standards, but this was realized for a specific period and only half of the world's countries. This is because the data on these issues do not exist, are missing, or require more time and resources to be realized, while more exploratory actions are required on the relationship between the logistics performance index and the ISO standards index worldwide and for a wide period. For the future, the main implication is the development of a powerful tool that combines quality management and logistics, achieving a competitive advantage and other parameters/indicators to better understand their implications and importance in the matter of logistics. The value of investing in soft factors of production such as innovation, creativity, quality management, etc., to achieve a competitive advantage in general and in the logistics and transport sector in particular, is very important as hard factors of production such as labor, land, and capital, have also. In this regard, the most requested ISO standards that are suitable for the transport and logistics industries are:

- ISO 9001 – Quality Management
- ISO 14001 – Environment Protection
- ISO 22301 – Business Continuity
- ISO 39001 – Road Traffic Safety Management
- ISO 45001 – Health and Safety at Work ...

... etc., explained in more detail above.

### **Consequences for Theory and Application**

According to the idea, a new avenue for investigation into the relationships between supply chain management, quality control, transportation, logistics, and, particularly, the LPI Index and ISO Standards Index, has been made possible by the research's conclusive findings.

### **Contribution**

The contribution of this critical analysis article on the field of relations between transport, logistics, supply chain management, and ISO standards shows that, investigating carefully the issue of building relations between important concepts and principles like those of LPI and Quality management principles too. The economic and social significance of ISO and LPI standards is emphasized in this critical analysis piece for both present and future generations.

### **Limitations and Further Research**

This study has been conducted using a large amount of LPI Index data and is the first to provide ISO standards Index data. To establish the validity of these relationships and turn LPI and ISO standards into effective global instruments for raising living standards, more study is required. Summarizing [Beysenbaev and Dus \(2020\)](#) and [Raimbekov et al. \(2017\)](#), several studies have observed that the LPI tends to be skewed and undervalues some countries with a statistically better logistics system due to its methodology, which consists of subjective responses from various logistics operators. Paraphrasing [Guner and Coskun \(2012\)](#), furthermore, research indicates that social variables have a greater effect on the LPI than economic ones.

## 9. CONCLUSION

This research provides proven statistical knowledge on the relationship between transport logistics on the one hand and quality management on the other, suggesting that successful business organizations should invest in quality management, especially ISO standards to improve the continuity of their logistics to achieve competitive advantage. With the help of these findings, the practical relationship between the ISO Standards Index and the LPI Index has been confirmed. The use of regression analysis in this paper scientifically expresses the existence of relationships between the issues of commercial logistics, expressed by the index of logistics performance and quality management, expressed by the index of ISO standards, for a specific period and only half of the world's countries. For the future, the main implication is the development of a powerful tool that combines quality management and logistics, achieving a competitive advantage and other parameters/indicators to better understand their implications and importance in the matter of logistics. The value of investing in soft factors of production such as innovation, creativity, quality management, etc., to achieve a competitive advantage in general and in the logistics and transport sector in particular, is very important as hard factors of production such as labor, land, and capital, have also. Scientific management of factors of production requires ISO standards application, so, a connection and relations between the transport, logistics, and supply chain management, LPI, and ISO standards Index that exist, should be promoted for a healthier transport and logistics ecosystem for all. Using quality management principles and ISO standards as effective and efficient tools will help all interested parties, including individuals, public and private institutions, decision-makers, and civil society, achieve and maintain sustainable development scenarios in the transportation and logistics sector. As a pressing need, all parties should ensure that the already-existing relationships and connections between LPI and ISO standards are strengthened and put to practical use. Improving the quality management system and adhering to ISO standards in tandem with efforts to achieve sustainable growth in the transportation and logistics sectors would really reflect improvements in the standard of living on a global scale. Regarding the idea, a new avenue for investigation into the relationships between supply chain management, quality control, transportation, logistics, and, particularly, the LPI Index and ISO Standards Index, has been made possible by the research's conclusive findings.

## References

- Beysenbaev, R., & Dus, Y. (2020). Proposals for improving the Logistics Performance Index. *The Asian Journal of Shipping and Logistics*, 36(1), 34-42. <https://doi.org/10.1016/j.ajsl.2019.10.001>
- Ceko, E. (2022). A new approach to evaluate the index of ISO 9001. *SocioEconomic Challenges*, 6(3), 5-22. [https://doi.org/10.21272/sec.6\(3\).5-22.2022](https://doi.org/10.21272/sec.6(3).5-22.2022)
- CSCMP. (2016). Glossary. Retrieved January 30, 2023.
- Ghiani, G., Laporte, G., & Musmanno, R. (2004). Introduction to Logistics Systems Planning and Control. John Wiley & Sons. ISBN 9780470849170.
- Guner, S., & Coskun, E. (2012). Comparison of impacts of economic and social factors on countries' logistics performances: a study with 26 OECD countries. *Research in Logistics and Production*, 2(4), 329–343.
- HitHorizon. (n.d.). <https://www.hithorizons.com/>. Retrieved January 14, 2023.
- ISO. (2018). Contributing to Sustainable Development Goals with ISO standards (ISBN 978-92-67-10790-5).
- Kozlenkova, I. V., Hult, G. T. M., Lund, D. J., Mena, J. A., & Kekec, P. (2015). The Role of Marketing Channels in Supply Chain Management. *Journal of Retailing*, 91(4), 586-609. <https://doi.org/10.1016/j.jretai.2015.03.003>

- Raimbekov, Z., Syzdykbaeva, B., Mussina, K., Moldashbaeva, L., & Zhumataeva, B. (2017). "The study of the logistics development effectiveness in the Eurasian Economic Union countries and measures to improve it." *European Research Studies Journal*, 4B, 260–276.
- WB. (2018a). LPI Report. Retrieved January 30, 2023.
- WB. (2018b). Connecting to Compete 2018: Trade Logistics in the Global Economy - The Logistics Performance Index and its Indicators. Retrieved January 30, 2023.

### Additional reading

- ISO. (2020). ISO Survey Executive Summary, <https://www.iso.org/the-iso-survey.html>
- ISO Survey. (2021). <https://www.iso.org/the-iso-survey.html>
- ISO. (2022). Get ISO for transport and logistics. <https://www.siscertifications.com/transport-logistics/> . Retrieved January 30, 2023.
- ISO. (2022). ISO standards and transport. <https://www.iso.org/moving-from--a-to-b.html>. Retrieved January 30, 2023.
- ISO. (2022). Moving goods with ISO standards. <https://www.iso.org/news/ref2227.html>. Retrieved January 30, 2023.





# Current Challenges Affecting the Development of Human Resources in Slovakia

Iveta Dudová<sup>1</sup>   
Silvia Matúšová<sup>2</sup> 

Received: August 14, 2023  
Accepted: November 13, 2023  
Published: March 16, 2024

## Keywords:

Human capital;  
Human resources;  
Knowledge economy;  
Digital transformation



Creative Commons Non Commercial CC BY-NC: This article is distributed under the terms of the Creative Commons Attribution-Non-Commercial 4.0 License (<https://creativecommons.org/licenses/by-nc/4.0/>) which permits non-commercial use, reproduction and distribution of the work without further permission.

**Abstract:** *The paper defines the key factors influencing human resources in the current economic development in Slovakia and points to possible ways of adapting human capital to the rapidly changing world. The paper aims to characterize the expected features of the foreseen digital and knowledge transformation of the Slovak economy and society and to identify possible paths of human resource development, based on the definition of the knowledge economy and the learning society.*

## 1. INTRODUCTION

Digital transformation consists of several waves through which new disruptive technologies are fundamentally changing and will continue to change the ways businesses operate and the associated economic impact of these changes. New technologies can improve several internal and external business processes, especially relationships with customers, employees, and suppliers. Digital transformation should bring added value for the entrepreneur.

Investments in human capital are essential to ensure that people are part of the solutions being adopted. The human aspect is essential for success in digital transformation. Enterprises that use more specific digital technologies are likely to achieve higher average labour productivity and total sales, and create a higher average number of jobs, compared to those that do not use them.

Digital transformation affects the development of human capital and human resources. Human capital represents all the skills, knowledge, abilities, and experiences that enable an individual to occupy a position at a certain level within a society or community. Human capital is the main resource of profit and value creation in successful and high-performing organizations. It is a fundamental aspect of human resources management procedures.

## 2. HUMAN CAPITAL IN THE KNOWLEDGE AND DIGITAL ECONOMY – BASIC FRAMEWORKS

As stated by Dudová (2022), in relation to the knowledge economy, we assume that the basic source of wealth creation lies in knowledge and competences. The transition to a knowledge-based economy indicates the development of an economy in which knowledge is an important factor in economic growth, while the evolution of the organization of agents in the

<sup>1</sup> Bratislava University of Economics and Management, Furdekova 16, 85104 Bratislava, Slovak Republic

<sup>2</sup> Bratislava University of Economics and Management, Furdekova 16, 85104 Bratislava, Slovak Republic

dynamics of knowledge creation acquires great importance, even regarding the increase of the quantity of knowledge. Investments contained in knowledge make it possible to increase classic factors of production, such as labour, capital, raw materials, and energy. Competitiveness depends on the accumulation of knowledge and its quick and effective mobilization in the process of production of goods and services.

The emergence and growth of the diffusion of information and communication technologies represent the factors of the knowledge-based economy. Information technologies strengthen the intensity and variety of knowledge. The digital economy can be defined as all activities related to information and communication technologies (ICT) and the production and sale of digital products and services. The global economy is characterized by the transition to the fourth industrial revolution (Industry 4.0), which is accelerated precisely by digital transformation and global trends. Digital transformation is a process that is pursued by an organization when integrating digital technologies into all areas of business.

Each component of human capital affects other components; competences are based on individual characteristics, attitudes, abilities, and knowledge. They cannot exist if one of the components of human capital is missing. The concept of competence appeared in connection with the transformation of necessary knowledge into individual activities in new forms of work organization. An important task is the integration of knowledge and information into the standard economy. Skills and lifelong learning are fundamental factors in terms of competitiveness. Having the relevant skills means the ability to keep a job and handle job changes more easily.

Technological changes and the digital transition are causing a shift in the demand for skills. Skills increasing the workforce's ability to adapt to rapid changes in the economy and society include soft skills, STEM (Science, Technology, Engineering and Mathematics) skills and digital skills. Digital transformation affects all aspects of the labour market and life. Digital skills are important because they are fundamental to human interaction and modern work. For many professions, digital skills are simply foundational life skills.

Digital technologies as technologies with general applications affect all sectors of the economy. Digitization, like previous technological progress, will also have an impact on labour markets. Some jobs will be replaced, some jobs will be created, and many jobs will change.

The importance of digital technologies is growing namely for labour productivity, digital skills are becoming a driving force for employability. Most jobs require at least basic digital skills. Education and training policies, including the context of lifelong learning, tend to ensure that the workforce possesses the right skills to thrive in the digital world. As stated by [Dudová \(2022\)](#), a learning society corresponds to a universal society, which emphasizes the necessity for lifelong learning, especially regarding changes in technologies and jobs.

As stated by [CEDEFOP \(2022, p. 36\)](#), the complementarity between skills and digital technologies is manifested, the more qualified occupations are more digitally intensive. Digitally demanding jobs also require a higher complementarity of basic skills (e.g., literacy, numeracy), cognitive skills (e.g., problem-solving, creativity), and social skills.

The rapid change in the requirements for technical skills at work which has been observed in recent decades - reflecting the obsolescence and the necessity for the renewal of skills - indicates that the

pace of introduction of new technologies in the performance of work activities is high. According to the [European Commission \(2017\)](#), the challenges of digitization in the field of employment include a) replacement of jobs (some types of jobs may be replaced during the digital transformation of the economy); b) this may be most relevant to middle-level jobs (increased efficiency due to ICT has reduced the number of routine jobs in the middle part of the income distribution); c) the need to adapt.

### 3. IMPACT OF THE ANTICIPATED DIGITAL AND KNOWLEDGE TRANSFORMATION ON HUMAN RESOURCES IN THE SLOVAK REPUBLIC

The current development in the economy and society in the Slovak Republic brings in new technologies, innovations and trends that dynamically change the world and affect all areas of life. Informatization and digitization are changing the way economic value is created, the structure and functioning of markets, and ultimately how all relationships – economic and social – are created and developed. These changes are ongoing and affect an increasingly broad range of processes that are crucial for the functioning of businesses.

In terms of employment structure, out of the total number of approximately 2,604,000 workers, legislators and managers make up more than 5%, specialists and technicians, and professional workers make up 32%.

**Table 1.** Workers in the Slovak Republic according to the SK ISCO-08 employment classification (in thousands of persons)

Employment	2019	2022
1 Legislators, management workers	127,9	148,0
2 Specialists	348,9	411,5
3 Technicians and professional workers	406,0	438,1
4 Administrative workers	245,5	259,2
5 Workers in services and trade	475,7	435,4
6 Qualified workers in agriculture, forestry, and fishing	28,3	25,7
7 Skilled workers and craftsmen	407,9	384,7
8 Operators and fitters of machines and equipment	350,9	337,5
9 Helpers and unskilled workers	179,4	147,6
10 Members of the armed forces	13,3	15,2
Workers together	2 583,7	2 603,9

Source: Statistical Office of the Slovak Republic, 2023

It is assumed that with the advent of digitalization, many work processes will be automated and artificial intelligence will replace many activities. Achieved savings in human resources can create space for the emergence of new professions servicing new processes. Out of the total number of workers in the Slovak Republic, approximately 32% have a university education.

**Table 2.** Workers by education in the Slovak Republic (in thousands of persons)

Level of education	2019	2022
Primary	106,7	70,9
Vocational secondary (apprenticeship) without graduation	606,2	553,4
Complete secondary vocational (apprenticeship) with graduation	174,9	146,8
Complete secondary general education	104,7	109,7
Complete secondary vocational education	864,2	876,7
Upper secondary vocational education	22,2	20,1
University education – 1 <sup>st</sup> degree	81,7	101,6
University education – 3 <sup>rd</sup> degree	25,7	29,0
Without school education	-	0,3
Total	2 583,7	2 603,9

Source: Statistical Office of the Slovak Republic, 2023

In terms of employment status, employees make up 85% of the total number of workers and entrepreneurs 15%.

**Table 3.** Workers by employment status (in thousands of persons)

Employment status	2019	2022
Employees together	2 195,0	2 214,4
Employees in the public sector	695,3	728,4
Employees in the private sector	1 499,7	1 485,9
Employees in a state enterprise	695,3	728,4
Employees in a private company	1 452,0	1 437,7
Employees in a cooperative organization	30,3	21,6
Employee in another type of organization	17,4	26,6
Self-employed together	388,7	389,6
Entrepreneurs together	386,6	388,4
Entrepreneurs without employees	309,5	319,0
Entrepreneurs with employees	77,2	69,5
Helping members of the entrepreneurs' households	2,1	1,1
Workers together	2 583,7	2 603,9

**Source:** Statistical Office of the Slovak Republic, 2023

When analysing the potential of automation of internal company processes because of technological progress (robotization, artificial intelligence, digitization, etc.), it is always necessary to keep in mind basic economic laws. The fact that some parts of the process can be replaced by technology does not mean that it will happen. Even in times of technological progress, the company makes decisions based on profit, i.e., the difference between revenues and costs.

When intending to implement a specific technology in the production process, the company tries to influence the cost item. If the costs of the technology (investment and operating) are higher than the costs of human labour, the implementation of the technology may not be profitable for the company. Of course, other factors also enter this decision, such as the flexibility of capital and human labour (how operationally we can change process parameters), or the strategic intentions of companies.

Capital investment is frequently an investment with a long-term return and thus represents a certain amount of risk for businesses. Sometimes, companies, especially those without long-term strategic intentions, or full power over their future (they produce largely for other sectors and not for final consumers), do not pay to undertake an investment that in the more distant future will bring production efficiency at the expense of current profits.

According to the [Strategy for the development of human resources in the administration, economy, and management sector until 2030 \(2020\)](#), the main cost item of human labour is wages, which are the result of demand and supply in the labour market. If companies start to implement technologies replacing human labour on a larger scale and at the same time there is no demand for these workers elsewhere (in the Slovak economy), the wages for which these workers are willing to work will decrease at the same time.

This can again slow down technology implementation, as human labour becomes more profitable for the business than it was before technology implementation. This market principle and the profit motivation of businesses may prevent automation and robotization from having an extreme knock-on effect on the labour market and employees.

The most significant factors that affect the economic and social environment in the Slovak Republic include the increase in the competitive environment through innovative business models and digital solutions with an impact on the necessary qualifications to operate the solutions, the effects of fluctuations in the world and European economy, the defining of technology development trends along with the shift of the role Slovakia plays in supply chains, the need for manpower, public investments in research and development and the increase of lifelong learning rate. Economic factors include significant increases in productivity through technological change, lack of available skilled labour, and flexible work opportunities.

Digitalization and electronicization belong among the technological factors. Digitization in the field of services supports the erasure of geographical distances. Electronicization requires the increased qualification level of employees when performing specific activities in this area. With the advent of digitalization, many processes will be automated and artificial intelligence will replace a considerable number of activities in the sphere of administration, economy, and management. Predicted key innovation and technological changes in this decade that will impact human resources include digital ecosystems, advanced artificial intelligence and analytics, automation, Big Data, digitization, digital security, Internet of Things (IoT), communication networks of new generation, robotization, development of information technologies, artificial intelligence, etc.

The technological trends will manifest an accelerating impact on the entire economy and society that will continue to grow. The production processes and services of the modern Slovak economy will be subject to an increasingly high degree of digitization, virtualization, automation and robotization. Digitization and Industry 4.0 will require a deeper connection of ICT and business skills in the creation of innovative solutions.

Social factors affecting the labour market include mainly the demographic development of the workforce in terms of the availability of the workforce and the distribution of the qualification structure, especially in those sectors where the decline is most evident. In addition, experience shows that the presence of foreign workers in the labour market puts pressure on the adoption of new digital services and models from abroad.

As stated by the [Strategy for the development of human resources in the administration, economy, and management sector until 2030 \(2020\)](#), the legislative factors include, inter alia, the regulatory conditions for entry into the profession which must reflect the possibilities manifested by digital solutions, the support for the digital solutions in common commercial practice in the form of accelerating the digitization process in enterprises and the pressure for the transformation of the workforce.

Economic, technological, social, and legislative factors will influence the demand for specific employees or the required educational structure of the workforce in the future. Technological progress, together with the development of the sharing economy, will mean a significant transformation of the work environment. The mentioned innovations will have an impact on a wide range of jobs, even with the expected creation of new jobs in connection with the innovations.

Current technological and digital innovations will significantly affect the development of human resources. In this direction, several digital innovations are entering the processes, which have the potential to bring a breakthrough in the content of many professions. Not every innovation affects

individual sectors to the same extent. For example, certain professions will be replaced by artificial intelligence, which will create a substitute demand, especially for the skills of operating new software or systems which will represent the important competitiveness factor on which companies will depend. Technological changes will have a significant impact on the demand for professions with high added value and especially for the type of professional qualifications and IT skills.

#### **4. HUMAN RESOURCES DEVELOPMENT TOWARDS THE KNOWLEDGE AND DIGITAL ECONOMY**

Technological changes will have significant effects in relation to the demand for professions with high-added value. Technical skills in the areas of new technology management, programming and engineering are expected to come to the fore. The need for the development of soft skills and their innovation is expected, and the development of future competencies (characteristics, attitudes, innate or acquired knowledge and personal abilities leading to excellent performance). The understanding of competence is no longer tied to a specific qualification but goes beyond it.

It is assumed that the importance of competencies such as creative thinking, emotional intelligence, analytical skills (critical thinking), the ability for continuous learning and personal development, decision-making skills, and the ability to lead will grow. Digital communication, online internal and external communication, communication and project management, online education, leadership, and management were identified as innovations aimed at soft skills development.

According to the [Ministry of Finance of the Slovak Republic \(2022\)](#), public policies aimed at productivity increase will support digitization, including the completion of the infrastructure in areas not covered by the market, the improvement of digital skills of the current and future workforce, commissioning of effective electronic public administration that will provide services for citizens and entrepreneurs. Digitization will also take place in the field of healthcare, the judiciary, construction proceedings, the activities of Social Insurance, the fight against corruption, and the safety of the population. Digitization in education refers to the completion of the school's digital infrastructure and the strengthening of the digital skills of students in the new curriculum reform, including the preparation and professional development of teachers.

Building a high-quality digital infrastructure with the setting of rules for the use of open data by the private sector and non-profit organizations is considered an important aspect of supporting future development. Infrastructure development must also include investments in the workforce as a form of support for industry and modern digital services.

As stated by the [Strategy for the development of human resources in the sector of information technology and telecommunications until 2030 \(2020\)](#), the response of the Slovak educational system to innovations can be summarized as follows. Schools are adapting to digitization in education by changing teaching methods and forms, and applying distance and hybrid forms of education. The transition to distance learning required a reassessment of educational content - key skills are strengthened, and unnecessary content is reduced.

However, state educational programs do not respond sufficiently to innovations and the transition to distance education. The disproportion between the formal framework established by the state educational program and the real educational process in schools is growing. The shortage

of computer science teachers is causing schools to skip teaching this subject. Despite this, the founders of schools do not consider the lack of informatics teachers to be a serious problem as primary and secondary schools have a small number of informatics hours, which is not enough to employ a full-time qualified teacher, so the lessons are covered by unqualified teachers.

New technologies will permeate the economy and society. The transformation of the economy into a knowledge-based and digitally oriented one will require a massive transformation of knowledge and skills in STEM fields. The global impact of technological trends fundamentally changes the nature of work processes and operations, thereby creating the need for qualitative changes in IT skills and competencies. For that reason, systemic changes in all pillars of life-long education are necessary.

From the aspect of a strategic approach to the development of human resources, it is necessary to place particular emphasis on the following measures in the Slovak Republic:

- It is necessary to transform the educational system towards the acquisition of competencies necessary for the digital age. This includes, for example, defining a national standard for digital school, primary and secondary schools; comprehensive education and training of pedagogical and school employees in the transformation of education and schools for the digital age; legislatively and institutionally ensuring the recognition of partial qualifications in the ICT, digital and soft skills acquired through formal and informal education, as well as the acquisition of practical skills.
- Update, innovate and modernize the content of education towards the development of competences in pre-school education, primary, secondary, and higher education as well as in further education (e.g., strengthen the possibility of retraining adults in advanced digital and information technologies with their development over time).
- Improve and harmonize the infrastructure and technical equipment of educational institutions with technological trends.
- Initiate changes in the system of training and education of teachers, educators and lecturers of further education according to the requirements of the digital age.
- Build a culture of cooperation and networking to support the digitization of the society at large.
- Increase the motivation of the public, companies, and institutions to adopt and use new technologies and improve the awareness of the digital economy.

The global impact of technological trends and digitization creates an increased demand for a skilled IT workforce. Rapidly changing technological trends and the demands of the labour market make it difficult for the educational system to adequately adapt to these changes. The current resources of IT trained and prepared workforce, not only for the IT and telecommunications sector, but also for other sectors, are sufficient neither qualitatively nor quantitatively to cover the needs of the labour market, and this deficit will increase over time.

Many employers perceive the deterioration of the education system (with low flexibility and high inertia) to adapt to the rapidly changing demands of the labour market. In particular, the ICT sector requires the digital transformation of education and the introduction of fundamental innovations, such as a change of the paradigm of the educated individual as a subject of education to an object of education; a change in the perception of learning as a lifelong need of the individual, which enables to find the place in the world of work (the individual must take responsibility for his own education); opening and making educational systems and educational paths more flexible; wide use of digital and virtual learning environments; personalized and hybrid learning.

As part of other expected systemic changes in the system of lifelong education, the important change should relate to the development of mathematical and financial literacy, and soft skills acquisition, starting from preschool education. At universities, the development of STEM fields should be supported, and the increase of knowledge and practical use of information resources in study programs and specialized digital technologies, software and applications should be promoted.

## 5. CONCLUSION

Globalization, permanent and continuous progress in new technologies and the development of the knowledge economy are factors that force organizations of all kinds to innovate their work and management practices. However, the success of these innovations depends on the ability to rely on a healthy, skilled, and flexible workforce. Companies are embracing digital transformation to gain competitive advantage and relevance in the respective sector.

An important factor for the successful handling of future technological, social and economic challenges is an active, predictive and trend-aligned educational system and all educational activities (formal, informal and nonformal) in the context of the necessity of lifelong learning.

The development of human resources consists of the development of all characteristics of the organization's employees. It generally refers to the development of human capital, which aims to enable employees to improve their skills, know-how and competences. Technological progress in the workplace has a significant impact on the development of human resources. The problem of skills development in the internal environment of organizations and businesses will become more and more persistent, and their ability to evolve and adapt will become more and more important over time, as the digital transformation gradually comes in subsequent waves.

Social stakeholders (individuals, companies, the state) who deal with the generation and acquisition of knowledge, as well as the use and recognition of knowledge, should have a stake in the management of knowledge and education.

## Acknowledgment

This research was supported by the Bratislava University of Economics and Management, [3/2021-M Managerial Competencies and Innovations in Education in Post-COVID 19, and 1/2022 Social Inequalities].

## References

- CEDEFOP. (2022). Setting Europe on course for a human digital transition. Available at: [https://www.cedefop.europa.eu/files/3092\\_en.pdf](https://www.cedefop.europa.eu/files/3092_en.pdf)
- Dudová, I. (2022). *Ekonomía vzdelávania*. 2022. Prague, Czech Republic: Wolters Kluwer.
- European Commission. (2017). A concept paper on digitisation, employability and inclusiveness, the role of Europe. Available at: [https://ec.europa.eu/newsroom/document.cfm?doc\\_id=44515](https://ec.europa.eu/newsroom/document.cfm?doc_id=44515)
- Ministry of Finance of the Slovak Republic. (2022). Národný program reforiem Slovenskej republiky 2022. Available at: <https://www.mfsr.sk/files/sk/financie/institut-financnej-politiky/strategicke-materialy/narodny-program-reforiem/npr-2022.pdf>



- Statistical Office of the Slovak Republic. (2023). Datacube. Available at: [https://datacube.statistics.sk/#!/view/sk/VBD\\_SLOVSTAT/pr2053qs/v\\_pr2053qs\\_00\\_00\\_00\\_sk](https://datacube.statistics.sk/#!/view/sk/VBD_SLOVSTAT/pr2053qs/v_pr2053qs_00_00_00_sk)
- Strategy for the development of human resources in the administration, economy, and management sector until 2030. (2020). árodný projekt Sektorovo riadenými inováciami k efektívnemu trhu práce v Slovenskej republike. Bratislava, Slovak Republic: Sektorová rada verejné služby a správa. Available at: <https://www.sustavapovolani.sk/strategie/prehľad-strategii/>
- Strategy for the development of human resources in the sector of information technology and telecommunications until 2030. (2020). Národný projekt Sektorovo riadenými inováciami k efektívnemu trhu práce v Slovenskej republike. Bratislava, Slovak Republic: Sektorová rada verejné služby a správa. Available at: <https://www.sustavapovolani.sk/strategie/prehľad-strategii/>





## Slovak Self-Government'S Gender Policy

Dagmar Petrušová<sup>1</sup>   
Jana Sochuláková<sup>2</sup>   
Katarína Kráľová<sup>3</sup> 

Received: June 16, 2023  
Revised: December 22, 2023  
Accepted: January 3, 2024  
Published: March 16, 2024

### Keywords:

Self-government;  
Gender politics;  
Self-governing region



Creative Commons Non Commercial CC BY-NC: This article is distributed under the terms of the Creative Commons Attribution-Non-Commercial 4.0 License (<https://creativecommons.org/licenses/by-nc/4.0/>) which permits non-commercial use, reproduction and distribution of the work without further permission.

**Abstract:** *Gender inequality is a complex phenomenon whose impacts and consequences affect every area of society. Although as a rule the disadvantages concern women, in some cases gender stereotypes have an adverse impact on men as well. The goal of gender equality is to create a respectful space for every woman and every man so that they can realize themselves in life according to their wishes and abilities and not be limited by gender stereotypes. Despite indisputable progress in equal opportunities for men and women in the Slovak Republic, inequalities persist in almost all areas of private and public life. The following contribution aims to present the differences and changes in the representation of women in elected positions of selected self-governing entities in the Slovak Republic.*

## 1. INTRODUCTION

Territorial self-government is a spatially defined functional unit that has the right to decide on its own affairs. An example of territorial self-government in Slovakia are municipalities, as basic territorial self-governing units. Their right to self-government is enshrined in the Constitution of the Slovak Republic and defined in more detail in the Act on Municipalities. Self-governing units create their bodies through which self-government is carried out. The Constitution in chapter no. 4 also stipulates that the territorial self-government in the Slovak Republic consists of a municipality and a higher territorial unit. Territorial self-government is a part of public administration, usually in issues of local importance, which is carried out not by the state, but by the population of territorial units or certain bodies of territorial units.

In Slovakia, the territorial self-government has two levels (municipality/city and VUC) and is mainly enshrined in the fourth title of the Constitution of the Slovak Republic (Article 64 - Article 71). According to this title:

- Territorial self-government consists of a municipality and a higher territorial unit.
- Municipalities and higher territorial units are independent, self-governing, and administrative units, legal entities with their own property and financial resources, obligations can be imposed on them only by law.

Territorial self-government is carried out at assemblies of the inhabitants of the village, by local referendums, by referendums on the territory of a higher territorial unit, by the authorities of the municipality, or by the authorities of a higher territorial unit. The authorities of the municipality are the mayor and the council, the authorities of the VÚC are the chairman of the VÚC

<sup>1</sup> Alexander Dubček University of Trenčín, Faculty of Social and Economic Relations, Študentská 3, 91150, Trenčín, Slovak Republic

<sup>2</sup> Alexander Dubček University of Trenčín, Faculty of Social and Economic Relations, Študentská 3, 91150, Trenčín, Slovak Republic

<sup>3</sup> Alexander Dubček University of Trenčín, Faculty of Social and Economic Relations, Študentská 3, 91150, Trenčín, Slovak Republic

and the council; the performance of state tasks can also be transferred to them under the conditions set by the constitution and laws.

Territorial self-government is divided as follows:

- local territorial self-government (in Slovakia, municipalities, and towns),
- regional territorial self-government (in Slovakia, higher territorial units).

A municipality is made up of one or more settlements. Its territory is made up of at least one cadastral territory. It brings together the citizens who reside permanently in its territory. Some municipalities in Slovakia have the status of a city. There are currently 2 891 municipalities in Slovakia, of which 138 are towns. Municipalities have municipal councils elected by the citizens and towns have town councils elected by the citizens. They are headed by a mayor.

The following contribution aims to present the differences and changes in the representation of women in elected positions of selected self-governing subjects in the Slovak Republic.

## 2. REPRESENTATION OF WOMEN AT THE CENTRAL LEVEL

Politics has traditionally been reserved for men, meaning it has been very difficult for women to enter at the highest level. The progress in gender equality in politics has been uneven so far and significant differences exist among states and regions (Jakešević & Lusa, 2021, p. 33). Women's share of global lower or single-house parliamentary seats has increased by over 70% over the 21st century. Yet these increases have not been uniform across countries (Rosen, 2017, p. 82). In many of the most developed countries, including Slovakia is equality between women and men considered one of the basic rights, attributes of democracy, and display of social equity (Jánošková & Petrušová, 2019, p. 21). In a wider pan-European and global context, the degree of women's participation in power and decision-making is an indicator of civilizational maturity, a parameter of human development in the sense of women's ability to make individual decisions and participate in the benefits generated on a societal level as well (Holubová, 2010, p. 1). The participation of Slovak women in political decision-making after 1989 can be assessed as weak. This is evidenced by the insufficient fulfillment of the first assumption, which is the very presence of women in political bodies at the national, regional, and local levels. There is a significant gender gap (Bútorová, 2008, p. 280).

Before 1989, in the communist parliament of the Slovak Republic, women regularly made up 20 to 30% of all deputies. The reason was the existence of several quotas for filling parliamentary seats, among which there was also a quota for women, which required their 30 percent representation. Despite the relatively high number of women in legislative bodies, their participation in politics was only formal and their influence on decision-making was negligible. Right after the first free elections in 1990, the quota system was abolished as a discredited symbol of socialism, and the share of women in the parliament dropped from a third to 12%. The reason for such a result was, on the one hand, the low representation of women on the candidate lists of political parties, and, on the other hand, their disadvantaged position in the back seats, which gave them only a small chance of being elected. The Parliament of the Slovak Republic has 150 members - deputies.

From a gender perspective, the biggest success in history was the elections in 2010, when a woman stood at the head of the Slovak government for the first and only time so far. We must also not forget that in 2019 she became the fifth president of the Slovak Republic, Mgr. Zuzana

Čaputová. She is the first woman in the office of the President of the Slovak Republic and, at the age of 45 (at the time of the elections), she is also the youngest person to ever hold the office of the President of the Slovak Republic.

**Table 1.** Representation of women in the Parliament of the Slovak Republic

Election period	Number of women	Women in %
1994-1998	22	14.66
1998 -2002	16	10.66
2002 -2006	21	14.00
2006 -2010	26	17.33
2010 -2012	22	14.66
2012 - 2016	24	16.00
2016 -2022	28	18.66
2022 - 2026	32	21.33

Source: ŠÚ SR, n.d.; own processing

A proportional electoral system with an open list of candidates is typical for elections to the National Assembly of the Slovak Republic. This electoral method allows voters to exercise preferential voting, that is, to partially change the order of candidates and possibly also to decide on their advancement to parliament. In preferential voting, the rule is that the higher the candidates are placed, the higher the probability of their election. As can be seen from Table 1, the representation of women in the Parliament of the Slovak Republic has been in the range of 10-22% in the last thirty years. Currently, the Parliament of the Slovak Republic has the highest proportion of women, i.e. approximately one-fifth of the total number of deputies are women.

**Table 2.** Representation of women in the European Parliament 2004 - 2019

Elections	Number of seats for Slovakia	Number of elected women deputies	Share of elected female MPs in %
2004	14	5	35.7
2009	13	5	38.5
2014	13	4	30.8
2019	13	3	23.1

Source: ŠÚ SR, n.d.; own processing

We can also positively evaluate the representation of Slovak women - MPs in the European Parliament in the first two election periods. The first elections to the European Parliament were held in 2004 when Slovakia joined the European Union. In the first three elections, the participation of women in the European Parliament was the highest among all levels of political power in Slovakia, although it has had a downward trend in recent years. However, the change occurred in the most recent elections, when the share of women did not even reach the level of representation of women in local self-government.

### 3. WOMEN'S REPRESENTATION IN REGIONAL AND LOCAL BODIES SELF-GOVERNMENT

Elections to higher territorial units have been held six times so far, the first time in 2001. The regional level of self-government was absent in Slovakia until then. Elections are held to elect the chairman of the higher territorial unit and deputies to the 8 higher territorial units. In the first four electoral periods, in none of the regions was a woman elected to the post of chairperson. Thus, without exception, the leadership of the counties has been in the hands of men. The

change took place only in the 2017-2022 term and was reconfirmed in the next term when a single woman was elected to the post of chairperson of a local government region. In both periods this was the case in Žilina Region.

**Table 3.** Representation of women MPs (%)  
in the councils of self-governing regions of the Slovak Republic

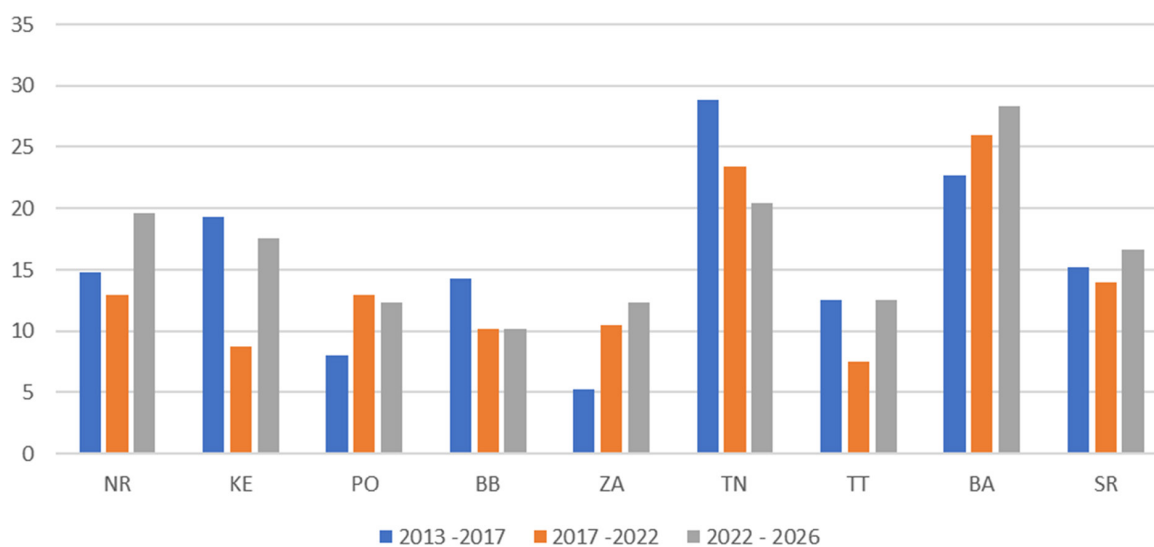
Election period	NR	KE	PO	BB	ZA	TN	TT	BA	SR
2013-2017	14.81	19.30	8.06	14.29	5.26	28.89	12.50	22.72	<b>15.19</b>
2017-2022	12.96	8.77	12.90	10.20	10.53	23.40	7.50	26.00	<b>13.94</b>
2022-2026	19.64	17.54	12.31	10.20	12.28	20.45	12.50	28.30	<b>16.62</b>

**Legend:** NR - Nitra region, KE - Košice region, PO - Prešov region, BB – Banská Bystrica region, ZA – Žilina region, TN – Trenčín region, TT – Trnava region, BA – Bratislava region, SR - Slovak Republic

**Source:** websites of self-governing regions, own processing

The average share of women among elected members of local government at the level of the LDCs is below 17%. Thus, the participation of women in the governance of the LDCs can be considered insufficient. Table 3 shows the results of the elections to the regional councils of the Slovak Republic in the last three elections. We see here significant regional disproportions. In the current period, the Banská Bystrica Region (10.20%), the Žilina Region (12.28%) and the Prešov Region (12.31%) have the lowest representation of women. The region with the highest number of female MPs is currently the Bratislava Self-Governing Region, with just under one-third of the total (28.30%).

From Table 3 we can see that in the long term only two self-governing regions, namely Bratislava and Trenčín, are above the 20% threshold for the representation of women in the MPs of the Regional Self-Government Bodies. In the former, the participation of women is gradually increasing, but in the latter, we have observed a decreasing tendency.



**Figure 1.** Representation of women MPs (%) in the councils of self-governing regions of the Slovak Republic

**Source:** own processing

In local elections, people elect councillors and mayors of municipalities, boroughs, and towns. The election of mayors uses a single-round relative majority system, i.e. the candidate with the

highest number of votes wins. Local politics should be the closest of all political areas to the citizens. This is where people should be able to participate most easily. Despite this, however, the representation of women at this political level is relatively low. So-called municipal politics is also seen as a career bridge for women politicians to the national political level.

**Table 4.** Results of elections for mayors of municipalities, towns, and city districts in 2014, 2018, 2022

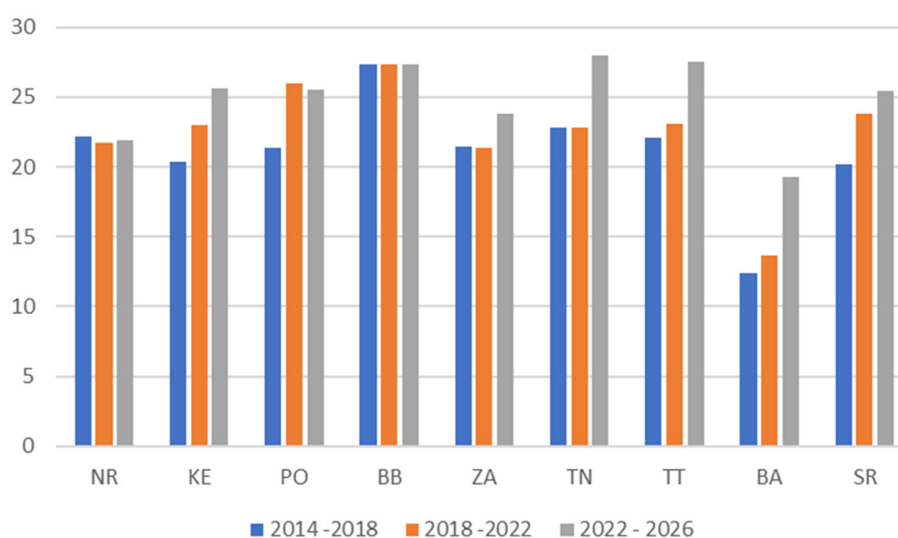
Election period	NR	KE	PO	BB	ZA	TN	TT	BA	SR
2014-2018	22.16	20.39	21.36	27.34	21.47	22.82	22.09	12.36	<b>20.20</b>
2018-2022	21.75	22.99	25.97	27.38	21.34	22.83	23.11	13.63	<b>23.81</b>
2022-2026	21.88	25.60	25.57	27.34	23.79	28.00	27.49	19.32	<b>25.46</b>

**Legend:** NR - Nitra region, KE - Košice region, PO - Prešov region, BB – Banská Bystrica region, ZA – Žilina region, TN – Trenčín region, TT – Trnava region, BA – Bratislava region, SR - Slovak Republic

**Source:** ŠÚ SR, n.d.; own processing

The number of women mayors of municipalities, towns, and urban districts after the first elections in the era of the independent Slovak Republic in 1994 was on average 15.2%. In the last elections in 2022, 25.46% of women were elected to these positions.

Table 4 shows the results of the elections for mayors of municipalities, towns, and urban districts in 2014, 2018 and 2022 from the perspective of individual regions of the Slovak Republic. In the long term, the lowest representation of women in these positions is in the Bratislava region, although we observe a gradual increase (12.36% - 2014, present 19.32%).



**Figure 2.** Representation of women as mayors of municipalities, towns, and districts in %.

**Source:** own processing

After the last elections, the highest representation of women at that level of local self-government is in the Trenčín Region, at 28%. Interestingly, in all regions (except Nitra) the share of women in mayoral positions is increasing. The Nitra region shows a gradual, albeit slight, but persistent decline.

At the local level, it is typical for women to be mayors of small villages, with their numbers decreasing as the size of the village increases. One of the reasons why there are more women in

local politics than at higher levels may be that the job of mayor does not require a change of residence and is more easily compatible with caring for a family. Since daily contact with the family is maintained at the local level, the conflict of family versus public activity is weaker than it is when working in national positions.

#### 4. CONCLUSION

Barriers to women's entry into political office can be seen in many factors in the socio-cultural setting of society, as well as in the practices of political parties and political culture. Some barriers are obvious, others more hidden and sophisticated, relating to the mechanisms and practices of the political culture created by the long-standing social dominance of men in this area.

Family responsibilities repeatedly emerge as the most intense and universal barrier to women's entry into politics. Women's entry requires the consent and support of spouses and family members. Meanwhile, the burden of paid and unpaid work on women increases disproportionately, especially at weekends. Politics is another activity for them, with family members taking on only part of the responsibilities. At the local level this is manageable, but by going to national functions the conflict between family and public activity becomes even more acute.

The equalisation of women's status in politics and the labour market is gradually occurring as women's educational attainment increases. Nowadays, women are more educated than at any time in the past. But despite this, their numbers in managerial positions, and especially in top positions, are still insufficient. Social attitudes, which are still dominated by the view that men are better suited to senior management roles, are a significant contributory factor to this situation. Research and various analyses of women's attitudes suggest that women themselves also contribute to these attitudes. Women do not seek to make themselves visible. Women who seek to advance in employment and also in social status must become more 'visible'. This is primarily a matter of acquiring and being thoroughly aware of information about their career paths, but also of socio-economic information and a new attitude towards their careers. A woman cannot wait for someone to organize her career, she must have her plan, goals and active control over her career, the ability to effectively communicate to others the results of her work, goals, ideas and understanding of her own development and growth potential during her working career.

#### References

- Banskobystrica self-governing region. (n.d.). <https://www.bbsk.sk/>
- Bratislavský samosprávny kraj. (n.d.). <https://bratislavskykraj.sk/>
- Bútorová, Z. a kol. (2008). *Ona a on na Slovensku: zaostrené na rod a vek*. (p. 368). Bratislava: Inštitút pre verejné otázky.
- Holubová, B. (2010). *Účasť žien v politike – postoje, stav a perspektíva*. Retrieved June 15, 2023 from <https://silo.tips/download/uas-ien-v-politike-postoje-stav-a-perspektiva>
- Jakšević, R., & Lusa, D. (2021). Breaking the glass ceiling: the role of the UN and the EU in promoting women in politics. *Politička misao*, 58(2), 33-63. <https://doi.org/10.20901/pm.58.2.02>
- Jánošková, B., & Petrušová, D. (2019). Gender equality in the management positions of university of Trenčín. *University review*. Vol. 13 (4), pp. 21-24.
- Košický samosprávny kraj. (n.d.). <https://web.vucke.sk/sk/>
- Národná rada Slovenskej republiky. (n.d.). <https://www.nrsr.sk/web/>



- Nitriansky samosprávny kraj. (n.d.). <https://www.unsk.sk/>
- Prešovský samosprávny kraj. (n.d.). <https://www.po-kraj.sk/sk/>
- Rosen, J. (2017). Gender quotas for women in national politics: A comparative analysis across development thresholds. *Social Science Research*, 66, 82-101. <https://doi.org/10.1016/j.ssresearch.2017.01.008>
- Statistical office of the Slovak Republic. (n.d.). <https://volby.statistics.sk/>
- ŠÚ SR. (n.d.). <https://slovak.statistics.sk/>
- Trenčiansky samosprávny kraj. (n.d.). <https://www.tsk.sk/>
- Trnavský samosprávny kraj. (n.d.). <https://trnava-vuc.sk/>
- Žilinský samosprávny kraj. (n.d.). <https://www.zilinskazupa.sk/>





# The Importance of R&D Projects in Serbia – The Role of Human Capital

Aleksandra Pavlović<sup>1</sup>   
Ivana Janjić<sup>2</sup> 

Received: August 28, 2023  
Accepted: February 26, 2024  
Published: March 16, 2024

## Keywords:

R&D projects investment;  
Human capital;  
Serbia;  
Multivariate linear regression



Creative Commons Non Commercial CC BY-NC: This article is distributed under the terms of the Creative Commons Attribution-Non-Commercial 4.0 License (<https://creativecommons.org/licenses/by-nc/4.0/>) which permits non-commercial use, reproduction and distribution of the work without further permission.

**Abstract:** *Research and development (R&D) projects are crucial for the implementation of a company's strategy and a prerequisite for achieving a competitive advantage. In globalized conditions, the success of R&D projects significantly depends on the capabilities of human capital. Human capital is the most valuable resource of any country, therefore, the cooperation of scientific-research organizations with companies from the private sector in the field of realization of R&D projects has become inevitable. The primary goal of this paper is to examine the relationship between R&D project investments and human capital (employees in the R&D area and highly-educated employees), from 2008 to 2021. For that purpose, multivariate linear regression has been applied. The results revealed that a highly educated workforce is of key importance for the growth of investments in R&D projects, hereby, the proposal for policymakers would be to encourage greater investments in higher education, as well as to strengthen better cooperation between science and business.*

## 1. INTRODUCTION

R&D projects are at the forefront of innovation, promoting the creation of new technologies, products and processes. R&D initiatives are commonly acknowledged as the main forces of innovation and technical advancement, which facilitate industry diversification and transformation. The effective implementation of R&D projects depends heavily on human capital. R&D initiatives often involve highly technical expertise in fields such as science, engineering, and technology. R&D projects are essentially inventive, knowledge-intensive efforts designed to develop new products, innovations, technologies, or methods. The abilities, knowledge, and inventiveness of the people engaged in undertaking R&D projects have a significant impact on the effectiveness of these projects. Human resources with excellent project management abilities can effectively assess resources, define goals, manage timeframe, and adjust to unforeseen challenges to keep the project on track.

The research paper is organized into a few parts. Firstly, after the introduction, the literature review, i.e. the relationship between R&D projects and human resources is given. The analysis of R&D projects and human capital in Serbia is also presented. The next section presents the data and methodology of the research, followed by the results of empirical analysis. The final section provides discussions of theoretical and empirical findings.

## 2. LITERATURE REVIEW

In the conditions of a sharp and intensive competitive environment, firms and countries are constantly under pressure to innovate (Parikh, 2001) and undertake R&D activities. R&D activities

<sup>1</sup> The Academy of Applied Technical Studies Belgrade, Katarine Ambrozić 3, 11000, Belgrade, Republic of Serbia

<sup>2</sup> Innovation center, University of Niš, University Square 2, 18000, Niš, Republic of Serbia

are often directed toward resolving particular, unstructured, and difficult issues (Drongelen et al., 2000), and they are frequently carried out in the form of projects. Nowadays, organizations implement R&D projects and activities to identify and solve challenges caused by rapid changes in customer requirements and the competitive environment of domestic and international markets (Bican & Brem, 2020). Understanding how firms and countries use their workforce to promote innovation and technological growth, requires an awareness of the link between R&D initiatives and human capital.

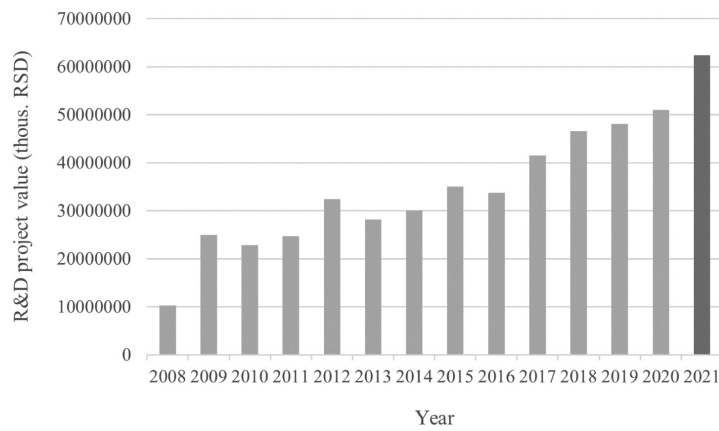
As endogenous growth models have evolved, economists have begun to place a greater emphasis on innovation performance as a fundamental driver of economic growth. At the macro and micro level, a factor considered an important determinant of R&D investment is human capital. Human capital has long been recognized as one of the key factors influencing an organization's capacity for innovation. In order to improve innovative performance and economic growth, human capital has become crucial. The ability of a company to innovate depends heavily on its human capital, which is considered the collective and individual expertise of its personnel (Mariz-Perez et al., 2012). For stimulating creativity, promoting collaboration, and successfully managing the complex processes involved with R&D operations, it is essential to have skilled, motivated, and well-managed human resources. Some researchers have concluded that people engaged in R&D activities have explanatory power for models of research outputs including patents and publications (Ayan et al., 2023).

In a sample of 1666 Spanish industrial firms, some researchers (Martínez-Sánchez et al., 2020, p. 431) examined how some human resources (HR) flexibility mediates the association between R&D efforts and the absorptive capacity of knowledge (AC). The findings indicate that temporary employment of human resources does not moderate the relationship between R&D efforts and AC, although core employee training and external R&D specialists do. Integrating temporary human resources into R&D projects and contributing to the AC is more challenging for firms with a large proportion of temporary employees (Martínez-Sánchez et al., 2020, p. 434). According to Un (2017), companies that engage more in internal R&D and have more trained and qualified employees are also likely to invest more in external R&D. Some authors (Honjo et al., 2014, p. 207) concluded that the success of R&D projects is anticipated for companies led by founders with greater levels of human capital. Wu and Sun (2006) have created a mixed non-linear program to minimize outsourcing expenses and to take into account the impact of staff learning on R&D multi-project scheduling and staffing issues.

### 3. ANALYSIS OF R&D PROJECTS AND HUMAN CAPITAL IN SERBIA

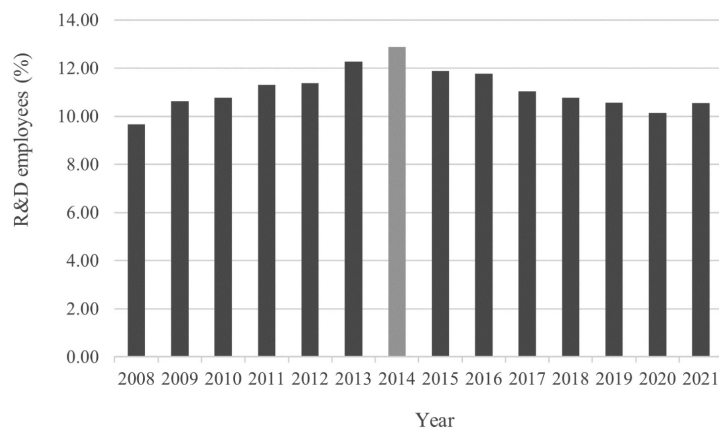
Serbia, located at the crossroads of Europe, is transitioning to a knowledge-driven economy. An essential pillar of this journey are R&D projects, which fuel the country's goals of greater competitiveness, industry diversification, sustainable growth, and human capital, pivotal in shaping the success of R&D endeavors. Serbia's dedication to encouraging innovation and using its intellectual resources is taking shape through an increasing focus on R&D efforts, against the backdrop of changing global dynamics.

Based on the data shown in Figure 1, it can be concluded that the value of R&D projects in Serbia has been steadily increasing during the analyzed period. Observing the data from 2008 to 2021, there were a few minor decreases in the value of R&D projects, recorded in 2008, 2010, 2013 and 2016. The highest value of RSD 62,330,472 was achieved in 2021.



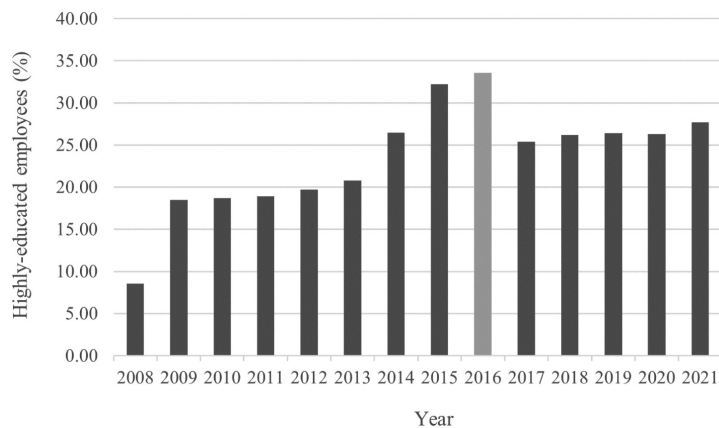
**Figure 1.** The value of R&D project per year

**Source:** Statistički godišnjak – Republički Statistički Zavod (2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022)



**Figure 2.** R&D employees (%)

**Source:** Statistički godišnjak – Republički Statistički Zavod (2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022)



**Figure 3.** The share of highly-educated employees in total R&D employment

**Source:** Statistički godišnjak – Republički Statistički Zavod (2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022)

R&D personnel refer to all individuals who are directly involved in R&D and who provide direct support for implementing those activities, such as R&D managers, researchers, technicians, administrators and support staff (Ayan et al., 2023). The data in Figure 2 primarily lead to the

conclusion that the number of R&D employees has been steadily declining in 2010, 2011 and 2012, probably due to the brain drain and ageing of the research population. The highest value was achieved in 2014, and after that, a gradual decline of this value was recorded, while in 2021 a significant increase was recorded again.

Implementing R&D and innovation activities, as well as accelerating technological progress requires the skills, competencies and knowledge of highly-educated employees. Observing the data shown in Figure 3 it can be stated that the share of highly-educated employees in total R&D employment from 2008 to 2016 had a rising trend. According to the data given in Figure 3, the share of highly-educated employees in total R&D employment began to have a downward trend from 2017 until 2020, before a slight increase in 2021.

#### 4. DATA AND METHODOLOGY

This paper aims to explore the relationship between R&D project investments and human capital. The research is based on the data of the following indicators: The share of R&D employees in total employment, The share of highly-educated employees in total employment, the Knowledge-intensive sector's Gross Value Added and the Value of R&D projects.

In the research of this paper, secondary data was obtained from the official website of The Statistical Office of the Republic of Serbia, by studying the Statistical Yearbooks to calculate research variables and conduct analysis. The analysed period covers the data from 2008 to 2021. In the model of the research,  $\lnRD\_Emp$  (the share of R&D employees in total employment),  $\lnHE\_Emp$  (the share of highly-educated employees in total R&D employment),  $\lnKIS\_GVA$  (knowledge-intensive sectors Gross Value Added) are independent variables, while  $\lnRDP\_Inv$  (the value of R&D projects) is the dependent variable. Statistical data processing was done with IBM SPSS Statistics 25 software. Firstly, in order to achieve linearity, all raw data was transferred in natural logarithm values. Secondly, in the research model, multivariate linear regression was performed, to evaluate the impact of the independent variables ( $\lnRD\_Emp$ ,  $\lnHE\_Emp$ ,  $\lnKIS\_GVA$ ) on the dependent variable ( $\lnRDP\_Inv$ ).

**Table 1.** Definition of variables, type, unit and data source

Variable	Definition	Unit	Type	Source
$\lnRDP\_Inv$	The value of R&D projects	Thous. RSD	Dependent	SYRS
$\lnRD\_Emp$	The share of R&D personnel in total employment	%	independent	SYRS
$\lnHE\_Emp$	The share of highly-educated employees in total employment	%	independent	SYRS
$\lnKIS\_GVA$	Knowledge-intensive sectors' Gross Value Added, as a share of GDP	%	independent	SYRS

Source: Own calculations

Therefore, the research was conducted according to the following model:

$$\ln RDP_{Inv_t} = \beta_0 + \beta_1 \ln RD_{Emp_t} + \beta_2 \ln HE_{Emp_t} + \beta_3 \ln KIS_{GVA_t} + \varepsilon_t \quad (1)$$

#### 5. RESULTS

Descriptive statistical analysis was performed to present the minimum, maximum, mean, and standard deviation values of researched variables. The descriptive statistics of the variables analysed in this paper are shown in Table 2. The data on the value of R&D projects implies that

the variable's mean value is 17.2511 (SD = 0.46500). The share of R&D employees in total employment varies between 2.27 and 2.56 with a mean value of 2.480 (SD = 0.07728). The share of highly-educated employees in total employment ranges from 2.14 to 3.51 (SD = 0.34118). Lastly, the average value of knowledge-intensive sectors gross value added is 3.4347 (SD = 0.12753).

**Table 2.** Descriptive statistics

Descriptive statistics	lnRDP_Inv	lnRD_Emp	lnHE_Emp	lnKIS_GVA
Mean	17.2511	2.4080	3.1122	3.4347
Std.	0.46500	0.07728	0.34118	0.12753
Min	16.14	2.27	2.14	3.14
Max	17.95	2.56	3.51	3.60
Observations (N)	12	12	14	14
Valid N (listwise)	12			

**Source:** Own calculations

Table 3 reflects descriptive statistics from the regression output. Based on the coefficient of determination ( $R^2 = 0.897$ ), which is a measure of “explained variation”, about 90% of the total variation in RDP\_Inv is explained by the regression. The standard error of estimate as a measure of “unexplained variation” is 0.17515.

**Table 3.** Descriptive statistics from the regression output

R	0.947
R <sup>2</sup>	0.897
Adjusted R <sup>2</sup>	0.858
Standard error	0.17515
Observations	12

**Source:** Own calculations

In Table 4, the F-test was used to determine the validity of the entire regression model (1) and the presence of regression dependence. The results of the F-test ( $F = 23.176$ ) point out that the regression is statistically significant at the significance level  $\alpha = 0.05$  because the p-value is less than 0.05 (0.000). As a result, the validity of the regression model is confirmed, and the null hypothesis can be rejected because there is a regression dependence between the observed variables.

**Table 4.** F-test

Model	F	Significance
Regression	23.176	0.000

**Source:** Own calculations

To examine the individual effectiveness of the independent variables in predicting the dependent variable, a t-test was conducted (Table 5). Additionally, t-tests are used to compare the significance of different model variables, which might help to determine which factors are most crucial for forecasting the dependent variable.

**Table 5.** Regression coefficients and t-test

Model	B	t	Significance
Constant	16.069	6.421	0.000
lnHE_Emp	1.666	6.242	0.000
lnKIS_GVA	0.583	1.028	0.334
lnRD_Emp	-2.463	-2.836	0.022

**Source:** Own calculations

Based on the results shown in Table 5, it can be concluded that it is not possible to reject the null hypothesis for the variable  $\ln KIS\_GVA$ , due that the p-value is  $0.334 > 0.05$ . This indicates that this variable should be excluded from the regression model since it is not statistically significant, i.e. not useful for predicting the dependent variable  $\ln RDP\_Inv$ . For the variables  $\ln HE\_Emp$  and  $\ln RD\_Emp$ , the null hypothesis can be rejected because the p-values are  $0.000 < 0.05$  and  $0.022 < 0.05$ , thus, these variables can be useful for predicting the dependent variable  $\ln RDP\_Inv$ . The model predicts that with an increase in the number of employees who have higher education by 1%, there will be an increase in investments in R&D projects by RSD 1,666, as well as with an increase in the number of employees in the field of R&D by 1%, there will be a decrease in investments in R&D projects for 2463 RSD, provided that all other variables in the model are constant.

## 6. CONCLUSION

In the contemporary global landscape, R&D projects have become important engines of innovation, economic expansion and societal progress in the modern world. The essential role of people involved in R&D activities, i.e. human capital and their knowledge, skills, expertise and capabilities are at the core of these revolutionary endeavors. Serbia is one of the Western Balkans' top R&D investors, yet it ranks behind the majority of EU members. Spending levels are relatively modest, have not expanded steadily, and are heavily concentrated in the public sector, which is governed by the Ministry of Education and Science. While the country has been utilizing foreign (particularly EU) resources, private sector investment in R&D has been limited (World Bank, 2013, p. 12).

The research conducted in this paper has confirmed that there is a strong positive connection between higher education and R&D projects, i.e. the increase in the highly-educated workforce in Serbia leads to an increase in R&D project investments. However, it was revealed that there is a negative association between the observed variables, i.e. the increase in the number of employees in the R&D sector leads to a decrease in R&D projects investments. This could lead to the conclusion that there is not a sufficient number of highly-educated employees in the R&D sector in Serbia. There are certainly employees, which is good, and the R&D sector in Serbia is slowly developing and growing. However, it is necessary to stimulate the employment of highly-educated young people in the mentioned sector. Thus, Serbia has a large number of experts from various scientific fields, researchers and PhDs, and many of them are still waiting for a job, or are not paid enough for their work. Given that, the R&D sector is an excellent opportunity for such experts.

Unfortunately, there is a lack of research from this important area in Serbia – the area of R&D investments and higher education, therefore, the recommendation to future researchers in this area from Serbia and the region would be to deal with this issue in the future.

### Acknowledgment

This research was financially supported by the Ministry of Science and Technological Development and Innovation of the Republic of Serbia (Contract No. 451-03-47/2023-01/200371).



## References

- Ayan, D. E., Haak, L. L., & Ginther, D. K. (2023). How many people in the world do research and development. *Global Policy*, 14(2), 270-287. <https://doi.org/10.1111/1758-5899.13182>
- Bican, P. M., & Brem, A. (2020). Managing innovation performance: Results from an industry-spanning explorative study on R&D key measures. *Creativity and Innovation Management*, 29(2), 268–291. <https://doi.org/10.1111/caim.12370>
- Drongelen, I. K. V., Nixon, B., & Pearson, A. (2000). Performance measurement in industrial R&D. *International Journal of Management Review*, 2(2), 111–143. <https://doi.org/10.1111/1468-2370.00034>
- Honjo, Y., Kato, M., & Okamuro, H. (2014). R&D investment of start-up firms: does founders human capital matter?. *Small Business Economics*, 42, 207-222. <https://doi.org/10.1007/s11187-013-9476-x>
- Mariz-Perez, R. M., Teijeiro-Alvarez, M. M., & Garcia-Alvarez, M. T. (2012). The relevance of human capital as a driver for innovation. *Cuadernos de Economía*, 35(98), 68-76. [https://doi.org/10.1016/s0210-0266\(12\)70024-9](https://doi.org/10.1016/s0210-0266(12)70024-9)
- Martínez-Sánchez, A., Vicente-Olivia, S., & Manuela Pérez-Pérez, M. (2020). The relationship between R&D, the absorptive capacity of knowledge, human resource flexibility and innovation: Mediator effects on industrial firms. *Journal of Business Research*, 118, 431-440. <https://doi.org/10.1016/j.jbusres.2020.07.014>
- Parikh, M. (2001). Knowledge Management Framework for High-Tech Research and Development. *Engineering Management Journal*, 13(3), 27-34. <https://doi.org/10.1080/10429247.2001.11415124>
- Republički Statistički Zavod. (2009). *Statistički godišnjak, Beograd*: Republički Statistički Zavod.
- Republički Statistički Zavod. (2010). *Statistički godišnjak, Beograd*: Republički Statistički Zavod.
- Republički Statistički Zavod. (2011). *Statistički godišnjak, Beograd*: Republički Statistički Zavod.
- Republički Statistički Zavod. (2012). *Statistički godišnjak, Beograd*: Republički Statistički Zavod.
- Republički Statistički Zavod. (2013). *Statistički godišnjak, Beograd*: Republički Statistički Zavod.
- Republički Statistički Zavod. (2014). *Statistički godišnjak, Beograd*: Republički Statistički Zavod.
- Republički Statistički Zavod. (2015). *Statistički godišnjak, Beograd*: Republički Statistički Zavod.
- Republički Statistički Zavod. (2016). *Statistički godišnjak, Beograd*: Republički Statistički Zavod.
- Republički Statistički Zavod. (2017). *Statistički godišnjak, Beograd*: Republički Statistički Zavod.
- Republički Statistički Zavod. (2018). *Statistički godišnjak, Beograd*: Republički Statistički Zavod.
- Republički Statistički Zavod. (2019). *Statistički godišnjak, Beograd*: Republički Statistički Zavod.
- Republički Statistički Zavod. (2020). *Statistički godišnjak, Beograd*: Republički Statistički Zavod.
- Republički Statistički Zavod. (2021). *Statistički godišnjak, Beograd*: Republički Statistički Zavod.
- Republički Statistički Zavod. (2022). *Statistički godišnjak, Beograd*: Republički Statistički Zavod.
- Un, C. A. (2017). Absorptive capacity and R&D outsourcing. *Journal of Engineering and Technology Management*, 43, 34-47. <https://doi.org/10.1016/j.jengtecman.2017.01.001>
- World Bank. (2013). *Western Balkans Regional R&D Strategy for Innovation*. Country paper series – Serbia, Regional Cooperation Council, Retrieved on: <https://www.worldbank.org/content/dam/Worldbank/document/eca/Western-Balkans-R%26D-Strategy-Innovation.pdf>
- Wu, M. C., & Sun, S. H. (2006). A project scheduling and staff assignment model considering learning effect. *International Journal of Advanced Manufacturing Technology*, 28, 1190–1195. DOI: [10.1007/s00170-004-2465-0](https://doi.org/10.1007/s00170-004-2465-0)





# Human Strivings, between Social Change and Lifelong Learning

Mirela Cristiana Nilă Stratone<sup>1</sup> 

Received: August 22, 2023

Accepted: November 21, 2023

Published: March 16, 2024

## Keywords:

Human strivings;  
Social change;  
Lifelong learning;  
Pedagogy of the self



Creative Commons Non Commercial CC BY-NC: This article is distributed under the terms of the Creative Commons Attribution-NonCommercial 4.0 License (<https://creativecommons.org/licenses/by-nc/4.0/>) which permits non-commercial use, reproduction and distribution of the work without further permission.

**Abstract:** *This paper explains the relationship between social change and lifelong learning, based on human efforts. The connecting element turns out to be the permanent process of transformation, both in terms of social change and education focused on lifelong learning. It is obvious that lifelong learning has become largely dependent on digitization, and the dominant method of this is becoming more and more pronounced as a new form of pedagogy of the self. This aspect leads to the new identity of the pedagogue/teacher, who, being also a dynamic element in the process of social change, transforms himself and at the same time the subject of learning. In this study, it is explained the need for a common vision about the interdependence between continuous and permanent social change on the one hand and the social need or the citizen's right of the adult to train throughout life, on the other hand.*

## 1. INTRODUCTION

Our civilizations are strongly related to the process of adult learning, as well as to the set of related attempts to form and organize creative motivational opportunities for adults to continue learning throughout their lives. They are connected to a set of stakeholders in various contexts, each with specific perspectives and goals, and consequently with a wide variety of opportunities for many reasons.

These organized adult learning opportunities have the potential to function as a powerful communication channel concerning the challenges of social change if approached from a systemic perspective and led by a skilled team. These strivings must aim to achieve the proposed objectives and target both the aspects related to inclusion and those related to quality, on the one hand, but also the definition and continuous redefinition regarding their purpose, functioning, and effectiveness, on the other hand. They also make it possible to deal with persistent communication distortions caused by unequal social power and resource distribution.

Change is a defining feature of social life. For this reason, efforts to coordinate and organize the adult learning process are fully justified.

Social change is a permanence of social life. The effects of social change trigger the manifestation of the material and mental strivings of the human being. Adult learning includes a gap between a person's already existing knowledge, acquired skills, and self-awareness and the needs that arise according to the effects of social change, which he inevitably faces, according to Osborne and Sim (2022).

Because the individual's needs change over time, he will constantly make efforts to find a solution. An important basis will refer to the accumulation of individual capabilities, which will constitute personal experience. Personal experience is the foundation on which the individual builds values throughout life.

<sup>1</sup> Faculty of International Relations and Administration, "Nicolae Titulescu" University, Văcărești Road, 185, zip code 040051, District 4, Bucharest, Romania

## 2. LIFELONG LEARNING

A learning strategy known as lifelong learning acknowledges the fact that education doesn't end with formal education or training for a particular job. It assumes lifelong learning that is driven by the desire for both personal growth and societal adaptation.

Lifelong learning allows both the continuous development of skills and competencies, as well as the necessary adaptation to the characteristic requirements of the labor market, which are constantly changing. This process equally includes formal learning within educational institutions, as well as informal learning based on daily experience and social interaction with other individuals, in the work of [Johnson and Majewska \(2022\)](#).

*New education* emerges as a realistic answer to the need for lifelong learning and the issues of the modern world. They stand for a cutting-edge educational strategy that attempts to transform the learning process and modify it to meet the requirements of a world that is always changing.

The focus of modern education is on helping students acquire vital life skills that are tailored to the requirements of a world that is continuously changing. Education in the areas of ecology, human rights, peace, democracy, demography, change and development, communication and mass media, nutrition, leisure activities, and others are among them. New forms that emphasize integrated activity and the practical aspect of learning are available in addition to these:

- education in the areas of science, technology, engineering, and mathematics represents an approach to the integrated learning of these fields, intending to develop skills related to analysis, solution, and collaboration;
- digital education, to integrate new technologies into the activity of the learning process, as well as the development of digital skills;
- competence-based education – aims to develop critical thinking, creativity, communication, cooperation, etc;
- experiential education - emphasizes learning through experience, applying knowledge and skills in daily practice, to develop practical skills and adapt to challenges;
- project-based education - a form of learning focused on project-based training, which has the merit of practically and creatively involving the people in training, in collaborative action, according to [Fitzgerald et al. \(2021\)](#).

To exist in a global network implies a strong connection to reality and implicitly permanent adaptation to social life. This requires skills of the human individual on three levels: cognitive, intrapersonal, and interpersonal, according to [Olcott \(2022\)](#). On this basis, a multitude of vital knowledge and skills, characteristic of the 21<sup>st</sup> century, grouped according to these three dimensions, come into the discussion. In the aforementioned work, knowledge and skills have been given names such as: "21<sup>st</sup>-century skills," "college and career readiness," "deeper learning," and "higher-order thinking." These categories contain some specific differences. However, they were addressed together as 21<sup>st</sup>-century skills, according to [NRC \(2012\)](#).

Each skill among the named skills of the 21<sup>st</sup> century belongs to one of the following three categories:

- *Learning skills* (the four C's - critical thinking, creativity, collaboration, communication) involve the mental processes with a role in the permanent adaptation to newly emerging social needs and the improvement of the organizational climate.

- *Literacy skills* (IMT- information, media, technology) require a high degree of concentration regarding the student's ability to distinguish and use, on consciously selected sources, the valuable/true information from the false, which must be avoided.
- *Life skills* (FLIPS- flexibility, leadership, initiative, productivity, social skills) - presuppose careful protection regarding both the student's personal qualities and his professional ones, considered intangible elements throughout the daily activity, according to Geisinger (2016).

We specify here that about the three levels, in specialized works, it was established that it contains:

- cognitive dimension - information literacy, knowledge, cognitive processes and strategies, critical thinking, creativity, reasoning, and innovation;
- intrapersonal dimension - work ethic and conscientiousness, positive core self-evaluation, intellectual openness, appreciation of diversity, flexibility, metacognition, initiative;
- interpersonal dimension - teamwork and collaboration, communication, leadership, conflict resolution, responsibility.

The ability of the human being to adapt and respond to continuous and unpredictable changes in personal plan, family, workplace, and society throughout the period in which he is integrated into the work process, so in parallel with his professional life, is due to educators. Why? Because educators are the shapers of the human being, throughout this process of knowledge and adaptation. All this action is carried out through learning, under the coordination of educators, based on which those subjected to learning develop and apply the skills of the 21<sup>st</sup> century, as previously mentioned in each area of competence.

This action takes place throughout the individual's active life because it is necessary for him to develop and apply the acquired knowledge and skills, which can adapt to new situations. However, teaching how to transfer skills, and how to extend a skill acquired in one context to a new situation, has proven to be a difficult operation in most cases. This transfer is dependent on the degree of understanding of the knowledge acquired through assimilation and analysis, which leads to a certain degree of depth, according to Dede et al. (2019).

All these strivings will be applied against the background of practice in the field, because there are high chances that new elements will appear, determined by factors that the individual does not always expect, no matter how much knowledge and capabilities he has accumulated. Only an internship can provide the benchmark of the sufficiency or insufficiency of the efforts made up to that point, as well as the need to persist in learning and adapting, an aspect encountered with great probability.

### **3. THE CHALLENGE OF SOCIAL CHANGE AND THE NEED FOR CONTINUOUS LEARNING**

For adults, as for children, education is a special force that leads to transformation. But it must be stated that in adults, unlike children, this force acts with a much greater power, adults being aware that in addition to society's expectations, the passage of time also acts. That is why the actions of adults are accelerated because they intend to have the necessary physical time to materialize what they learn throughout their lives.

The permanent and continuous form of lifelong learning has recently come to be considered a separate category of pedagogy, namely a "pedagogy of the self". Its purpose is to construct the

identity of a "trainer" with a role in reducing/stopping the welfare of the human individual in society. The first question concerns how this intention arose. Then there is the need to find out how educators can trigger the emergence of a pedagogy of lifelong learning in human individuals to guide them to well-being. Both issues expressed here constitute educational challenges.

Adults learn the most from their own experience, they make economic and social analyses, based on which they often make material and intellectual efforts both to improve themselves in the field in which they have trained, and to change their professional profile in which they were trained, if they consider it is necessary.

Last but not least, we meet adults at the college level who are completing their studies, in the field in which they worked from their youth to adulthood. This happens because in certain jobs, during their youth, in-depth specialized or college studies were not required.

This batch of study must be analyzed from the perspective of the fact that individuals are almost forced to attend university courses, otherwise, they are in a situation of losing their jobs, some of them being very close to retirement.

So, we are talking about elderly people, over 55 years old. These people very interestingly combine personal experience with new information, but online learning methods, because they, being already in the field of work, had to use digital technology, based on individual learning. Here we refer to the process of pedagogy of the self.

#### 4. TRAJECTORY AND CHARACTERISTICS OF SOCIAL CHANGE

According to the above information, it is necessary to establish a direction of approach regarding the trajectory and characteristics of social change. Looking for this trajectory of how we can relate to the image of social change, it can be concluded that a good way to describe social change is to organize social indicators into categories, as follows:

- **The population** rate change appears to us as a potential and common indicator, because it is observable how significant changes in the population - especially the reduction in its number - are an expression of social change. An aspect worth discussing refers to the fact that in the US, since 1950, there has been an increase in the Asian, Hispanic, etc. population. The change in the ethnic composition during the last decades has produced gradual changes, which will produce various effects in individual communities, under the conditions that they will become a "white minority".

An increase in the age of marriage was found, which leads to the appearance of the firstborn more and more later. One of the reasons is represented by the need of the human individual to specialize in a field, thus going through all the educational stages (bachelor's degree, master's degree, doctorate), according to [Anderson \(2014\)](#).

At the same time, there is also the need for an environment, which refers to the house with its corresponding equipment, as well as the satisfaction of the need to travel for profit or recreation, and this usually requires the purchase of a mobile. All these and many others require a time in which the human individual produces money through his work, to satisfy all these needs.

The time required to gather all these material goods represents a period that the human individual usually goes through before starting a family, before giving birth to the firstborn. This delay is a positive element in the life of the human individual regarding the material aspect of everyday life, to his professional training, but at the same time, it is also a negative element, because it favors the growth of differences between generations. As a parent, the older he is, the more difficult it will be for him to understand the values that his child cultivates, and just as difficult for him to pass on the educational values of his own family life.

Attempts to ensure comfort frequently lead to delaying the wedding. This results in a concubinage relationship. According to earlier studies, single persons could have less access to social support and personal networks. However, little is known about how older persons' marital status affects the quantity and quality of their social connections. Our findings indicate that marital status has a major impact on social ties, as he thinks [Zhang et al. \(2023\)](#).

- **The health** shows changes regarding the mortality rate and life expectancy, these being higher in the first half of the 20<sup>th</sup> century than in the second half. Stress-inducing events are usually associated with an enhanced subjective experience of change. The improvement of the state of public health can be primarily due to the measures applied in the first decades of the 20<sup>th</sup> century. Here we are talking about actions regarding public education, drinking water treatment, organized waste disposal, food safety, etc., as considered by [Schöley et al. \(2022\)](#).

- **The religion.** Overall, though, the century-long history of religion in the world has been more about consistency than change, as it shows [Montgomery \(1991\)](#). Currently, the acceptance of a single, global religion is desired at the planetary level.

According to studies, civilizational populism can be considered an expression of the general will of people. Society would exist as an effect of the coexistence of antagonistic groups: the group of pure people in opposition to the group represented by the corrupt elite. The most important thing is that the idea of civilization remains the core based on civilizational terms ([Yilmaz & Morieson, 2023](#)).

[Gareth \(2022\)](#) reports that the polarization of countries, determined by political choices based on race and ethnicity, leads to a complex and extensive problem. At the same time, on a global scale, religious conflicts are increasing, this being a phenomenon that arises, among others, against the backdrop of electoral contradictions. It is interesting to research how religious intolerance manifests itself before or after political elections.

- **Home, education, and leisure.** As expected, an improvement in social change would occur when both marriage and divorce are on the rise. In reality, there are fewer marriages, as a result of more unofficial relationships and their later formalization, hence resulting in fewer divorces.

Education levels have increased steadily throughout the 20<sup>th</sup> century and the beginning of the 21<sup>st</sup> century. In particular, it is noteworthy that the gender balance of graduates is marked by the increased percentage of bachelor's degrees awarded to women. It was intended to determine the perspectives of the stakeholders (teachers, students) about the provision of educational units with IT equipment, platforms, and specialized software developed to support the educational process based on qualitative research, according to [Rose \(2023\)](#).

The findings demonstrated that, for the most part, the educational institutions covered by the study to which we are referring have the required amenities. Modern amenities are available at the investigated educational institutions in urban settings, particularly in large cities.

In a rural setting, the situation is very different because many educational facilities lack the essential fundamental utilities, an Internet connection, and suitable areas. Regarding digital technology, we may state that this is challenging and desirable to realize.

The lack of training for the operation of various IT equipment was mentioned as one of the drawbacks by the respondents who took part in the qualitative research that forms the basis of this work. Additionally, they noted that there are instances in which, despite the availability of such technology, its proper use is impeded by the subjects' lack of training.

Due to inadequate budgets, schools are unable to hire technical staff to handle teacher training, equipment maintenance, etc.; as a result, it is hard to develop a workable system that addresses the use of new technologies.

Another finding from the field research is that no school units have been located where the educational process is entirely supported by computer-assisted instruction, as this approach depends on both the availability of hardware and software resources and a structured environment for its application, as it looks [Twenge et al. \(2015\)](#).

Leisure activities are constantly changing and influenced by fashion, but they are not much different from previous periods.

- **The work.** Among other things, social inclusion is based on the positive impact of labor and a person's employment in daily life. The interaction between coworkers at work reflects the mentalities brought about by age differences and the educational approach, which ranges from traditional to eLearning. This social theory claims that the generational conflict we are currently experiencing is a result of the competition between the young and the old for resources and employment. The labor market is by far the arena where professional competition takes place. It is a dynamic component that contributes to economic balance but may also create imbalances that might trigger crises, as suggested by [Grimm et al. \(2023\)](#).

- **The law.** The causes of incarceration rate fluctuations are complex, as is how they relate to social development, but the current statistics indicate that the past several decades have not been particularly unusual and may perhaps have been relatively peaceful compared to earlier times.

Although growth in recent decades has been modest, state and local government employment continued to rise throughout the 20<sup>th</sup> century. The current period does not appear to be particularly unique.

- **The wealth.** Another helpful indication of societal development is the distribution of wealth and income disparity data. In general, the public is opposed to the idea of government involvement to lessen economic inequality, according to [Kavanagh et al. \(2021\)](#).

- **Globalization.** Uncertainty surrounds the economic, social, and environmental effects of globalization, which is without a doubt a contentious issue. It is important to remember that the



concept of sustainable development aims to clarify how human activity can successfully support itself without diminishing the resources on which it depends.

Although a lot of academics concur that the idea of sustainability includes ongoing consumption, there are divergent opinions on how to do so without jeopardizing the requirements of future generations.

Additionally, the hegemonic school of thought saw globalization as the birth of a new world order that, through multinational corporations (MNCs) and international financial organizations like the World Bank (WB) and the International Monetary Fund, perpetuates injustice in developing nations. The sole goal of these organizations (the WB and IMF) is to promote capitalism accumulation in a setting with unrestricted market forces and a very circumscribed state apparatus.

Therefore, an unequal connection permits environmental costs and pollution to be transferred to developing countries, resulting in domestic environmental damages, the extinction of human and ecological populations, and a disproportionate allocation of trade advantages to the already privileged, as explained in [Murshed et al. \(2022\)](#).

**- *Social lifelong learning under new dimensions of knowledge.*** Considering the social changes, we want to achieve, we must pay special attention to social learning. Social learning is a specific form of informal education. This is characterized, among other things, by the fact that it is usually experiential and supported by decentralized groups. People bring personal ideas and experiences to the learning process, and from this, we can deduce disorganization, diversity, and personalization from one individual to another.

At the same time as the need to modernize learning, there is a certain evolution of the procedures through which knowledge is approached. That's why it was necessary to reorient ourselves, from "concentration" to "distribution". Knowledge is now dispersed, diffused, and free, but it should be mentioned that there are also some disadvantages, which fall under the following framework: if in the past we stored information in books, libraries, and specialized learning centers, today this information is dispersed and free, in the sense that it does not prove validity. However, the formality of the information, the rigor, and the verification of their validity remains a constant need in human efforts, in lifelong learning according to [Walcutt and Schatz \(2019\)](#).

Starting from the idea that the information disseminated on a large scale and moderated by the community is not constantly accurate, it is necessary to remember that the information before this stage of the current social change was not completely accurate either. We are still working on the methods of validating previously acquired social knowledge, in the effort made by researchers to reach an increased degree of knowledge validity.

So, the image of human society is not presented as a conclusion on it, a finality. There are still misinterpretations, a kind of tribute to stereotypes, which act in the long term and of course leave their mark on social life. It is important to surprise the changes that take place both at the level of collective consciousness and at the behavioral level.

Of all the forms of manifestation of change in social life, technology is the most pronounced, which lays the foundation for the diversification of forms of communication, which determine social collaboration. Technology is the essential element based on which connections are formed in virtual organizations, [Morrison-Smith and Ruiz \(2020\)](#).

Because learning is a ubiquitous process, it should be mentioned that lifelong learning includes all phases of learning that take place at all stages of life. This instructive-educational process takes place in different social contexts: at school, at work, at home, in the community, and in special situations, such as specialized institutions, in the work of [Laal \(2011\)](#). Lifelong learning can take place both formally and institutionally in educational institutions such as schools, and universities, as well as non-formal, outside institutions, such as meeting workshops. Last but not least, lifelong learning takes place in an informal, non-institutional setting, and here we are talking about the family group, the group of friends, the group of colleagues, or the information on social media, according to [Kalz \(2015\)](#).

## 5. FUTURE RESEARCH DIRECTIONS

Future research directions, therefore, require an approach based on the trajectory offered by the categories presented above. This is how social change can be followed, with the respective categories representing the markers of social change. These markers are the ones that can give us an overall picture of social change. On this basis, the trajectory of human strivings in the need to adapt to new social needs can be configured.

## 6. CONCLUSION

First of all, it should be mentioned that the elements and factors addressed in this material are the subject of a wide range of issues in the sense that they involve complex and difficult epistemological and methodological aspects. The causes of particularly accentuated social change involve socio-psychological phenomena on the one hand and the material side of social and individual life on the other.

Secondly, it should be mentioned that social change is a characteristic of every generation of human beings.

At the same time, continuity and change are normal factors in the framework of history. This is demonstrated by every sociological analysis and not only, in any temporal segment of the historical evolution of humanity.

The absence of change would be impossible. The information collected and mentioned in this article leads to the conclusion that we are enduring a paradigm shift in human society. Online technology, and digitization in most fields of activity, clearly lead to the need for learning throughout the individual's life.

Thirdly, we must take technological changes into account in our analysis, and point out that they offer us consistent support in the practical application of the accumulated knowledge. Lifelong learning is the process by which adults accumulate the necessary information to face the needs triggered by the change in society, using this knowledge in everyday practice.

Digital technology raises serious methodological problems, which is why adults cannot limit themselves to what they learn during school.

Adults have understood the need for continuous learning, approach, and knowledge of new digital technologies, all to be able to adapt to social change and its ever-new demands.

It results in a lot of qualitative data available for future analysis, while social change indicators can provide new models of social constructs. Last but not least, we must mention the importance of the social relationships that arise from these changes at the socio-technological level, relationships that can lead to new theoretical approaches to human society.

## References

- Anderson, J. (2014). The Impact of Family Structure on the Health of Children: Effects of Divorce. *The Linacre Quarterly*, 81(4):378-387. <https://doi.org/10.1179/0024363914Z.00000000087>
- Dede, C., Richards, J., & Saxberg, B. (2019). Learning Engineering for Online Education: Theoretical Contexts and Design-Based Examples. *Journal of Applied Learning & Teaching*. <https://doi.org/10.37074/jalt.2019.2.2.17>
- Fitzgerald, S. L., Popa, C., Fitzgerald, C., & Vesa, A. (2021). Interdisciplinary Learning for Pre-service Teachers. *Revista Romaneasca pentru Educatie Multidimensionala*, 13(1Sup1), 101-122. <https://doi.org/10.18662/rrem/13.1Sup1/387>
- Gareth, N. (2022). Election cycles and global religious intolerance. *PNAS*, 120 (1) e2213198120. <https://doi.org/10.1073/pnas.2213198120>
- Geisinger, K. F. (2016). 21st Century Skills: What Are They and How Do We Assess Them? *Applied Measurement in Education*, 29(4), 245-249. <https://doi.org/10.1080/08957347.2016.1209207>
- Grimm, N., Hense, A., & Vogel, B. (2023). How Employment Generates Social Integration: Trends Towards Disintegration and Over-Integration in the Hyper-Work Society. *Köln Z Soziol.* <https://doi.org/10.1007/s11577-023-00903-5>
- Johnson, M., & Majewska, D. (2022). *Formal, non-formal, and informal learning: What are they, and how can we research them?* Cambridge University Press & Assessment Research Report. <https://www.cambridgeassessment.org.uk/Images/665425-formal-non-formal-and-informal-learning-what-are-they-and-how-can-we-research-them-.pdf>
- Kalz, M. (2015). Lifelong learning and its support with new technologies. *International Encyclopedia of the Social & Behavioral Sciences* (2nd ed.), 93–99. <https://doi.org/10.1016/B978-0-08-097086-8.92006>
- Kavanagh, D., Lightfoot, G., & Lilley, S. (2021). Are we living in a time of particularly rapid social change? And how might we know? *Technological Forecasting and Social Change*, Volume 169, 120856, ISSN 0040-1625. <https://doi.org/10.1016/j.techfore.2021.120856>
- Laal, M. (2011). Lifelong learning: what does it mean? *Procedia – Social and Behavioral Sciences*, 28, 470–474. <https://doi.org/10.1016/j.sbspro.2011.11.090>
- Montgomery, R. L. (1991). The Spread of Religions and Macrosocial Relations. *Sociological Analysis*, 52(1), 37–53. <https://doi.org/10.2307/3710714>
- Morrison-Smith, S., & Ruiz, J. (2020). Challenges and barriers in virtual teams: a literature review. *SN Appl. Sci.* 2, 1096. <https://doi.org/10.1007/s42452-020-2801-5>
- Murshed, M., Apergis, N., Alam, M. S., Khan, U., & Mahmud, S. (2022). The impacts of renewable energy, financial inclusivity, globalization, economic growth, and urbanization on carbon productivity: Evidence from net moderation and mediation effects of energy efficiency gains. *Renewable Energy*, 196, 824-838. <https://doi.org/10.1016/j.renene.2022.07.012>
- NRC. (2012). *Education for Life and Work: Developing Transferable Knowledge and Skills in the 21st Century. Importance of Deeper Learning and 21st Century Skills*. Washington, DC: The National Academies Press. <https://doi.org/10.17226/13398>
- Olcott, D. (2022). Book Review: The 60-Year Curriculum: New Models for Lifelong Learning in the Digital Economy. *Journal of Learning for Development*. 9. 145-150. <https://jl4d.org/index.php/ejl4d/article/view/630/755>

- Osborne, M., & Sim, S. K. (2022). Lifelong Learning in Asia: A Brief Tour. In: Evans, K., Lee, W.O., Markowitsch, J., Zukas, M. (eds) *Third International Handbook of Lifelong Learning*. Springer International Handbooks of Education. Springer, Cham. [https://doi.org/10.1007/978-3-030-67930-9\\_24-1](https://doi.org/10.1007/978-3-030-67930-9_24-1)
- Rose, N. (2023). The "Social-Friendly Learning-Instructional Theory". *Creative Education*, 14(03), 578-606. <https://doi.org/10.4236/ce.2023.143040>
- Schöley, J., Aburto, J. M., Kashnitsky, I., Kniffka, M. S., Zhang, L., Jaadla, H., Dowd, J. B., & Kashyap, R. (2022). Life expectancy changes since COVID-19. *Nature Human Behaviour*, 6(12), 1649-1659. <https://doi.org/10.1038/s41562-022-01450-3>
- Twenge, J. M., Sherman, R. A., & Wells, B. E. (2015). Changes in American Adults' Sexual Behavior and Attitudes, 1972–2012. *Arch Sex Behav* 44, 2273–2285.
- Walcutt, J. J., & Schatz, S. (Eds.). (2019). *Modernizing Learning: Building the Future Learning Ecosystem*. Washington, DC: Government Publishing Office. License: Creative Commons Attribution CC BY 4.0 IGO. <https://adlnet.gov/assets/uploads/Modernizing%20Learning.pdf>
- Yilmaz, I., & Morieson, I. (2023). Religions and the Global Rise of Civilizational Populism, *Palgrave Studies in Populisms*. ISSN 2731-3069 ISSN 2731-3077 (electronic), ISBN 978-981-19-9051-9 ISBN 978-981-19-9052-6 (eBook). [https://doi.org/10.1007/978-981-19-9052-6\\_1](https://doi.org/10.1007/978-981-19-9052-6_1)
- Zhang, Z., Hsieh, N., & Lai, W.-H. (2023). Social relationships in later life: Does marital status matter? *Journal of Social and Personal Relationships*, 0(0). <https://doi.org/10.1177/02654075231163112>



# The Emotional Intelligence of the Leader – Is It a Must?

Silvena Yordanova<sup>1</sup> 

Received: October 10, 2023

Accepted: November 17, 2023

Published: March 16, 2024

## Keywords:

Empathy;  
Emotional intelligence;  
Emotional control;  
Leadership



Creative Commons Non Commercial CC BY-NC: This article is distributed under the terms of the Creative Commons Attribution-Non-Commercial 4.0 License (<https://creativecommons.org/licenses/by-nc/4.0/>) which permits non-commercial use, reproduction and distribution of the work without further permission.

**Abstract:** *The leader is a fascinating figure with his behavior, and his vision for development and is a complete role model. He not only aims to bring his associates together but is mainly concerned with team building and solving problems of all kinds, including interpersonal ones. Therefore, the leader is emotionally intelligent, and able to unite people from different cultures, thus showing empathy and his inherent intelligence, namely on an emotional level. The current paper introduces emotional intelligence, by providing arguments why a leader needs to be emotionally intelligent. At the same time, the employee benefits of being led by an emotionally intelligent leader are also presented. Cases on emotional intelligence are also presented.*

## 1. INTRODUCTION

Leaders face many challenges in their daily life activities. Besides setting goals and creating the vision for the development of the organization, their main task is to create a successful team. In this regard, in addition to being good visionaries, they also need to possess a complex of skills, such as interpersonal to be effective in solving problems. The main problems in an organization arise from the communication process, therefore we are looking for leaders who, in addition to being innovators, are very good communicators and show empathy.

## 2. EMOTIONAL INTELLIGENCE OF THE LEADER

Is the leader emotionally intelligent, and if so, why?

Emotions play a crucial role in our lives and while regulating them is important in general, their importance is enhanced in a work context, where there are different feelings and behavioral rules in the presence of different job demands arising from both horizontal and vertical interpersonal relationships. In their daily work activities, staff continuously invest their work-related emotions, attitudes, and perceptions of work and colleagues. In this regard, the effective management of emotions also contributes to a high degree of professional attitude (Yordanova & Dineva, 2022).

Goleman's (1995) model of emotional intelligence is extremely popular among academics and practitioners and serves as the basis for the development of process-oriented leadership theory by Allen et al. (2012). According to the aforementioned authors, the success of the leader depends on the combination of cognitive processes, personality traits, behavior and competencies that interact with each other (Allen et al., 2012, p. 183). That is why the authors themselves develop three factors and leadership capabilities of EI, namely:

- Context – environmental awareness and group understanding;

<sup>1</sup> Varna University of Management, 13 Oborishte str., 9000 Varna, Bulgaria

- Self-emotional self-perception, honest self-understanding, healthy self-confidence, emotional self-control, authenticity, flexibility, achievements, optimism, initiative;
- Others – Empathy, Citizenship, Inspiration, Influence, Coaching, Agent of change, conflict management, developing relationships, working in a team, and capitalizing on differences (Yordanova & Dineva, 2022).

Emotional intelligence represents the ability to understand and successfully manage our emotions. In this regard, Goldman identified components that create emotional intelligence:

- Self-awareness is expressed in understanding and knowing our own emotions. If we know how and realize what we experience will influence us to make an easier decision. The self-knowledge of the emotional state is important in terms of our self-regulation as individuals.
- An emotionally intelligent leader is not only aware of his feelings, but above all he knows how to control them. Effective self-control of emotions allows one to easily reach the set goals without the cost of excessive stress. For example, a narcissistic leader uses fear to manipulate and control subordinates more easily. The emotionally intelligent leader aims to bring his team together by being able to keep his emotions so that he does not provoke stressful situations.
- An emotionally intelligent leader is not only self-aware and self-controlled in his emotional state, but is also self-motivated and thus is an example for his followers by his purposefulness and vision for development.
- Emotional intelligence includes empathy, such as the ability to feel the emotion of the other person with whom we communicate. Contrasted with destructive leaders such as narcissists, manipulators, etc., who certainly do not possess any tolerance and are unable to show sympathy to their co-workers, the emotionally intelligent leader has this gift that not all people possess, but which is very useful because it concerns the sensitivity of the individual and his tendency to respond to socially significant phenomena in society. Toxicity in the behavior of the narcissistic leader finds expression in aggression and his lack of ethics, as it happens (Yordanova & Dineva, 2022). For this purpose, it is good to gather evidence of how specifically its actions defame or attempt to damage the reputation of your colleagues. Usually, narcissists are productive for the organization, but they create a toxic organizational climate around them, not allowing competition, driven by their sick egos (Yordanova & Dineva, 2022).

Empathy is inherent in the social professions, where communication is a very important element as part of the profession of the teacher, the social worker, or the doctor.

Why should an organizational leader possess emotional intelligence?

The first argument for the need for a leader to be emotionally intelligent stems from the essence of his work, namely the interaction with people and the need to understand and accept the problem from their perspective. To be able to effectively and efficiently manage his team, the leader must be an excellent communicator i.e. not only be able to speak, but also to listen and take to heart the problems of his employees, in order to more easily connect them to the goals of the organization. In other words, emotionally intelligent leaders are more willing to show empathy for the problems of their associates (George, 2000).

According to the research, managers with a high level of emotional intelligence are more productive when they have to solve controversial issues, resulting from organizational conflict (Côté & Miners, 2006).

On the other hand, leaders possessing emotional intelligence make decisions more successfully, as they feel and take into account the emotions of other employees, on the other hand, they are self-controlled and master their emotions in a conflict situation. This circumstance is a prerequisite for more effective decision-making as well as making the organization more productive (Goleman, 1995).

An emotionally intelligent leader is always motivated in this way as well is an excellent role model for his team to follow. In contrast to the narcissistic leader or manipulator who is always self-promoting and ignoring on purpose the achievements of other employees, an emotionally intelligent leader always gives a positive and highly constructive assessment of his team, thus motivating and inspiring them even more through his positive example (Yordanova & Dineva, 2022).

Driven by their empathy, emotionally intelligent leaders can involve their associates, encourage them, and successfully involve them in the work task, increasing their loyalty as well. In the case of such a leader, employees are motivated to work because they are treated with respect and are more dedicated and loyal to their leader.

Unlike the narcissist, who creates a toxic atmosphere in the workplace in his constant pursuit of self-aggrandizement and destruction of his competitors, the emotionally intelligent leader creates an extremely positive work environment and thus retains the best employees.

### 3. CASE STUDIES

Exemplary case studies to stimulate emotional intelligence.

*Case study 1: Your employee is constantly late in handing in his/her reports, with the last week being late for work by half an hour. After talking with you, as his supervisor, it becomes clear that he has family problems. He is facing a divorce and is having difficulties with the arrangement of viewing children. How would you deal with this employee in this particular situation?*

Option 1: A work-oriented leader. Shows no interest in the welfare of its employees. The main criterion for their success rate is measured in their productivity, namely whether they achieve the goals set by the management.

Option 2: Employee-oriented leader. In conversation with the employee, will discuss what the problem is and how management sees its solution. If that leader also has some degree of emotional intelligence, he will show or empathize or will propose a mutually acceptable solution to both sides, for example, working from home in case the job allows it or additional employment from home.

*Case study 2: You as a team leader strive to achieve the best results. You notice that the work of one of your best employees has recently been slow, poor quality of reports. How would you proceed bearing in mind that the deadline for handing over the whole project coming up?*

Option 1: You will reprimand him because he lowered his work performance, and thus affects the quality of the entire project. You'll threaten him with a pay cut if he doesn't improve in a week.

Option 2: You will talk to him as a leader with emotional intelligence. You will tell him that he is a key player for you and you rely on him a lot and will ask if any personal issues have affected his current results.

## 4. CONCLUSION

To summarize, a leader's emotional intelligence is needed in today's intercultural environment. There are several successful strategies for its improvement, namely:

1. Strive for non-critical observation and analysis. The goal is to clarify the cause of the occurrence.
2. To trace our reactivity to other people, in this sense whether someone else's approval is sought or there is criticality towards others.
3. Is the self-assessment realistic, are we aware of our emotions and can control them. Self-assessment and subsequent self-control are objective prerequisites for increasing the emotional intelligence of both us as employees and in terms of our perception of the leader.
4. Evaluation of our reaction in case of force majeure or stressful situations reflects another aspect of our motivation. If in stressful situations, we transfer the responsibility to other persons, this testifies to our emotional immaturity. A successful leader not only solves problems but is also aware of the responsibility he is taking on.




## References

- Allen, S. J., Shankman, M. L., & Miguel, R. F. (2012). Emotionally intelligent leadership. *Journal of Leadership Education*, 11(1), 177–203. <https://doi.org/10.12806/V11/I1/TF1>
- Côté, S., & Miners, C. T. (2006). Emotional intelligence, cognitive intelligence, and job performance. *Administrative Science Quarterly*, 51(1), 1–28. <https://doi.org/10.2189/asqu.51.1.1>
- George, J. M. (2000). Emotions and leadership: The role of emotional intelligence. *Human Relations*, 53(8), 1027–1055. <https://doi.org/10.1177/0018726700538001>
- Goleman, D. (1995). Emotional Intelligence. Available at: <https://asantelim.files.wordpress.com/2018/05/daniel-goleman-emotional-intelligence.pdf>
- Yordanova, S., & Dineva, S. (2022). Emotion Regulation at Work: Employee and Leader Perspectives. Chapter 6. *Advancing Interpersonal Emotion Regulation and Social Regulation*. IGI-Global. ISBN13: 978166842478





# Innovative Careers Ahead: Adapting to New Occupations and Competencies in the Future Workforce

Anton Vorina<sup>1</sup>   
Nikolina Vrcelj<sup>2</sup>   
Vuk Bevanda<sup>3</sup> 

Received: August 22, 2023  
Accepted: November 29, 2023  
Published: March 16, 2024

## Keywords:

Future competencies;  
Innovative career;  
New occupation



Creative Commons Non Commercial CC BY-NC: This article is distributed under the terms of the Creative Commons Attribution-Non-Commercial 4.0 License (<https://creativecommons.org/licenses/by-nc/4.0/>) which permits non-commercial use, reproduction and distribution of the work without further permission.

**Abstract:** *The rapid evolution of technology, automation, and globalization is causing big changes in the workforce. This is making us think differently about jobs and skills. In the paper, we explore the new trends that are shaping the job market. We look at three important topics about the future of work. First, we try to predict what new jobs will appear and what will make them happen. Second, we study the skills that are becoming more important for doing well in workplaces that are changing. Lastly, we closely examine how humans and robots interact at work, looking at how much robots might replace humans and what that means for jobs. To do this, we analyzed articles published between 2018 and 2023. We found that adaptability, creativity, critical thinking, and being good with digital technology are very important skills during these big changes.*

## 1. INTRODUCTION

The world is on the crossover of a transformative era, where advances in technology and automation are reshaping the landscape of work and employment. As we navigate this evolving terrain, it becomes crucial to explore the emergence of new occupations and the competencies that will define the future workforce. This paper aims to address two fundamental questions: What new occupations will develop in the future? What will be the new competencies required of workers?

By addressing these two essential questions, this paper aims to shed light on the transformative changes happening in the world of work. The insights gained from this exploration will enable policymakers, educators, and individuals to make informed decisions and develop strategies to navigate the future job market successfully. As we embrace the challenges and opportunities of new occupations and competencies, we can shape a future workforce that is resilient, adaptable, and equipped to thrive in an era of technological advancements and automation.

This paper is grounded in a thorough and rigorous literature review conducted using established academic databases, including Google Scholar and SSRN. The search strategy employed focused on relevant keywords such as "Future Competencies," "Future Occupation," and "Human vs. Robot".

To ensure the currency of the information, only articles published within the timeframe of 2018 to 2023 were considered for inclusion in this review. By utilizing these reputable sources and a targeted selection process, we aim to provide an up-to-date and comprehensive examination of the subject matter.

<sup>1</sup> Celje School of Economics, Higher Vocational College, Mariborska 2, 3000 Celje, Slovenia

<sup>2</sup> Association of Economists and Managers of the Balkans – Udekom Balkan, Ustanička 179, Belgrade, Serbia

<sup>3</sup> Faculty of Social Sciences, Bulevar umetnosti 2a, 11070 Belgrade, Serbia

## 2. OCCUPATIONS OF THE FUTURE

The increasing use of automation, artificial intelligence, and other technologies indicates that the role of humans in the economy will drastically diminish, leading to the elimination of millions of jobs. COVID-19 in 2020 has already accelerated this effect and is likely to further expedite and potentially establish digitization in certain areas permanently. However, while these technologies will eliminate some jobs, they will also create many others. Governments, companies, and individuals need to understand these changes as they plan for the future (Strack et al., 2021, p. 4).

Modern employment trends suggest that employers are equally, if not more, interested in an individual's behavioral traits and experiences in a specific field rather than formal education. Therefore, it is not necessary to strictly seek a new job within the framework of one's acquired education. Instead, a broader perspective can be considered, and one can choose a profession that offers greater prospects and a more secure future based on contemporary guidelines. Futurists are attempting to determine which jobs will emerge in the next 20 years, estimating that approximately 60% of jobs have not yet been discovered (Poklici prihodnosti, 2023).

Researchers predict that in the next twenty years, a plethora of occupations will emerge that are currently unknown but for which market needs are slowly beginning to manifest. These types of professions are not only related to the rapid development and adaptation of technology in everyday life and systems but also involve the growing demand for new experts in areas related to interpersonal relationships, diverse generational needs, and changes in demographic trends. Some new occupations have already gained traction, yet there is still no vertical educational plan for them. Perhaps one of the essential characteristics of these new occupations and the new job market is precisely that the initial education serves as a starting point, upon which individuals build their dynamic careers through continuous learning, complementing, upgrading, and exchanging knowledge, experiences, and personal plans. (Žnidaršič, 2021).

Due to job automation and the global recession, workers have been losing their jobs at a faster rate than in previous years. The current shift in the division of labor among humans, machines, and algorithms could potentially replace 85 million jobs worldwide in the next five years, while simultaneously creating 97 million new jobs that are better adapted to this new division of labor. Companies expect to replace approximately 6% of their entire workforce by 2025, with every second worker needing to be retrained. Those who remain in their current positions will need to update 40% of their knowledge to adapt to the changing job market. By 2025, organizations aim to train over 70% of their employees to ensure a smooth transition to future job roles. On average, workers will be required from 2 weeks to 5 months to obtain the new knowledge and skills necessary for transitioning into new jobs (World Wide Economics, 2020).

Based on different authors, here are some examples of new professions that are already sought-after and established in the market:

1. Climate Solutions Advisor for Seniors. A Climate Solutions Advisor for Seniors will have knowledge of the health effects of weather events and will be able to design creative strategies specifically tailored to the needs of different individuals and communities. They will possess excellent communication skills for working with the government and older adults, as well as empathy and an understanding of the needs of seniors. They will also have technological knowledge that enables them to design and provide advice on monitoring and control systems. (Browse the 100 jobs of the future, 2023).

2. Genetic Specialist. Gene editing is a controversial topic as it allows us to play a role somewhat like a God. However, apart from choosing the eye color or height of our newborn, there are also medical applications. With the power of gene editing and the use of genetic technologies, we will be able to reduce the risk of serious health issues and significantly improve the quality of life for many people ([Best 14 jobs of the future: the most in-demand careers, 2022](#)).
3. Digital Archaeologist: Digital archaeologists use 3D technology for the virtual preservation and conservation of cultural heritage, especially in regions where the destruction of cultural objects is present. They use affordable 3D cameras to capture images, which are then stored in a web-based database ([Žnidaršič, 2021](#)).
4. 3D Printing Specialist: Experts in 3D printing are involved in the development of 3D printing technology and the creation of three-dimensional objects. They cover a wide range of tasks, including technology development, adaptation to different media and materials, and technology promotion ([Žnidaršič, 2021](#)).
5. Idea Manager: An idea manager connects technical developers, users, and clients and is responsible for generating, developing, and implementing innovative ideas. They also facilitate the acquisition of new ideas from various sources, form development teams, and handle the market presentation and launch of products ([Žnidaršič, 2021](#)).
6. Public Relations Manager: A public relations manager is responsible for creating and maintaining a favorable public image of an employer or client. Their tasks include communicating programs, achievements, and positions, responding to media inquiries, organizing press conferences, and managing crisis communications ([Upravljalca družbenih medijev opis poklica in aktualna dela, 2023](#); [Public Relations Manager Job Description, 2023](#)).
7. Data Scientist: A data scientist deals with processing massive amounts of data and manipulating and segmenting it according to clients' needs. They use processed data for process optimization, trend forecasting, searching specific information online, and other similar tasks ([Žnidaršič, 2021](#)).
8. Social Gerontologist: Social gerontologists are human services professionals who advocate for older adults. They address a range of common social, health, personal, and psychological issues faced by older adults. This includes aging and related media stereotypes and workplace discrimination. It encompasses the abuse and neglect experienced by older adults in assisted living facilities. It also includes common mental and physical health issues such as dementia, depression, and disability. Social gerontologists strive to enhance the independence and productivity of older adults. They also help combat prevalent media and societal stereotypes about older adults, such as the misconception that older adults are slow and unable to learn new things. Due to these negative stereotypes, employers tend to avoid hiring older adults, and if they do, they are more likely to lay off an older employee instead of a younger one. Social gerontologists perform a wide range of tasks depending on the job and workplace. This is because there are many ways to enhance the quality of life for older adults and help others understand and appreciate older adults. For example, social gerontologists often advocate for older adults by helping them understand and complete challenging paperwork such as financial, insurance, or retirement forms. They assist older adults in finding health-care services and community resources ([What is social gerontology, 2023](#)).
9. Drone Operator: Drones can help us safely deliver medical supplies, easily assess buildings, and revolutionize delivery services. Drones are becoming part of the social fabric and will become more prevalent in the next decade ([Best 14 Jobs of the Future: The Most In-Demand Careers, 2022](#)).
10. Others such as: Artificial Intelligence (AI) Ethicist, Virtual Reality (VR) Designer, Blockchain Developer, Cybersecurity Analyst, Sustainability Manager, etc.

### 3. SKILLS OF THE FUTURE

In a rapidly changing world, there is also a growing demand for various skills. In recent years, companies have increasingly started to reshape and upgrade their expectations of employees. The better employee of the future (and today) is the one who is more adaptable, learns broadly, and quickly acquires new skills (Makar, 2020).

The Fourth Industrial Revolution, based on digitalization, demands new knowledge. It introduces new jobs and transforms existing ones. It involves large amounts of data obtained in an extremely short time and smart systems that will significantly change the economy. It will primarily require individuals to interactively solve problems, possess organizational skills, think "out of the box," have a clear focus, empathy, and an exceptional ability to adapt quickly to innovations. Personal qualities such as enthusiasm, passion, and energy with which they work will also become important. Flexibility will be necessary in all stages and processes of work. Those who "fall asleep" in the workplace and cannot keep up with the changes will be automatically eliminated by the job market. Their knowledge and competencies will not be competitive (Boštjančič, 2023).

Therefore, it is necessary to invest more in educating people about what digital transformation brings to individuals, companies, and society. Regarding older employees, digital transformation presented an excellent example from which we can learn a lot. The company wanted to create a phone for the elderly but realized that the elderly do not need a different phone; they just need different instructions (Žedanes moramo krepiti kompetence vseh zaposlenih, da bomo pripravljene na delo v prihodnje, 2021).

In the future, some of the competencies mentioned by various authors are:

1. Self-management is important for successfully performing work tasks. This competency refers to adhering to one's values, expressing opinions, keeping promises, establishing work ethics, showing interest, and being self-disciplined. Self-management is also connected to active learning, a competency that ensures the timeliness and depth of our knowledge, and learning strategies that enable us to adapt better to different job positions. Resilience is also crucial in managing one's work behaviors, as it relates to personal and professional adaptability, flexibility in stressful situations, and lifelong learning processes (Makar, 2020).
2. Emotional intelligence. Your ability to be aware of, control, and express your emotions, as well as be aware of others' emotions, describes your emotional intelligence. If you have empathy, and integrity, and collaborate well with others, you demonstrate good emotional intelligence. The human ability to connect with others is not easily replaceable by machines, which is why those with high emotional intelligence will be in demand (The 10 vital skills you will need for the future of work, 2022).
3. Digital literacy is a skill that becomes increasingly important in the workplace with technological advancements. Being digitally literate means understanding the terminology for social networks and mobile applications. Employers may prefer employees who are digitally literate and proficient in technology (Birt, 2022).
4. Cultural literacy. In a globalized world, it is essential to have a good understanding of cultural differences in language, generation, race, gender, sexual orientation, religion, or political orientation. This understanding helps leaders, supports team building, and contributes to forming better international partnerships (Talin, 2022).
5. Negotiation. People in technical professions will soon be expected to demonstrate greater interpersonal skills, so being able to negotiate with colleagues, managers, clients, and teams will be crucial (10 Skills You Need for Future Employment, 2023).

6. Computational thinking. Computational thinking primarily involves seeking deeper truths and questioning established facts. Such thinking is highly valued in the business world as it can lead to improvements, new discoveries, or positive changes. Individuals who always seek to learn more and are not satisfied with simple explanations are highly appreciated in the business world (*Kompetence prihodnosti*, 2023).
7. Accepting and facing challenges. Employers seek individuals who are willing to take on new challenges, whether it's learning a new language, transitioning to a different computer program, or changing career fields. Don't be afraid to accept new challenges - courage will serve you well in the future (*Kompetence prihodnosti - jih že imate?*, 2020).

#### 4. HUMAN VS. ROBOT OF THE FUTURE

Robots will replace humans, but not completely. According to *Želko (2020)*, 17 years ago, 90% of all robots were primarily found in the automotive industry. *Sarkar's (2020)* study suggests that in the next 11 years, China alone will have 14 million robots in operation. However, this is not the case at present.

*Želko (2020)* categorizes robots based on their type of operation and appearance, including humanoid robots that resemble humans, autonomous robots, teleoperated robots, and lesser-known augmentative robots, which replace limbs and play a significant role in medicine, rapidly advancing in development. Most robots we use can be found in our homes, such as washing machines, vacuum cleaners, call center assistants, and dryers, among others. Robotics is progressing notably in the medical field, assisting doctors with organ enlargements, prosthetic limbs, and receptor robots, while high-tech machines are being developed in the industrial sector. Additionally, robotics is increasingly being utilized in education.

Artificial intelligence (AI) is a significant area of development, as described by *Blažič (2022)*, and it has rapidly made its way into classrooms, providing tools such as translators, math assistants, and digital aids, revolutionizing the learning process.

*Doyle (2021)* states in an article that by 2030, every third worker in the United States will delegate the majority or at least some of today's tasks to robots. Many existing jobs will even disappear. Robots currently serve as valuable assistants, easing our workload and saving time on household chores and similar tasks. However, it is evident that robots cannot fully replace our work. Automation will undoubtedly replace certain jobs, but no robot can substitute for human thinking, empathy, and energy, as *Sarkar (2020)* theoretically confirmed. Robots will take on labor-intensive tasks, increasing the value and appreciation of human work. Numerous jobs involving empathy will remain in the hands of humans, as they are difficult to control, require creativity, and involve caring for the environment, among other aspects. Human interaction is particularly crucial in healthcare, where warmth and kind words hold significant importance and will remain essential in our lives.

Preparing for automation and robotization requires continuous learning, adaptability to new situations, acquiring new skills, and managing information without becoming overly stressed.

## 5. DISCUSSION, ANSWERING THE RESEARCH QUESTIONS

*The first research question is What new occupations will emerge in the future?*

According to [Strack et al. \(2021, p. 4\)](#), due to increasing automation, the use of artificial intelligence, and technology, the role of humans in the future will diminish, resulting in the elimination of millions of jobs.

Examples of these professions, listed by [Žnidaršič \(2021\)](#), include climate solutions advisor for seniors, genetics expert, 3D printing specialist, digital archaeologist, idea manager, public relations manager, data scientist, social media manager, social gerontologist, and drone operator.

According to the [World Economic Forum \(2020\)](#), it is projected that 97 million new jobs could emerge worldwide in the next five years. Companies expect to replace approximately 6% of the total workforce by 2025.

*The second research question is What will be the new competencies required of workers?*

[Ravindran \(2023\)](#) explains in his article that foreign language proficiency will be crucial in the future. According to a study by Common Sense Advisory, companies can lose up to \$2.3 million per year due to language barriers. Additionally, up to 60% of cross-border business transactions are estimated to fail due to language barriers. Poor communication also negatively impacts employee productivity. [Ravindran \(2023\)](#) mentions a report by the McKinsey Global Institute, which claims that upskilling and reskilling employees could add \$6.5 trillion to global GDP by 2030. In his article "The Future of Business Success in the Digital Era," [Chukwube \(2023\)](#) emphasizes the importance of a skilled and competent workforce. According to the World Economic Forum's estimation, by 2025, the redistribution of work between humans and machines may lead to the migration of 85 million jobs.

Due to the rapid development of the world, there is also a growing need for various types of professionals. Companies have significantly reshaped and upgraded their expectations of employees in recent years. It is crucial for companies to recognize the importance of a talented workforce. By investing in their employees, companies can develop a qualified and motivated workforce capable of adapting and keeping pace with emerging technologies and market trends.

## 6. CONCLUSION

The future of work is undergoing significant changes driven by digitalization, automation, and emerging technologies. This shift necessitates a new set of competencies for workers to thrive in the evolving landscape. The research has highlighted the importance of adaptability to constant change, emotional intelligence, digital literacy, self-management skills, effective negotiation abilities, and cultural literacy as key competencies for future workers.

Experts predict a diminishing role for humans, resulting in the elimination of millions of jobs ([Strack et al., 2021](#)). Futurists estimate that approximately 60% of future jobs have not yet been discovered and will emerge in the next 20 years, particularly in areas related to technology development, interpersonal relationships, generational needs, and demographic shifts

(Poklici prihodnosti, 2023). Examples of potential new professions include climate solutions advisors, genetics experts, 3D printing specialists, digital archaeologists, and social media managers (Žnidaršič, 2021). The World Economic Forum projects the emergence of 97 million new jobs globally within the next five years (World Economic Forum, 2020).

The fourth industrial revolution, characterized by digitalization and new knowledge, will demand specific skills (Boštjančič, 2023). Emotional intelligence, digital literacy, self-management skills, effective negotiation abilities, and cultural literacy are identified as key competencies (Birt, 2022; Talin, 2022; Makar, 2020). Additionally, foreign language proficiency is emphasized as crucial, considering the financial and communication impacts of language barriers (Ravindran, 2023). The upskilling and reskilling of employees are seen as vital investments, with the potential to contribute trillions to global GDP and mitigate job migration (Ravindran, 2023; Chukwube, 2023; World Economic Forum, 2020).

Given the rapid development of the world, companies must recognize the importance of a talented and adaptable workforce. By investing in their employees' skills and competencies, companies can cultivate a qualified and motivated workforce capable of navigating emerging technologies and market trends (Chukwube, 2023). The evolving landscape calls for reshaped expectations and upgraded skills from employees, ensuring they can thrive in the changing job market (World Economic Forum, 2020).

The significance of foreign language proficiency has emerged, as language barriers can have substantial financial implications for businesses. Upskilling and reskilling initiatives are seen as crucial for individuals and organizations to navigate the changing job market successfully. While technological advancements offer opportunities for economic growth, they also raise concerns about potential job displacement.

The future of work necessitates a comprehensive approach that integrates technical skills with fundamental human attributes, underscoring the significance of continual learning, adaptability, and adeptness in navigating the intricacies of a swiftly evolving global landscape. Furthermore, we will also have to get used to working together with robots in the same space.

## References

- 10 Skills You Need for Future Employment. (2023). Retrieved February 7, 2023, from <https://jobs-au.pwc.com/au/en/10-skills-you-need-for-future-employment>.
- Best 14 Jobs of the Future: The Most In-Demand Careers. (2022). Retrieved January 31, 2023, from <https://www.futurelearn.com/info/blog/14-jobs-of-the-future>.
- Birt, J. (2022). 18 Future Skills for the Workplace. Retrieved January 31, 2023, from <https://www.indeed.com/career-advice/career-development/future-skills>.
- Blažič, A. (2022). Umetna inteligenca v izobraževanju: izzivi in priložnosti. Retrieved January 31, 2023, from <https://school-education.ec.europa.eu/sl/insights/viewpoints/ai-education-challenges-and-opportunities>.
- Boštjančič, S. (2023). Kompetence prihodnosti za tiste, ki si upajo nemogoče. Retrieved January 24, 2023, from <https://www.optius.com/delodajalci/nasveti-za-upravljanje-s-kadri/kompetence-prihodnosti-za-tiste-ki-si-upajo-nemogoce/>.
- Browse the 100 Jobs of the Future. (2023). Retrieved January 31, 2023, from <https://100jobsofthefuture.com/browse/>.

- Chukwube, M. (2023). The Future of Business Success in the Digital Age. Retrieved February 14, 2023, from <https://www.techopedia.com/the-future-of-business-success-in-the-digital-age/2/34932>.
- Doyle, A. (2021). Is Your Job at Risk of Automation? Retrieved February 14, 2023, from <https://www.thebalancemoney.com/robot-takeover-is-your-job-at-risk-of-automation-4169632>.
- Kompetence prihodnosti – jih že imate? (2020). Retrieved February 7, 2023, from <https://si.trenkwalder.com/novice-in-blog/kompetence-prihodnosti-jih-ze-imate/>.
- Kompetence prihodnosti. (2023). Retrieved February 7, 2023, from <https://www.optius.com/delodajalci/nasveti-za-upravljanje-s-kadri/kompetence-prihodnosti/>.
- Makar, A. (2020). Preoblikovanje delovnih mest - katere so kompetence prihodnosti? Retrieved January 24, 2023, from [https://kompetenca.si/nase\\_novice/87/preoblikovanje\\_delovnih\\_mest\\_katere\\_so\\_kompetence\\_prihodnosti/](https://kompetenca.si/nase_novice/87/preoblikovanje_delovnih_mest_katere_so_kompetence_prihodnosti/).
- Poklici prihodnosti. (2023). Retrieved January 24, 2023, from <https://www.dijaskisvet.si/dijaski-os/clanki/poklici-prihodnosti/>.
- Public Relations Manager Job Description. (2023). Retrieved January 31, 2023, from <https://www.lhh.com/us/en/insights/job-descriptions/public-relations-manager/>.
- Ravindran, P. (2023). The future of work: A shift towards soft skills and constant upskilling. Retrieved February 14, 2023, from <https://www.peoplesmatters.in/article/training-development/the-future-of-work-a-shift-towards-soft-skills-and-constant-upskilling-36762>.
- Sarkar, A. (2020). Can robots replace humans? Retrieved January 24, 2023, from <https://whataftercollege.com/robotics-embedded-system/can-robots-replace-humans/>.
- Strack, R., Carrasco, M., Kolo, P., Nouri, N., Priddis, M., & George, R. (2021). The future of jobs in the era of AI (p. 4). Retrieved January 24, 2023, from <https://web-assets.bcg.com/f5/e7/9aa-9f81a446198ac5402aaf97a87/bcg-the-future-of-jobs-in-the-era-of-ai-mar-2021-r-r.pdf>.
- Talin, B. (2022). 23 skills of the future – Important skills for the jobs of the 21st century. Retrieved January 24, 2023, from <https://morehandigital.info/en/23-skills-of-the-future-important-skills-for-the-jobs-of-21th-century/>.
- The 10 vital skills you will need for the future of work. (2022). Retrieved January 31, 2023, from <https://myfuture.cimaglobal.com/career-insights/the-10-vital-skills-you-will-need-for-the-future-of-work/>.
- Upravljalca družbenih medijev opis poklica in aktualna dela. (2023). Retrieved January 31, 2023, from <https://www.zaposlitev.info/kariera/upravljalca-druzbenih-medijev/>.
- What is social gerontology. (2023). Retrieved January 31, 2023, from <https://www.bestvalueschools.com/faq/what-is-social-gerontology/>.
- World Economic Forum. (2020). Recession and Automation Changes Our Future of Work, But There are Jobs Coming, Report Says. Retrieved August 20, 2023, from <https://www.weforum.org/press/2020/10/recession-and-automation-changes-our-future-of-work-but-there-are-jobs-coming-report-says-52c5162fce/>.
- World Wide Economics. (2020). What will the future of jobs be like. Retrieved February 28, 2023, from <https://www.youtube.com/watch?v=eH1fFdzJAw>.
- Že danes moramo krepiti kompetence vseh zaposlenih, da bomo pripravljeni na delo v prihodnje. (2021). Retrieved January 24, 2023, from <https://www.srips-rs.si/en/news/all-news-asi/news-asi/ze-danes-moramo-krepiti-kompetence-vseh-zaposlenih-da-bomo-pripravljeni-na-delovno-v-prihodnje>.
- Želko, M. (2020). Vse, kar morate vedeti o robotizaciji. Retrieved January 24, 2023, from <https://www.slovenec.org/2022/01/25/vse-kar-morate-vedeti-o-robotizaciji/>.
- Žnidaršič, S. (2021). Poklici prihodnosti. Retrieved January 24, 2023, from [http://www.talentiran.si/index.php?option=com\\_content&view=article&id=1731:poklici-prihodnosti&catid=110&Itemid=547](http://www.talentiran.si/index.php?option=com_content&view=article&id=1731:poklici-prihodnosti&catid=110&Itemid=547)





# The Risks of Quiet Quitting: Exploring the Impact of Telework on Employee Psychological Departure

Dusana Alshatti Schmidt<sup>1</sup>   
Matus Barath<sup>2</sup> 

Received: August 4, 2023  
Accepted: November 23, 2023  
Published: March 16, 2024

## Keywords:

Quiet quitting;  
Telework;  
Teleworker;  
Disengagement



Creative Commons Non Commercial CC BY-NC: This article is distributed under the terms of the Creative Commons Attribution-Non-Commercial 4.0 License (<https://creativecommons.org/licenses/by-nc/4.0/>) which permits non-commercial use, reproduction and distribution of the work without further permission.

**Abstract:** *The rise of teleworking has revolutionized the way of working, allowing employees to carry out their duties remotely and offering newfound flexibility. The long-term impact of teleworking has fully developed many negative factors that were already present in traditional work settings. One concern that has been raised is whether telework can lead to quiet quitting. Given that the COVID-19 pandemic and the subsequent increase in remote work have highlighted the phenomenon of quiet quitting, it is essential to examine the pre-pandemic context to develop a comprehensive understanding of teleworkers' potential to silently disengage from work. Drawing on existing literature, this paper aims to analyze the risks of quiet quitting and investigate whether teleworkers are susceptible to engaging in quiet quitting by examining the potential factors before the pandemic. This can help organizations to identify and address potential challenges, and foster an environment that promotes employee engagement, and long-term commitment.*

## 1. INTRODUCTION

Over the past decade, telework has gained substantial popularity offering employees the flexibility to work from different locations other than the office and enabling organizations to tap into a broader talent pool. Telework is a subset of remote work practices that grant employees more autonomy to work outside of the traditional workplace (office) by utilizing information technology (Athanasidou & Theriou, 2021). While the adoption of remote work on a global scale has accelerated during the COVID-19 pandemic, it has drawn attention to the concept of quiet quitting. Quiet quitting refers to a behavioral pattern exhibited by employees wherein they mentally disengage or disconnect from their work with minimum or no visible signs of intentions to quit. It is employees' strategy to prevent psychological issues like burnout and social concerns such as unemployment by focusing on and performing the minimum required as outlined in their job description (Yıldız, 2023). As telework has become more prevalent, it is crucial to identify whether teleworkers are prone to quiet quitting by providing a pre-pandemic outlook. Examining telework in the pre-pandemic era can uncover valuable insights into the specific factors that may influence teleworkers' intentions to quietly quit, independent of the pandemic-related disruptions. Hence, the paper aims to answer the research question: *“Are teleworkers prone to quiet quitting?”* This study seeks to unravel the intentions of teleworkers to quietly quit their jobs by offering a pre-pandemic perspective that highlights the specific factors that may contribute to their decisions. Focusing on the pre-pandemic period enables a distinction to be made between factors that were prominent in telecommuting contexts before the global health crisis. Understanding the latter can provide valuable insights into designing effective policies that address teleworkers' concerns, and foster an environment that promotes employee retention, engagement, and overall well-being.

<sup>1</sup> Kuwait College of Science and Technology, Doha Area, Kuwait

<sup>2</sup> Faculty of Management, Comenius University Bratislava, Odbojarov 10, 820 05 Bratislava, Slovakia

The paper starts with an introduction, followed by a methodology section. Section two investigates the concept of quiet quitting, providing an in-depth exploration of its characteristics and risk factors discussed from various theoretical perspectives. Section three focuses specifically on the risks of quiet quitting in the context of telework. Section four presents a discussion of the findings and offers directions for future research. Finally, the paper concludes with section five.

### 1.1. Methodology

The study employed a systematic literature review methodology. The review process was guided by the research question, which aimed to synthesize the current knowledge related to two main aspects: quiet quitting and telework (Snyder, 2019). Various databases, including Scopus, Web of Science, ResearchGate, and Google Scholar were used to conduct a literature search. Due to limited literature on quiet quitting, other relevant sources of information were also considered. Articles related to the concept of telework included in the review were only limited to a specific time frame, from 2010 (aligned with the enactment of the US Telework Enhancement Act of 2010) to 2019 (the beginning of the COVID-19 pandemic and the widespread implementation of enforced telework measures). This time frame allowed for a focused examination of the literature on telework practices before the pandemic. The synthesized findings were interpreted and discussed considering the research question and objectives.

## 2. QUIET QUITTING: UNDERSTANDING A SUBTLE FORM OF PSYCHOLOGICAL WITHDRAWAL BEHAVIOR

Quiet quitting is a form of organizational behavior characterized by a lack of visible signs of dissatisfaction or clear intentions to leave. It typically involves a psychological distance or detachment from the work and the organization (Anand et al., 2023). As explained by Yildiz (2023), it represents a passive form of resistance towards active involvement in work potentially used as a coping strategy to prevent burnout. Mahand and Caldwell (2023) recently described quiet quitting as the condition where individuals' commitment and loyalty to their jobs have diminished, leading them to focus solely on meeting the minimum requirements.

The concept of quiet quitting can be classified as a form of psychological withdrawal behavior. Psychological withdrawal behavior as a broader concept involves observable behavioral changes or signs of disengagement, decreased effort, and avoidance. It encompasses different actions that provide a mental disengagement or escape from work, such as daydreaming, moonlighting, cyber-loafing, socializing, or engaging in other distractions (Carpenter & Berry, 2017). Psychological withdrawal behavior is often seen as a coping mechanism employed by employees to create psychological distance from stressors, such as negative work events, to normalize their experiences (Jo & Lee, 2022).

Like psychological withdrawal behavior, quiet quitting is a subtle and internal disengagement with minimal or no observable behavioral changes. Employees who exhibit such behavior aim to preserve their current employment status while resetting their work-life balance and maintaining well-being (Serenko, 2023).

According to Christian (2022), Zenger and Folkman (2022), Anand et al., (2023), and Yildiz (2023) the behaviors commonly associated with quiet quitting encompass:

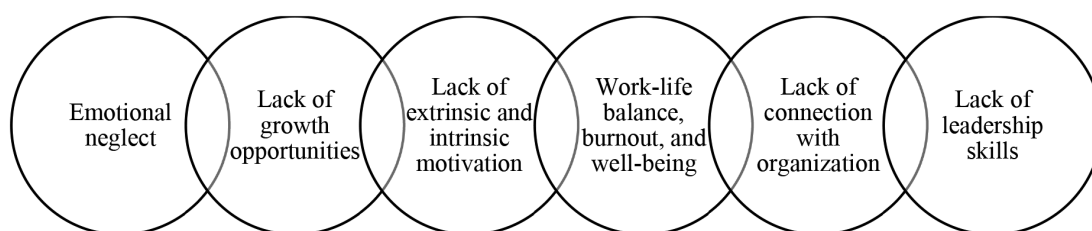
- a. engaging in work strictly within regular working hours, without putting in any overtime,
- b. no response to work-related emails or messages beyond regular working hours,

- c. exhibiting a diminished sense of seriousness and personal investment in work,
- d. minimizing additional work or assignments beyond regular job responsibilities, especially when not paid for it (lack of citizenship behavior).
- e. silence during meetings,
- f. no collaboration on teamwork activities,
- g. late arrival or early departure from work,
- h. an increased number of absences and sick days.

These behaviors can be difficult for managers to detect, as employees may continue to perform adequately in their roles but may not be fully committed to their work or the organization. Both, quiet quitting, and other psychological withdrawal behaviors indicate a lack of engagement, a decline in organizational commitment, and can have negative effects on individual performance and organizational effectiveness.

## 2.1. Exploring Risk Factors of Quiet Quitting

Various authors have identified distinct perspectives that shed light on the underlying causes of quiet quitting summarized in Figure 1.



**Figure 1.** Quiet quitting – underlying causes

**Source:** Own research

*Emotional neglect:* Harter (2022) and Zenger and Folkman (2022) emphasize emotional neglect as a primary driver of quiet quitting. Failing to provide emotional support has a negative effect on the relationship between managers and employees, characterized by distrust and game-playing. Employees pretend to be committed to the organization and prioritize self-preservation as their top concern. Over time, this can lead to distrust and disengagement (Dash & Jena, 2020).

*Lack of growth opportunities:* Harter (2022) highlights the absence of growth opportunities as a primary driver of quiet quitting. When employers fail to offer clear paths for professional growth, employees perceive limited opportunities for career advancement. This perception results in ambiguity and disengagement (Kelly, 2022; Kruse, 2022).

*Lack of extrinsic and intrinsic motivation:* Serenko (2023) highlights the negative impact of poor extrinsic motivation, such as the absence of rewards, recognition, or incentives, on employees, potentially leading to quiet quitting. On the other hand, Esteveny (2022) emphasizes the significance of fair recognition in driving employee engagement and commitment. When employees feel unappreciated or unrecognized for their efforts and achievements it discourages them from having the enthusiasm to work. As a result, their commitment to the organization may diminish, increasing the likelihood of quiet quitting. Moreover, harboring grudges against managers or organizations is identified as another contributing factor. Harboring grudges in the workplace can trigger negative emotions that hinder intrinsic motivation and decrease interest in work activities (van Monsjou et al., 2023).

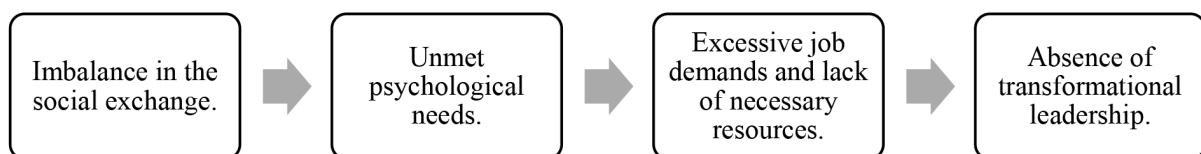
*Work-life balance, burnout, and well-being:* **Esteveny (2022)** emphasizes the importance of employees' desire to prioritize work-life balance, well-being (**Anand et al., 2023**), and prevent burnout (**Serenko, 2023**) as key drivers of quiet quitting. The exhaustion, cynicism, and reduced professional efficacy associated with burnout can lead employees to disengage from their work and exhibit quiet quitting behaviors (**Bakker & Demerouti, 2007**).

*Lack of connection with organization:* **Harter (2022)**, **Zenger and Folkman (2022)** and **Esteveny (2022)** argue that a lack of connection with an organization's purpose can leave employees feeling confused and disengaged, questioning their reasons for being part of that organization. Conversely, when employees perceive their organization is actively caring about issues important to them and contributing to positive change in the world, it imbues their work with meaning and purpose. They find fulfilment in the contributions they make both to the company and society (**DiPietro et al., 2020**). Similarly, employees may lose interest in and dedication to their organizations if they do not believe their jobs are meaningful (**Masterson, 2022**).

*Lack of leadership skills:* According to **Mahand and Caldwell (2023)**, the primary reason behind declining employee commitment is the failure of managers and supervisors to fulfill their essential leadership responsibilities, which involve engaging, empowering, and inspiring employees. In a study by **Princy and Rebeka (2019)**, it is suggested that changes in employee commitment can arise from insufficient job involvement, low self-efficacy, lack of motivation, and low satisfaction. In today's dynamic and highly competitive environment, employees seek a good leadership style as well as a well-structured organizational culture that play vital roles in shaping employee engagement, satisfaction, performance, and organizational success (**Okyere-Kwakye & Otibu, 2016**).

## 2.2. Insights from Theoretical Perspectives

Exploring these risk factors through different theoretical lenses provides a deeper understanding of the complexity of quiet quitting (Figure 2.) and its implications for employee disengagement.



**Figure 2.** Quiet quitting – underlying causes from theoretical perspectives

**Source:** Own research

Emotional neglect, lack of growth opportunities, and lack of intrinsic and extrinsic motivation can be explained through social exchange theory and equity theory. Social exchange theory suggests that the action or behavior of an individual is contingent on the reward reaction of others. In other words, the behavior of employees is motivated by expected returns. These could be benefits such as status, information, goods, love, money, and services that a person seeks in social exchange (**Ahmad et al., 2023**). Hence, it can be argued that *quiet quitting is a result of a perceived imbalance in the social exchange where employees no longer feel they receive sufficient rewards, support, or opportunities in return for their effort and contributions.*

Lack of intrinsic and extrinsic motivation, lack of growth opportunities, and lack of connection with organization align with self-determination theory. According to this theory, individuals

aim to satisfy their basic psychological needs for competence (to be capable), autonomy (to make choices), and relatedness (to connect or collaborate) (Ryan & Deci, 2022). While poor extrinsic motivation can undermine employees' sense of competence and autonomy, the absence of recognition and lack of connection with the organization fails to fulfill employees' need for relatedness. Furthermore, lack of growth opportunities disables employees from choosing their career path (autonomy), acquiring new knowledge, skills, and abilities (competence), and building social connections or collaboration (relatedness). Therefore, it can be argued that *quiet quitting is a result of unmet employees' psychological needs*.

Work-life balance, burnout, and well-being support the principle of the job demands-resources model. According to the model, when a job requires employees to put in significant effort without adequate sufficient recovery, job demands can turn into job stressors. Hence, when employees experience a disturbance of the equilibrium between job demands (excessive workload, long working hours) and personal resources (energy), it can lead to burnout and reduced well-being (Bakker & Demerouti, 2007). Consequently, it can be argued that *quiet quitting is a result of excessive job demands and a lack of necessary resources*.

The role of leadership in employee commitment aligns with transformational leadership theory. Transformational leaders engage, encourage, empower, and inspire employees, fostering commitment and dedication. Lack of these leadership competencies can result in decreased employee commitment and engagement (Northouse, 2019). Therefore, it can be argued that *quiet quitting is a result of the absence of transformational leadership in organizations*.

### 3. RISKS OF QUIET QUITTING IN THE CONTEXT OF TELEWORK

Fonner and Roloff (2010) provide evidence that telework has a positive impact on well-being and job satisfaction by mitigating stressors commonly associated with conventional work settings. Considering the job demands-resources model, working outside the traditional office environment diminishes teleworkers' exposure to stress-inducing factors such as interruptions, distractions, and excessive meetings. Consequently, by providing increased autonomy and flexibility in determining work location and schedule, teleworking reduces psychological demands and enhances available resources. This, in turn, allows for more leisure time, recovery, and the alleviation of job demands, such as work pressure. In line with the findings of Kelliher and Anderson (2010), teleworkers who perceive greater autonomy also demonstrate heightened commitment to their employer.

However, there are negative effects associated with telework, including increased role ambiguity and reduced support and feedback from colleagues and supervisors. The study by Davis and Cates (2013) presents evidence indicating that employees working in an external environment may face challenges in experiencing a sense of relatedness due to a lack of human contact and contact with the organization. The lack of social engagement diminishes the level of organizational identification among teleworkers, impeding their ability to align with the values and goals of the organization (Taskin & Bridoux, 2010; Bartel et al., 2012; Bentley et al., 2016). The lack of face-to-face interaction can contribute to feelings of isolation and disconnection, which can negatively impact teleworkers' motivation, engagement, and emotional well-being. Sardeshmukh et al. (2012) observed that telework is negatively related to both exhaustion and job engagement. This means that teleworking can lead to feelings of exhaustion and reduced engagement in job tasks depending on the level of job demands (such as workload, and time pressures) and availability of job resources (such as support, and feedback).

Moreover, teleworkers may face challenges in terms of career advancement due to reduced visibility and opportunities for professional growth (Maruyama & Tietze, 2012). This lack of visibility hinders managers and supervisors from fully recognizing the teleworkers' potential, creating an inequality in career advancement opportunities for teleworkers.

The study by Overbey (2013) found that a transformational leadership style might not be as effective in retaining teleworkers. On the other hand, a laissez-faire leadership style could be more positively associated with their intention to stay with the organization. A significant correlation between transactional leadership and teleworkers' intentions to leave the organization was not discovered.

Overall, research conducted by Caillier (2013) suggests that teleworking does not significantly affect employees' intentions to quit their jobs. Turnover intentions are influenced more by other factors, such as job satisfaction. Furthermore, the study found that social factors, like being denied teleworking privileges, have a greater impact on turnover intentions. Employees who are allowed to telecommute frequently or occasionally, or those who don't telework due to technical or job-related reasons, tend to be more engaged (Masuda et al., 2017) and show lower turnover intentions compared to those who are denied this benefit. Employees in organizations that provide telecommuting options are compared to those in organizations without such options.

#### 4. DISCUSSION AND FUTURE RESEARCH DIRECTIONS

The study conducted by Harker Martin and MacDonnell (2012) highlights the positive impact of telework on employee retention and fostering a strong sense of commitment within organizations. However, this research indicates that telework has the potential to reduce work engagement. It becomes evident that addressing well-being, supporting work-life balance, enhancing extrinsic and intrinsic motivation, promoting fair recognition, and nurturing positive workplace relationships are essential factors in mitigating the occurrence of quiet quitting among teleworkers.

Quiet quitting can have significant consequences for both employees and organizations. Employees who disengage may experience feelings of boredom, frustration, and burnout, leading to a decline in motivation and job satisfaction. This can have adverse effects on their mental and physical well-being, including increased stress and anxiety. For organizations, the consequences of quiet quitting can be even more severe. Disengaged employees are likely to be less productive and may not reach their full potential, resulting in lost revenue, decreased customer satisfaction, and higher turnover rates (Yıldız, 2023). Employee turnover is a costly issue for organizations, leading to reduced productivity, higher recruitment and training expenses, and a negative impact on overall workplace morale.

It is worth noting that the research on this topic is relatively new, and more studies will need to be conducted to further explore the impact of telework on employee engagement and retention.

#### 5. CONCLUSION

The risks of quiet quitting among teleworkers are high, and organizations must take steps to address this issue to retain their employees. These findings highlight the complex nature of telework, with both positive and negative effects. It suggests that organizations need to carefully manage the factors that can lead to teleworkers' mental escape.

## References

- Ahmad, R., Nawaz, M. R., Ishaq, M. I., Khan, M. M., & Ashraf, H. A. (2023). Social exchange theory: Systematic review and future directions. *Frontiers in Psychology, 13*, 1015921. <https://doi.org/10.3389/fpsyg.2022.1015921>
- Anand, A., Doll, J., & Ray, P. (2023). Drowning in silence: a scale development and validation of quiet quitting and quiet firing. *International Journal of Organizational Analysis*. <https://doi.org/10.1108/IJOA-01-2023-3600>
- Athanasiadou, C., & Theriou, G. (2021). Telework: systematic literature review and future research agenda. *Heliyon, 7*(10). <https://doi.org/10.1016/j.heliyon.2021.e08165>
- Bakker, A. B., & Demerouti, E. (2007). The job demands-resources model: State of the art. *Journal of managerial psychology, 22*(3), 309–328. <https://doi.org/10.1108/02683940710733115>
- Bartel, C. A., Wrzesniewski, A., & Wiesenfeld, B. M. (2012). Knowing Where You Stand: Physical Isolation, Perceived Respect, and Organizational Identification Among Virtual Employees. *Organization Science, 23*(3), 743–757. <http://www.jstor.org/stable/23252086>
- Bentley, T. A., Teo, S. T., McLeod, L., Tan, F., Bosua, R., & Gloet, M. (2016). The role of organisational support in teleworker wellbeing: A socio-technical systems approach. *Applied ergonomics, 52*, 207–215. <https://doi.org/10.1016/j.apergo.2015.07.019>
- Caillier, J. G. (2013). Are teleworkers less likely to report leave intentions in the United States federal government than non-teleworkers are? *The American Review of Public Administration, 43*(1), 72–88. <https://doi.org/10.1177/0275074011425084>
- Carpenter, N. C., & Berry, C. M. (2017). Are counterproductive work behavior and withdrawal empirically distinct? A meta-analytic investigation. *Journal of Management, 43*(3), 834–863. <https://doi.org/10.1177/0149206314544743>
- Christian, A. (2022). “Why quitting is nothing new”. Available at: [www.bbc.com/worklife/article/20220825-why-quiet-quitting-is-nothing-new](http://www.bbc.com/worklife/article/20220825-why-quiet-quitting-is-nothing-new). Accessed December 2022.
- Dash, S. S., & Jena, L. K. (2020). Self-deception, emotional neglect and workplace victimization: A conceptual analysis and ideas for research. *International Journal of Workplace Health Management, 13*(1), 81–94. <https://doi.org/10.1108/IJWHM-03-2019-0036>
- Davis, R., & Cates, S. (2013). The Dark Side of Working in a Virtual World: An Investigation of the Relationship between Workplace Isolation and Engagement among Teleworkers. *Journal of Human Resource and Sustainability Studies, 1*, 9–13. DOI: 10.4236/jhrss.2013.12002.
- DiPietro, R. B., Moreo, A., & Cain, L. (2020). Well-being, affective commitment and job satisfaction: influences on turnover intentions in casual dining employees. *Journal of Hospitality Marketing & Management, 29*(2), 139–163. <https://doi.org/10.1080/19368623.2019.1605956>
- Esteveny, L. (2022). *Quiet quitting*, Cern Bulletin, 35-36/2022, 10-11.
- Fonner, K. L., & Roloff, M. E. (2010). Why teleworkers are more satisfied with their jobs than are office-based workers: When less contact is beneficial. *Journal of Applied Communication Research, 38*(4), 336–361. <https://doi.org/10.1080/00909882.2010.513998>
- Harker Martin, B., & MacDonnell, R. (2012). Is telework effective for organizations? A meta-analysis of empirical research on perceptions of telework and organizational outcomes. *Management Research Review, 35*(7), 602–616. <https://doi.org/10.1108/01409171211238820>
- Harter, J. (2022). Is Quiet Quitting Real? Gallup Inc. Available at: <https://www.gallup.com/workplace/398306/quiet-quitting-real.aspx>. Accessed May 2023.
- Jo, Y., & Lee, D. (2022). Activated at home but deactivated at work: How daily mobile work leads to next-day psychological withdrawal behavior. *Journal of Organizational Behavior, 43*(1), 1–16. <https://doi.org/10.1002/job.2563>

- Kelliher, C., & Anderson, D. (2010). Doing more with less? Flexible working practices and the intensification of work. *Human relations*, 63(1), 83–106. <https://doi.org/10.1177/0018726709349199>
- Kelly, J. (2022). Soul-crushing, dead-end jobs are the reason behind the great resignation and quiet quitting trends. *Forbes*. Available at: <https://www.forbes.com/sites/jackkelly/2022/10/25/soulcrushing-dead-end-jobs-are-the-reason-behind-the-great-resignation-and-quiet-quitting-trends/>. Accessed June 2023.
- Kruse, K. (2022). Why half the workforce is quiet quitting, and what to do about it. *Forbes*. Available at: <https://www.forbes.com/sites/kevinkruse/2022/09/15/why-half-the-workforce-is-quiet-quitting-and-what-to-do-about-it/>. Accessed June 2023.
- Mahand, T., & Caldwell, C. (2023). Quiet Quitting—Causes and Opportunities. *Business and Management Researches*, 12(1), 9–18. <https://doi.org/10.5430/bmr.v12n1p9>
- Maruyama, T., & Tietze, S. (2012). From anxiety to assurance: Concerns and outcomes of telework. *Personnel Review*, 41(4), 450–469. <https://doi.org/10.1108/00483481211229375>
- Masterson, V. (2022). What is quiet quitting? Available at: <https://www.weforum.org/agenda/2022/09/tiktok-quiet-quitting-explained/>. Accessed September 2022.
- Masuda, A. D., Holtschlag, C., & Nicklin, J. M. (2017). Why the availability of telecommuting matters: The effects of telecommuting on engagement via goal pursuit. *Career Development International*, 22(2), 200–219. <https://doi.org/10.1108/CDI-05-2016-0064>
- Northouse, P. G. (2019). *Leadership: theory and practice*. Eighth Edition. Los Angeles, SAGE Publications.
- Okyere-Kwakye, E., & Otibu, F. (2016). Organizational Factors and Employees Commitment. *Advances in Social Sciences Research Journal*, 3(5), 62–69. <https://doi.org/10.14738/assrj.35.1930>
- Overbey, J. A. (2013). Telecommuter intent to leave. *Leadership & Organization Development Journal*, 34(7), 680–699. <https://doi.org/10.1108/LODJ-01-2012-0004>
- Princy, K., & Rebeka, E. (2019). Employee Commitment on Organizational Performance. *International Journal of Recent Technology and Engineering (IJRTE)*. 8(3), 891–895. <https://doi.org/10.35940/ijrte.c4078.098319>
- Ryan, R. M., & Deci, E. L. (2022). Self-determination theory. In: Maggino, F. (eds), *Encyclopedia of quality of life and well-being research*. Cham: Springer International Publishing. 1–7. [https://doi.org/10.1007/978-3-319-69909-7\\_2630-2](https://doi.org/10.1007/978-3-319-69909-7_2630-2)
- Sardeshmukh, S. R., Sharma, D., & Golden, T. D. (2012). Impact of telework on exhaustion and job engagement: A job demands and job resources model. *New Technology, Work and Employment*, 27(3), 193–207. <https://doi.org/10.1111/j.1468-005X.2012.00284.x>
- Serenko, A. (2023). (In Press). The human capital management perspective on quiet quitting: recommendations for employees, managers, and national policymakers. *Journal of Knowledge Management*. <https://doi.org/10.1108/JKM-10-2022-0792>
- Snyder, H. (2019). Literature review as a research methodology: An overview and guidelines. *Journal of business research*, 104, 333–339. <https://doi.org/10.1016/j.jbusres.2019.07.039>
- Taskin, L., & Bridoux, F. (2010). Telework: A challenge to knowledge transfer in organizations. *The International Journal of Human Resource Management*, 21(13), 2503–2520. <https://doi.org/10.1080/09585192.2010.516600>
- van Monsjou, E., Struthers, C. W., Fergus, K., & Muise, A. (2023). Examining the lived experience of holding grudges. *Qualitative Psychology*. 10(1), 60–78. <https://doi.org/10.1037/qap0000205>
- Yildiz, S. (2023). Quiet Quitting: Causes, Consequences and Suggestions. *Social mentality and researcher thinkers journal*. 9(70). 3180–3190. DOI: 10.29228/smryj.69426.
- Zenger, J., & Folkman, J. (2022). Quiet Quitting Is About Bad Bosses, Not Bad Employees. Available at: <https://hbr.org/2022/08/quiet-quitting-is-about-bad-bosses-not-bad-employees>. *Harvard Business Review*, Harvard Business Publishing. Accessed May 2023.





# Relationship between Hierarchical Values of Professional Activities and Theoretical and Practical Knowledge

Valentina Vukosavljevic Pavlovic<sup>1</sup>

Received: August 18, 2023

Revised: December 22, 2023

Accepted: January 4, 2024

Published: March 16, 2024

## Keywords:

Professional activities;  
Professional knowledge;  
Managerial structure



Creative Commons Non Commercial CC BY-NC: This article is distributed under the terms of the Creative Commons Attribution-Non-Commercial 4.0 License (<https://creativecommons.org/licenses/by-nc/4.0/>) which permits non-commercial use, reproduction and distribution of the work without further permission.

**Abstract:** *An indispensable aspect that can greatly influence the profile of the managerial structure in enterprises is the educational system. At the end of the last century, under the pressure of the second wave of globalization caused by technological development, there was a need to reexamine and redefine the role of the university. The subject of analysis in this paper is the relationship between the hierarchical values of professional activities and theoretical and practical knowledge from the point of view of managerial structures in private and public enterprises on the example of one unit of local self-government in the Republic of Serbia. Based on the opinion of representatives from the private (1.85) and public sector (1.85) on the scale of hierarchical values of professional activities, the adopted systematic theoretical and practical knowledge were evaluated in the first place. Through the analysis of the responses received from both observed groups, it was found that modern managers are the most open social group for improvement, motivated to acquire new knowledge arising from the need for more effective adaptation to changes.*

## 1. INTRODUCTION

Scientific-technological progress, and the complexity of technological, economic and organizational processes have displaced the class of owners from the process of leadership and the process of management of the company's development. Now management is handled by a special socio-professional group of people, which we call managers. Such changes in the development of corporations are an expression of the law of division of labor, by which modern society realizes the rationalization and modernization of both the production and management systems. In this sense, we can talk about global, strategic and operational management, about highly professional change management at different levels of social organization, including the conditions of globalization of modern society and the transnational planetary level. This approach to management presupposes special education of managerial staff and constant innovation of their knowledge and management skills. If knowledge is the key resource of modern society, then management and managers must, with their own culture, be the most open social group for improvement and change. There are numerous dimensions of their social position. In this sense, they can be analyzed concerning other social groups by differences in the system of distribution of material wealth, by the level of knowledge they possess, which is influenced by the system of hierarchical values of professional activities, by their place in the system of distribution of power and influence, by the level of reputation, lifestyle and their place in the distribution of political power in society.

<sup>1</sup> Academy of Vocational Studies Southern Serbia, Leskovac, Serbia

## **2. THE METHODOLOGICAL FRAMEWORK OF THE PAPER**

The subject of analysis in the paper is the relationship between hierarchical values of professional activities and theoretical and practical knowledge from the point of view of managerial structure in private and public enterprises on the example of one unit of local self-government in the Republic of Serbia. In the set subject framework of the paper, the professionalization of management as a form of modernization of management in companies is considered from the point of view of the managerial structure, where in their value system of professional activities there is theoretical and practical knowledge.

For this paper, 32 companies from the Report of the Agency for Business Registers of the Republic of Serbia, from the territory of one local self-government with the status of a city, were taken into consideration and the data was processed in 2020. The criteria for the stratification of the sample were that the enterprises employ more than 50 workers, that they are engaged in economic activity that is among the most represented at the level of the subject local self-government unit, namely, above all, the food, wood-processing and textile industries. Out of the total number of companies, 28 met the stratification criteria, of that number seven were included in the research and five did not continue cooperation regardless of the submitted material and personal contact. The sample also includes one enterprise that employs the largest number of workers on the territory of the city, even though it is not registered in the official Agency for Business Registers on the territory of the analyzed local government unit. The sample included three entrepreneurial shops and five public and public utility companies so the stratified sample covered 57% of the enterprises that met the stratification requirements. The criterion for the stratification of the sample is the number of enterprises in the status of an economic society and an entrepreneurial agency and a local public and public-utility enterprise. The sample included 15% of small enterprises and 15% of medium-sized enterprises and 100% of public enterprises.

The methodological and technical framework of the paper in the field consists of a questionnaire of 47 open and closed questions, divided by thematic frameworks of the paper, based on the subject of the research work and following the hypothetical framework. In this paper, the answers related to the second group of questions out of a total of five are analyzed to investigate their opinions and attitudes about the professionalization of management in the sense of: what are the professional activities and knowledge that a modern manager should possess and whether there are differences when it comes to the Serbian manager today.

### **2.1. Hypothetical Framework of the Work**

The speed of transitional changes in post-socialist societies, which have found themselves in the process of restoration of the socio-economic capitalist system of various historical forms, from neoconservative to neoliberal, with one segment of the social structure, will depend on the degree and form of professionalization of management in the process of management at the levels of work organizations, which in first of all, it implies their ability to adapt to changes, to acquire new theoretical and practical knowledge and to apply it.

### **2.2. The Aim of the Paper**

The paper aims to analyze the significance and type of relationship between the hierarchical values of professional activities and theoretical and practical knowledge, based on the empirical

research conducted, from the aspect of the great influence of the educational system on the profile of the managerial structure caused by technological development as one of the important and necessary elements for shaping and reproducing professional activities.

### 3. DEFINITION OF PROFESSIONAL ACTIVITY AND PROFESSIONAL KNOWLEDGE TERMS

Professional activity is a kind of combination of universal norms and specific functions. The definitions, that we find today in sociology, mostly follow Parsons' basic understanding of the profession as a normatively universal and functionally specific activity. The most frequently mentioned and at the same time the most criticized is Greenwood's definition of a profession. In his opinion, professional activity is an extremely complex phenomenon in society, which contains the following elements: 1) elements that primarily imply a systemically rounded theory, 2) professional authority, 3) social sanctions, 4) ethical codex, and 5) a specific subculture“ (Greenwood, 1962, pp. 207-218).

According to Greenwood (1962), „Each of the mentioned elements is necessary, although not sufficient for shaping and reproducing professional activity. Only the intertwining of all five elements into a unique structure of behavior enables such a complex of social activity that we label as professional activity“ (pp. 207-218).

Characteristic - the system-rounded theory is the basic and most important element of professional activity because it creates a significantly different work process. The work of professionals is different from the work of craftsmen because it must be innovative, critically oriented, and creative.

Sociologically speaking, the difference between craft activity and professional activity is that the former is focused on continuity, and professional activity on innovation, creativity, and a creative approach. Social dynamics as an environment are not characteristic of craft shops, while professionals are maintained by constant changes, criticism and the introduction of innovations. Theory cannot be replaced by experience, but only supplemented, upgraded and given creative potential, i.e. ennobled. Any compensating of experience with theory is dysfunctional and methodologically wrong and thus represents a danger to the quality of professional activity.

The second mentioned characteristic refers to professional authority. Expert authority derives from a systemically rounded theory: solving any practical problem must be based on the consistent application of theory. We call that expertise. Expertise is nothing more than methodologically consistently applied theory to concrete practical problems and situations. Since expertise has a theoretical and methodological basis understandable only to an expert, in this sense the expert has a monopoly over expertise.

A monopoly over expertise means only a monopoly on a very narrow, specialized professional activity, which enables the full responsibility of the expert. The frameworks of professional monopoly are, therefore, very narrow, although, on the other hand, they are important because any enabling monopoly on expertise means deprofessionalization and the destruction of the principle of complete and exclusive responsibility, which the expert has for his work.

Relations between professional colleagues must not be based on competition but on cooperation. Therefore, advertising or even open competition among experts is a fundamental violation

of professional ethics. This is not about nobility but about the imperative need to protect full cooperation, a full and independent exchange of information, without which the constant development of the profession is impossible.

Experts in relation to users must be neutral based on age, gender, race and social affiliation, or any other form of discrimination. During each service, professionals should invest all their intellectual, professional and moral abilities in solving the problem. Any routinization of work is contrary to the code of ethics.

Most of the definitions of professional activity, which stem from functional structural analysis, are similar to Greenwood's. Barber (1963) for example, believes „that professional activity is possible only when these four elements are present: 1) a high level of vast and systematic knowledge, 2) the predominant orientation of professionals in achieving common interests, 3) a high degree of self-control based on interdependent collegial control of the implementation of the norms of the code of ethics and 4) a system of honorable and financial rewards, which stimulate, first of all, the quality of services and not the profiteering of individuals“ (p. 216).

Barber's definition differs from Greenwood's in that it is somewhat more selective and in that, it emphasizes less autonomy, that is, the authority of professional activity. Newer definitions of professions, which we come across in professional literature - for example, by Krause (1971, pp. 75–79), are quite similar to Greenwood's. They differ from it in that they emphasize less on professional autonomy and monopoly on expertise.

Although traditional definitions of professions still prevail, in recent times, criticisms of such concepts have been appearing more and more often. Based on their direction, these criticisms could be classified into two groups: 1) a group of criticisms that oppose the excessive emphasis on the authority of professional activity and, on the other hand, still emphasize the qualitative differences between professional and other vocational activities, which we find in qualified work in enterprises or in craft work in the service industry and 2) a group of criticisms that warn of the unreality of the above definitions; these criticisms emphasize that Greenwood's definition of the profession is ideotypical and not realistic. What Greenwood defines as a profession is an ideal to which all professions aspire, but only partially reach; warn that professionalization is a long-term process, which in the initial phase gives birth to some quasi-professions, in its later phase to semi-professions and only in the developed phase it gives birth to professional activities, which is more or less similar to Greenwood's ideotype.

Numerous anti-elitist criticisms have appeared only recently. They prevailed at the World Congress of Sociologists in Toronto in 1974 and at the assemblies of the American Sociological Association. According to Rus and Arzenšek (1984), „Gyarmati can be included among the most radical anti-elitist critics of the structural-functionalistic understanding of professional activity (p. 217).“ In his opinion, the properties attributed to the profession are a priori claims and not empirical facts. The properties attributed to professional activity are invented to justify the power possessed by professionals.

Donald Light believes that professional authority is not necessarily a consequence of the theory on which some professional activity is based. The authority of a profession is, above all, the product of a social agreement between the profession and the wider society. Based on that agreement, the profession gets the right to select experts, the right to educate those experts, to design educational

programs, to determine the criteria for candidates' access to professional activity and the right to professional control of that activity. For its part, with this agreement, the profession undertakes to constantly take care of the selfless and high-quality work of its members.

Based on the statement of Mok (1969), who also dealt with the subject of professionalization, work theorists Rus and Arzenšek (1984), conclude "If post-industrial societies are pragmatically oriented, then there will almost certainly be a slowing down of the development of science and an acceleration of the development of techniques that enable the exploitation of science" (p. 225).

Turner says: "It is extremely difficult to define profession-specific characteristics. Based on what can be understood, it seems easier to distinguish between professions than between professional and non-professional titles. On that basis, we should give an impetus to the formation of such an analytical framework that would include all and not only professional occupations".

Pavalko (1971), after Turner considered properties specific to professions, developed an analytical instrument that could measure the degree of professionalization of non-professional and professional occupations.

#### 4. CONCEPTUAL DETERMINATION OF MANAGEMENT

An inseparable part of the consideration of human resources is the very concept of management. Management, according to American social worker and management consultant Mary Parker Follett, is "the ability to get things done through people (Business.com, 2021)".

Management, as a process, consists, according to the majority of authors, of four phases: planning, organizing, leading, and controlling (Janićijević, 2008, p. 3). Managers do not perform jobs and tasks in the organization, but plan, organize, lead, and control how the members of the organization perform these jobs and tasks. Each of these four phases includes the realization of certain goals, which enables the smooth development of the managerial process.

The first phase of the managerial planning process determines the way and activities for achieving the set goals. This, first of all, includes the allocation, i.e. obtaining the resources needed to carry out activities in the course of achieving the goals, then determining the time dynamics for carrying out the planned activities.

Organizing is the second phase of the managerial process and it includes setting up the structure of relationships between individuals and groups in the organization in a way that will ensure that the previously planned general and individual goals are achieved most efficiently and effectively. The structure of the relationships between individuals and groups consists of the division of tasks and work roles that should be performed by determining the authority to perform the tasks and, finally, the grouping of units for the realization of planned activities and their harmonization.

Leadership, as the third phase of the managerial process, primarily means: guiding the energy of the organization's members in the direction of initiation, maintenance and direction towards the performance of activities that achieve the organization's goals.

The fourth phase of the managerial process is control, which determines whether the planned goals have been achieved in the planned manner and on time, that is, within the previously determined

deadline. In the control phase, measures are taken to correct the activities in the organization to achieve the set goals. The control phase makes it possible to detect certain irregularities and deficiencies in the course of the work process on time and thereby creates the possibility to remove or correct them in time.

## **5. AN EXAMPLE STUDY OF THE PROFESSIONALIZATION OF TOP FINNISH INDUSTRIAL MANAGEMENT**

In studying the professionalization of top Finnish industrial management, Susanna Fellman found certain changes in: “owner-manager and paid managers; by increasing the educational level of managers and approaching education for business life. The career paths of managers became more similar, management became permanent employment, managers developed more professional attitudes and there was a shift in power in the day-to-day management of companies. All the changes in the background of the manager's work role were reflected in the process of their increasing professionalization” (Fellman, 2011, p. 27). The change of managers in the direction of professionalization is partly the result of a change from owner-managers to employees who became paid managers and based on ceded management rights by capital owners, but the work portfolio of these two subgroups is slightly different. The changes in the further process of professionalization went in the direction of creating a subgroup, i.e. professional managers, and the managerial profile of the owner and the paid manager became more similar.

Two professional waves were observed. The first occurred at the beginning of the twentieth century, while the second dates back to the 1960s and 1970s. During the first professional wave, there were rapid changes from owner-manager to paid manager and there were also major changes in the educational profiles of both subgroups. Professional education among managers has become important and there is specific knowledge that depends on the economy branch and production technology. This was the era of branch specialists. As a consequence of the second wave of professionalization, the new generation of professional managers was characterized by more generalist competencies.

The professionalization of management is the result of the process of industrialization and transformation of business life in Finland, especially the appearance of bureaucratic, hierarchically large firms. The spurt in Finnish industrialization, dated to the end of the nineteenth century, produced rapid industrial growth. The rapid industrialization, growth in the size of enterprises, and technological development, which began in the late nineteenth century, reflected an increasing number of managers with new competencies and, in particular, managers with technical skills. Moreover, the so-called trial period in industrialization took place in the interwar period. As a consequence of the process of internationalization, it can be concluded that two things have happened: first, managerial education has become important and second, changes in the global community related to the changed characteristics of international career.

## **6. ANALYSIS OF THE RELATIONSHIP BETWEEN HIERARCHICAL PROFESSIONAL ACTIVITIES AND THEORETICAL AND PRACTICAL KNOWLEDGE**

The theoretical basis for the analysis of the relationship between hierarchical professional activities and theoretical and practical knowledge in the field dealing with the term professional manager consists of two criteria: professional activities and professional knowledge. Professional activities include: adopted systemic theoretical and practical knowledge, professional authority - a

monopoly over professional knowledge, social recognition of status and reputation, active member of professional associations and organizations, and adherence to the professional code of ethics. Professional knowledge implies: a non-routine approach in the application of knowledge in solving a professional problem and developing new professional insights, the professional approach has the effect of rationalization of work, productivity, and democracy.

A comparative analysis of the responses of the respondents from both the private and public sectors to order them according to the hierarchical value of professional activities based on the conducted research [Vukosavljević Pavlović \(2020\)](#), the results are as follows: both the representatives of the private sector (1.85) and the public sector (1.62) were rated in the first place - adopted systemic theoretical and practical knowledge, in second place also representatives of both sectors declared in favor of adherence to the professional code 2.00, with the difference that the second place is shared when it comes to the responses of respondents from the public sector with professional authority - monopoly over professional knowledge, in the third place and both groups of respondents, there is social recognition, status and reputation and in the fourth place, an active member of professional associations and organizations“ (p. 220).

The type of knowledge that is most important for professional activity based on the responses of respondents from the private sector based on the results of the conducted research [Vukosavljević Pavlović \(2020\)](#), “in the first place is the development of new professional insights, (39.13%) and in the same percentage (30.43%) the answers share the second place: a non-routine approach in the application of knowledge in solving a professional problem and a professional approach has the effect of rationalization of work, productivity and democracy“ (p. 221).

There are differences in the answers of the respondents from public and public-utility local enterprises in the order of importance so that in the first place with 68.75% is: professional approach has the effect of rationalization of work, productivity and democracy, in the second place, with 18.75 %: non-routine approach in applying knowledge in solving a professional problem, in third place is what is in the first place when questions are answered from the private sector and development of new professional insights (12.50%).

Through a comparative analysis of the answers received from both groups, it can be concluded that they reflect the degree of priority of business activities to achieve business goals, that is successful business. In the private sector, new, fresh ideas, and new products are important, a more innovative, creative approach to the work process is required, which will enable a better market position and competitiveness. In contrast to the organization and business in the public sector, which suffers from problems related to irrationality, inefficiency, the impossibility of independent decision-making by directors and bosses, not market orientation, because the policy maker is in public and public-utility local takeovers and at the same time their financier is the local self-government unit, that is the city, which manages public enterprises through its executive and legislative bodies.

Comparative answers of respondents from private and public and public-utility companies to the question: Circle those characteristics, which you think describe the modern manager as a social group ([Vukosavljević Pavlović, 2020, p. 221](#)) given as follows. Respondents of both groups (private sector and public sector) believe that modern managers are the most open social group for improvement, motivation and changes (private - 45.45% and public - 37.50%). They believe that their characteristic is a specific cultural professional style (private - 20.83% and public - 18.18%). Based

on the percentage share of 16.67%, respondents from the private sector believe that their social position is characterized by a high place in the distribution of material wealth, and in the public sector, with 18.18% each, the third place was taken by two characteristics: a high degree of reputation in society and a specific professional style. The characteristic High place on the social ladder in the system of distribution of power and influence was ranked fourth in almost the same percentage (9%) for both groups. Many answers refer to the characteristics defined by the respondents themselves, considering that managers create profits as long as their interests are at stake, but they do not have a social reputation, they need others to perceive them as persons with a high reputation in society and the need to be influential and outside of his professional activities.

The advantage of the prevailing attitude, based on the responses from both observed groups, is that modern managers are the most open social group for improvement, motivation and changes towards new, more efficient models of people management.

## 7. CONCLUSION

In order to reveal the prerequisites, basic obstacles and limitations to the professionalization of management in work organizations, the set-theoretical basis consists of two criteria: professional activities and the type of knowledge of the professional occupation, with special emphasis on the ability of creative, innovative, originative approach of managers in management as a new modality in the concept of professionalization management in Serbian companies. There are different needs and consequences arising from the ownership relationship, in the process of professionalization at work, and thus a different degree of importance is given to certain professional activities and the type of knowledge of professional occupations. In the private sector, professionalism in business is primarily seen in adherence to the professional code of ethics, and in the first place in the public sector, a professional approach has the effect of rationalizing work, productivity and democracy and, to a significantly smaller percentage, that it is a professional activity that should be adhered to professional code of ethics.

Confirmation of different priorities in the understanding of professionalization at work in the public and private sectors is in the declaration of the type of knowledge of professional occupations. In the private sector, the development of new professional insights is in the first place, and the second place is shared by: a non-routine approach to the application of knowledge in solving a professional problem and a professional approach as a rationalization of work, productivity and democracy. In the public sector, when it comes to the type of knowledge of professional occupations, the first place is the answer: the professional approach has the efficiency of rationalization of work, productivity and democracy, in the second place is the non-routine problem approach, in third place is what is in the first place when questions are answered from the private sector - development of new professional insights. There is some agreement in the private and public sectors in the attitude when it comes to the qualities of a good manager, which exists in real life, namely: responsibility, creativity, originality, innovation, quick action and creative attitude. In the theoretical-methodological part of the work, the aforementioned features are taken as the basis for defining changes in the professional approach of managers.

By harmonizing the attitudes and opinions about the qualities of an ideal, realistic and Serbian manager, it can be concluded that qualities such as communicativeness and expertise are common to all three categories of managers, with the difference that the Serbian manager still behaves in the spirit of a traditional manager who relies to a greater extent on professional



education and calculative, rational intelligence, in contrast to idealized managers and those who are seen as successful in real business, who possess, apart from professional education, calculative, rational intelligence (here the term rational is used in its meaning - to calculate) and creativity, originality and innovation and ethical orientation.

After analyzing the results of the research related to the characteristics that a successful manager should have, a leader in a company (in order of importance) a similarity is observed in the responses of respondents from the public and private sectors, comparing them with the responses that related to a successful manager in real circumstances. There is only a difference in the order of priority. In the first case, responsibility and expertise have switched places, i.e. expertise is the most dominant trait when it comes to a successful ideal manager, and in the second place when describing a successful manager from real life. Communicativeness as an important trait is also somewhere in the middle in both corpuses of answers. Innovativeness is highly rated as a trait that is appreciated by managers in practice, and an idealized sense, this trait is indicated in the fourth place.

The personal qualities of a successful Serbian manager are evaluated differently in the responses from the private and public sectors. Authoritativeness, coping with given situations and communication are the first personal qualities of a Serbian manager, based on the testimony of respondents from the private sector, and the second place is empathy and compassion, that he is brave but at the same time egocentric. When comparing the answers with the statements from the public sector, they primarily refer to the ability to act quickly; in changing market conditions, resourcefulness in new and unknown situations, expertise, and communicativeness. A certain similarity was observed in the answers from both sectors and it refers to quick and resourceful action in changing market conditions and unknown situations.

And finally, an indispensable aspect that can greatly influence the profile of the managerial structure in enterprises is the educational system. In which direction one part of the educational system in the world is going, can be analyzed based on Derek Bock's text "University on the Market", published in 2005 (Bock, 2005). It started with the commercialization of sports activities, which initially acted as an excellent additional income for the university, but later proved to be a great burden that threatened, and to some extent succeeded, to negatively affect the quality of studies. The analysis of the author of this book shows that any non-university activity will necessarily require increasing investments in its development and that the realized profit will not be able to be used to improve the basic mission of the university.


Regarding the commercialization of universities, there are many opportunities and even more problems. Perhaps it is a good reason to open a serious discussion in Serbia about the quality of studies, about the agreed market need for certain professional profiles, including new theoretical achievements about factors influencing the theory of social sciences and management. In the last two centuries, the university, which exists today, found itself in the role of creator and guardian of national values. With the establishment of national states, European universities grew into state institutions, where the foundations of national sciences are laid, national ideology is promoted, and the experts needed by such a state are formed. Thus, a kind of coexistence was established, within which the university accepts the assigned role, but retains its autonomy and inviolability in everything else. At the end of the last century, under the pressure of the second wave of globalization caused by technological development, there was a need to reexamine and redefine the role of the university.

## References

- Barber, B. (1963). „Some Problems in the Sociology of the Professions“, *Deadalus*, 92, 4.
- Bock, D. (2005). *Univerzitet na tržištu*, Beograd: CLIO.
- Business.com. (2021). <https://www.business.com/articles/management-theory-of-mary-parker-follett/>
- Fellman, S. (2011). The professionalisation of management in Finland:: The Case of the Manufacturing Sector, 1900-19751. *Scandinavian Economic History Review*, 49(3), 5-27. <https://doi.org/10.1080/03585522.2001.10419850>
- Greenwood, E. (1962). Attributes of Profession, pp. 207-218; in book Nosow & Rorm: *Man, Work and Society*, New York, Books.
- Janićijević, N. (2008). *Organizaciono ponašanje*, Beograd: Data Status.
- Krause, E. (1971). *The Sociology of Occupations*, Little, Brown, Boston, pp. 75 -79.
- Mok, A. L. (1969). Alte und neue Professionen. *Kölner Zeitschrift für Sociologie und Socialpsychologie*, Vol. 21, 770-781.
- Pavalko, R. (1971). *Sociology of Occupation and Professions*, Peacock, Ithaca.
- Rus, V., & Arzenšek, V. (1984). *Rad kao sudbina i kao sloboda*, Zagreb: Sveučilišna naklada Liber.
- Vukosavljević Pavlović, V. (2020). *Socio-ekonomski aspekti profesionalizacije menadžmenta kao oblik modernizacije sistema upravljanja u preduzećima na primeru grada Leskovca* [Doctoral dissertation, Filozofski fakultet, Univerzitet u Prištini sa privremenim sedištem u Kosovskoj Mitrovici].



# Financial Market Knowledge of the Young Generation: An Empirical Analysis of European Students\*

Dominika P. Gałkiewicz<sup>1</sup>   
Mario Situm<sup>2</sup>   
Lukas Hartleif<sup>3</sup> 

Received: June 20, 2023  
Revised: January 17, 2024  
Accepted: January 22, 2024  
Published: March 16, 2024

## Keywords:

Financial literacy;  
Literacy;  
Knowledge;  
Instruments;  
Financial markets;  
Survey



Creative Commons Non Commercial CC BY-NC: This article is distributed under the terms of the Creative Commons Attribution-Non-Commercial 4.0 License (<https://creativecommons.org/licenses/by-nc/4.0/>) which permits non-commercial use, reproduction and distribution of the work without further permission.

**Abstract:** *In the recent survey of 262 European students, we try to assess the level of financial market knowledge of the young generation around the age of 23 years. We can identify the following highlights in the first out of three parts: 54.3% out of 256 people, who answered the question, purchased at least once shares, bonds, mutual funds or made comparable investments in the past and the experience made by 179 out of 262 (68.3%) people was perceived to be very positive. Similarly, the attitude of 230 out of 262 (87.8%) European students towards buying shares, bonds, mutual funds, or making comparable investments is very positive. However, the attitude of 247 and 249 people out of 262 attendees, respectively, towards the general economic situation driven by inflation and the observable increase in prices of everyday goods are rated rather low. In the main part of our survey, we analyze the level of competence of our European students to deal with calculus-related exercises (e.g. impact of the time value of money, interest or/and inflation, functioning of financial markets and instruments). We observe the following tendencies: 86.3% of people correctly stated that investments in shares offer the highest risk, which shows that European students understand the basic finance relationship between higher risk potentially leading to high returns or high losses. 82.8% of participants correctly stated that the possibility of losing money decreases with a higher degree of diversification. The third set of questions focuses on the knowledge related to investment possibilities and potential preferences for investments. For example, 45.4% of people signaled their willingness to invest their money into real estate investment funds, 43.9% chose shares, 28.2% mentioned ETFs, 20.2% would decide on bonds and 11.8% for cryptocurrencies. European students seem to be financially knowledgeable on an average level and the majority can choose instruments that fit their preferences.*

## 1. INTRODUCTION

A high level of financial knowledge is relevant in today's world in various life-related situations, because the world has become much more complex than it was 20 years ago. Especially, in times of low interest rates (or high inflation phases) bank account interest rates are low and do not allow one to save money for an own home (e.g. house or flat) or future pension time, etc. In addition, there are still not too many studies analyzing the level of financial literacy in the EU. A wide range of studies documents the relevance of financial literacy in society because it can achieve financial well-being (Bae et al., 2023; Bongini & Zia, 2018; Finke & Huston, 2014) and contribute to the soundness and efficiency of the financial system (Widdowson & Hailwood, 2007). However,

\* We thank for additional funding as this study was supported by funds from the Province of Tyrol (TWF Austria).

<sup>1</sup> University of Applied Sciences Kufstein Tirol, Finance, Accounting & Auditing, Andreas Hofer-Str. 7, 6330 Kufstein, Austria

<sup>2</sup> University of Applied Sciences Kufstein Tirol, Entrepreneurship and Financial Management, Andreas Hofer-Str. 7, 6330 Kufstein, Austria

<sup>3</sup> University of Applied Sciences Kufstein Tirol, Entrepreneurship and Financial Management, Andreas Hofer-Str. 7, 6330 Kufstein, Austria

the reality evaluated by research shows that there is a deficit in financial literacy worldwide (e.g. [Abreu & Mendes, 2010](#); [Beal & Delpachitra, 2003](#); [Lusardi & Mitchell, 2011](#)) with mainly women having significantly lower financial literacy than men ([Dewi, 2022](#); [Erner et al., 2016](#)). Hence, there is still a need for sufficient exploration in academia to answer open questions in this research field.

This study analyzes the status quo of the level of financial literacy through a survey conducted among 262 Austrian and German students (from Generations Y & Z) to find out what experience and knowledge they have of selected capital market products. For example, the literature shows a "gender gap" in knowledge with men having a higher general financial knowledge ([Arellano et al., 2018](#); [Bianchi, 2018](#); [Gerrans & Heaney, 2019](#)). Nevertheless, research shows that deficits in this area and general within society should be counteracted within the framework of higher education ([Bae et al., 2023](#); [Bucher-Koenen et al., 2017](#)). There are essentially hardly any differences in knowledge between the Y and Z generations, so it cannot be directly deduced that financial literacy increases with age. Given the changes in the economic environment and the lack of knowledge about certain capital market products, it seems relevant to integrate financial knowledge into curricula. The majority of empirical studies confirm that this is the greatest lever for increasing financial literacy ([Baglioni et al., 2018](#); [Bianchi, 2018](#); [Ergün, 2018](#)) and also for closing the gender gap ([Bae et al., 2023](#)). Thus, with proper didactic implementation, not only content, but also the development of skills in general (e.g. savings behavior, retirement planning, etc.), and for the acquisition and processing of relevant information ([Santini et al., 2019](#); [Warmath & Zimmermann, 2019](#)) can be taught. In the end, students should be able to make sound financial decisions after completing the content ([Lusardi, 2019](#)). Thus, our analysis aims to promote the implementation of best practices developed for education into curricula to strengthen the financial background of the students and the whole society.

In the following, section 2 provides the background on financial literacy literature, while the next section 3 describes the data. The discussion of the methodological approach and empirical results follows in section 4, while section 5 concludes the paper.

## 2. BACKGROUND ON FINANCIAL LITERACY

The relevance of financial literacy for society's well-being and the efficiency of the financial system was shown by previous literature ([Bae et al., 2023](#); [Bongini & Zia, 2018](#); [Finke & Huston, 2014](#); [Widdowson & Hailwood, 2007](#)). There are still deficits observable worldwide, e.g. [Abreu and Mendes \(2010\)](#), [Beal and Delpachitra \(2003\)](#), and [Lusardi and Mitchell \(2011\)](#), that need to be addressed by further research. For example, there is no one definition of financial literacy in the literature ([Finke & Huston, 2014](#)) and we still lack good measures of the level of financial literacy as suggested by [Knoll and Houts \(2012\)](#). Usually, a higher level of financial literacy is comparable to more financial knowledge enabling the actors to make better financial decisions ([Farrell, 2014](#); [Warmath & Zimmermann, 2019](#)). Several studies show that people with a higher level of financial knowledge are more aware of the necessity to save money for the future/pension time and save more (e.g. [Lusardi & Mitchell, 2011](#); [Bucher-Koenen et al., 2017](#)). This is according to [Baglioni et al. \(2018\)](#) especially important for longer-living women who need to fix a longer „financial-wellbeing“-period. This group of financially knowledgeable people can also better deal with their debt, e.g. interest payments, down payments, future payments, and reducing leverage ([Breitbach & Walstad, 2016](#); [Fung & Durand, 2014](#); [Lusardi, 2019](#)). Moreover, [Xiao et al. \(2014\)](#) show that the basis for better behavior can be laid down during study time as knowledgeable students are more risk-averse when dealing with debt-related issues.

Furthermore, one can say that financially knowledgeable people are better able to search for mutual fund investments based on fundamental analysis. They also can better diversify their savings to minimize risks and obtain higher returns (e. g. Bucher-Koenen et al., 2017). Through this channel, a higher level of financial literacy impacts the resilience and efficiency of the financial system. Those knowledgeable people make better financial and investment decisions, recognize the relationship between risk and return, and generally ask more questions concerning financial products (Widdowson & Hailwood, 2007).

### 3. DATA

In the recent survey of 262 European students, we try to assess the level of financial market knowledge of the young generation. In particular, we investigate the students' background and basic financial experience, their understanding of interest effects, inflation, and diversification besides the knowledge of and interest in various investment alternatives (students' preferences).

Out of 262 Austrian and German interviewed students 60.7% were women, 38.2% were men and 0.4% were diverse people with a median age of 23. In addition, 38.9% of attendees have obtained an A-level from a business college type of school, while 47.0% have an A-level degree from a general focus college. An apprenticeship was finished by 12.2% of the participants and 25.2% stated to have finished a Bachelor in Business, while 14.5% chose any other type of education. A fraction of 65.7% of participants states to study and 27.9% of the interviewees are employed by someone, while a small group of 3.8% of attendees is self-employed (the remaining categories are with 1.2% apprenticeship, 0.4% school, and 0.8% others). Only 17.6% of people have a leadership position there, which is traceable given the young age of all attendees, but 41.6% have some rights to make decisions in the firms they are working for.

### 4. RESULTS AND METHODOLOGICAL APPROACH

In the first part of the survey, questions regarding the experience with trading shares and the attitude towards that were asked. Interestingly, 54.3% out of 256 people, who answered the question, purchased at least once shares, bonds, mutual funds or made comparable investments in the past and the experience made by 179 people was perceived to be very positive and scaled 5 in mean and median on a 7-points Likert scale. Similarly, the attitude of 230 European students towards buying shares, bonds, mutual funds, or making comparable investments is very positive and scaled 5 in mean and median on a 7-point Likert scale. In contrast, the attitudes of 247 and 249 people out of 262 attendees, respectively, towards the general economic situation driven by inflation and the observable increase in prices of everyday goods are rated 3 and 2, respectively on a 7-point Likert scale, which is rather low. The wealth situation of the attendees is the following: 33% of them earn less than 500 EUR net, 30% between 500 and 1500 EUR net, and 34% more than 1500 EUR net (where 3% did not respond to this question).

In the main part of our survey, we analyze the level of competence of our European students to deal with calculus-related exercises. Particularly interesting is how survey participants can deal with the time value of money and whether they understand bank account development in the presence of low-interest rates and high-inflation environments. Question 1 in the main part asked: "How much money was in a bank account after 5 years, if 100 EUR were initially invested and 2% p.a. were promised?" 91.6% of people correctly stated that this would be more than 102 EUR. Question 2 asked: "How much money was in a bank account after 5 years if 100 EUR

were initially invested and 20% p.a. were promised (future value)?" 70.6% of people correctly stated that this would be more than 200 EUR. Question 3 asked: "How much money was in a bank account after one year if 100 EUR were initially invested and 1% p.a. are promised, while the inflation rate equals 2% per year (inflation)?" and 90.5% people correctly stated that this will be less than today. Question 4 asked: "Imagine that your friend is inheriting 10,000 EUR and a brother of him is inheriting 3 years later a similar amount of money – who gets richer (time value of money)?" and 69.5% of people correctly stated that this will be the friend. Question 5 asked: "Imagine that your income in 2025 doubles and the prices for goods are also two times higher – how much can you purchase with your income?" and 79.0% of people correctly stated that this will be equally as much as today.

Next, we analyze the level of competence of our European students to deal with financial markets and instrument-related questions. Question 6 asked: "What is the major task of the equity market?" and 87.4% of people correctly stated that this will be matching demand with supply for shares. Question 7 asked: "Which statement is correct – if someone purchases shares of company B on the financial market, she or he is?" and 84.4% of attendees correctly stated that they are then partial owners of firm B. Question 8 asked: "Which statement is correct?" and 78.6% of participants correctly stated that mutual funds may invest in various asset classes, i.e. equities and bonds. Question 9 asked: "Which statement is correct – if someone purchases bonds of a company?" and 68.7% of participants correctly stated that she or he is lending money to the firm. Question 10 asked: "Which investments, e.g. bank deposits, bonds, or shares, provide the highest return over 10 or 20 years (investment horizon)?" and 50.0% of attendees correctly stated that shares potentially offer the highest returns (another 28.2% chose bonds). Question 11 asked: "Which investments, e.g. bank deposits, bonds, or shares, show the highest volatility over time?" 86.3% of people correctly stated that investments into shares offer the highest risk, which shows that European students understand the basic finance relationship between higher risk potentially leading to high returns or high losses. Nowadays, in times of fake news and fake labeling applied to investments (e.g. sustainability-related, if a particular firm is not engaged in a brown industry it is often perceived to be sustainable), it is essential to understand that there is no upside potential without facing additional risk. Question 12 finally asked: "What effect on the risk of losing money can be expected once a person simultaneously invests money into different asset classes?" 82.8% of participants correctly stated that the possibility of losing money decreases, which implies that they understand the concept of Markowitz's diversification theory/effect (Markowitz, 1952).

What follows are more detailed questions regarding the functioning of various financial instruments. Question 13 asked: "When you buy a 10-year bond, then you cannot sell this bond without suffering from financial penalties?" 37.0% of attendees stated that they did not know, 29.0% said yes, and 32.4% no. It depends on the bond contract type (indenture) and whether a particular bond is being traded on the market versus being privately held (if traded, the price for the bond may be higher and no suffering would occur). Thus, the answer "do not know" was the best choice under the given circumstances. Question 14 stated: "Shares are usually riskier than bonds." 72.5% of participants correctly said yes, 13.7% responded no and 11.8% stated that they do not know the answer. Question 15 asked: "Purchasing a share usually offers a more certain return than an investment into an equity mutual fund?" and 72.1% of participants correctly said no, 8.0% responded yes and 18.3% stated that they did not know the answer. This further confirms that survey participants understand the concept of diversification very well. The last question 16 in this part asked: "When interest rates fall – what happens to the bond prices?" 42.8% of participants correctly said that bond prices rise versus 22.5% who chose falling bond prices,

while 27.1% stated that they did not know the answer (6.5% had the opinion that bond prices remain stable). Hence, the knowledge about the relationship between bond prices and interest rates is in the case of more than 50% of the survey participants limited.

The third and final set of questions focuses on the knowledge related to investment possibilities and potential preferences for investments. Question 1 asked: “Which of the following financial instruments/investments – shares, bonds, real estate funds, Exchange Traded Funds (ETFs), and cryptocurrencies – do you know?” and 90.8% of attendees know shares, 59.5% of bonds, 69.5% real estate funds, 45.4% ETFs and 75.2% cryptocurrencies. In contrast, question 2 asked: “Imagine you have to invest 10000 EUR – in which asset categories would you invest your money most probably?” and 45.4% of people signalized their willingness to invest their money into real estate investment funds, 43.9% chose shares, 28.2% mentioned ETFs, 20.2% would decide for bonds and 11.8% for cryptocurrencies. This is a striking result as the performance of real estate funds was rather bad in the past, but this is the product, for which bankers get the highest fees. In case a medium-risk alternative is looked for, the ETFs would provide the highest return, e.g. the ETF on the S&P index offered on average a return of ca. 10% p.a. in the last thirty years. As high-risk alternatives individual shares and cryptocurrencies would be perceived where the upside potential is theoretically infinite and the probability to lose the fully invested amount the highest.

In sum, the majority of the survey participants have an average understanding of various financial instruments and can make investment choices that fit their preferences. Overall, the level of financial literacy of the majority of the young generation ranges between average and good, which is an optimistic sign. Educational programs should further strengthen this result in the future through regularly updated curricula that describe in detail the functioning of financial markets and a broad range of financial instruments including the newest on the market.

## 5. CONCLUSION

This study aims to show the level of financial market knowledge of the young generation after evaluating the results of a recent survey from 2023 under 262 European students. Generally, the answers to calculus-related questions were oftentimes in more than 70% of the cases correct further implying an average to a good level of financial competence of the survey participants. Some deficits in financial literacy could be observed when more detailed questions were asked about the functioning of individual financial instruments like bonds. European students seem to be financially knowledgeable and can choose instruments that fit their preferences quite well. More focus should be put in the future on analyzing the performance of various financial instruments like mutual funds and ETFs to bring some of them more into the public focus or the other way around.

The rather optimistic results of the study are relevant for creating adequate educational programs at the university level or science-oriented institutions, for employers and politicians. Further research should focus on surveying large groups of students from other European countries than Austria and Germany to obtain a broad range of representative results.

### Acknowledgment

Supported by funds from the Province of Tyrol (TWF Austria).

## References

- Abreu, M., & Mendes, V. (2010). Financial literacy and portfolio diversification. *Quantitative Finance*, 10(5), 515-528.
- Arellano, A., Cámara, N., & Tuesta, D. (2018). Explaining the gender gap in financial literacy: The role of non-cognitive skills. *Economic Notes: Review of Banking, Finance and Monetary Economics*, 47(2/3), 495-517.
- Bae, K., Jang, G.-Y., Kang, H.-G., & Tan, P. (2023). Early financial education, financial literacy, and gender equity in finance. *Asia-Pacific Journal of Financial Studies*, 51(3), 372-400.
- Baglioni, A., Colombo, L., & Piccirilli, G. (2018). On the anatomy of financial literacy in Italy. *Economic Notes: Review of Banking, Finance and Monetary Economics*, 47(2/3), 245-303.
- Beal, D. J., & Delpachitra, S. B. (2003). Financial literacy among Australian university students. *Economic Papers*, 22(1), 65-78.
- Bianchi, M. (2018). Financial literacy and portfolio dynamics. *The Journal of Finance*, 73(2), 831-859.
- Bongini, P., & Zia, B. (2018). Introduction: The financial literacy collective. *Economic Notes: Review of Banking, Finance and Monetary Economics*, 47(2/3), 235-243.
- Breitbach, E., & Walstad, W. B. (2016). Financial Literacy and Financial Behavior among Young Adults in the United States, Economic Competence and Financial Literacy of Young Adults. <https://doi.org/10.2307/j.ctvbkk29d.7>
- Bucher-Koenen, T., Lusardi, A., Alessie, R., & van Rooij, M. (2017). How financially literate are women? An overview and new insights. *The Journal of Consumer Affairs*, 51(2), 255-283.
- Dewi, V. I. (2022). How do demographic and socioeconomic factors affect financial literacy and its variables? *Cogent Business & Management*, 9(1), 2077640.
- Ergün, K. (2018). Financial literacy among university students: A study in eight European countries. *International Journal of Consumer Studies*, 42(1), 2-15.
- Erner, C., Goedde-Menke, M., & Oberste, M. (2016). Financial literacy of high school students: Evidence from Germany. *The Journal of Economic Education*, 47(2), 95-105.
- Farrell, J. (2014). Demographic and socioeconomic factors of investors. In K. H. Baker & V. Ricciardi (Eds.), *Investor behavior: The psychology of financial planning and investing* (pp. 117-134). New Jersey: John Wiley & Sons, Inc.
- Finke, M. S., & Huston, S. J. (2014). Financial literacy and education. In K. H. Baker & V. Ricciardi (Eds.), *Investor behavior: The psychology of financial planning and investing* (pp. 65-98). New Jersey: John Wiley & Sons, Inc.
- Fung, L., & Durand, R. B. (2014). Personality traits. In K. H. Baker & V. Ricciardi (Eds.), *Investor behavior: The psychology of financial planning and investing* (pp. 99-116). New Jersey: John Wiley & Sons, Inc.
- Gerrans, P., & Heaney, R. (2019). The impact of undergraduate personal finance education on individual financial literacy, attitudes, and intentions. *Accounting and Finance*, 59(1), 177-217.
- Knoll, M. A. Z., & Houts, C. R. (2012). The Financial Knowledge Scale: An Application of Item Response Theory to the Assessment of Financial Literacy. *The Journal of Consumer Affairs*, 46 (3), 381-410. <https://doi.org/10.1111/j.1745-6606.2012.01241.x>
- Lusardi, A. (2019). Financial literacy and the need for financial education: Evidence and implications. *Swiss Journal of Economics and Statistics*, 155(1), 1-8.
- Lusardi, A., & Mitchell, O. S. (2011). Financial literacy around the world: An overview. *Journal of Pension Economics & Finance*, 10(4), 497-508.
- Markowitz, H. M. (1952). Portfolio Selection. *Journal of Finance*, 7, 77-91.



- Santini, F. D. O., Ladeira, W. J., Mette, F. M. B., & Ponchio, M. C. (2019). The antecedents and consequences of financial literacy: A meta-analysis. *International Journal of Bank Marketing*, 37(6), 1462-1479.
- Warmath, D., & Zimmermann, D. (2019). Financial literacy as more than knowledge: The development of a formative scale through the lens of Bloom's domains of knowledge. *The Journal of Consumer Affairs*, 53(4), 1602-1629.
- Widdowson, D., & Hailwood, K. (2007). Financial literacy and its role in promoting a sound financial system. *Reserve Bank of New Zealand Bulletin*, 70(2), 37-47.
- Xiao, J. J., Young Ahn, S., Serido, J., & Shim, S. (2014). Earlier financial literacy and later financial behaviour of college students. *International Journal of Consumer Studies*, 38(6), 593-601. <https://doi.org/10.1111/ijcs.12122>





# Contradictions of Sustainability Teaching Accounting in Higher Education in Bulgaria

Kalin Kalev<sup>1</sup> 

Received: August 21, 2023

Revised: January 19, 2024

Accepted: January 22, 2024

Published: March 16, 2024

## Keywords:

Sustainability;  
Accounting;  
Teaching;  
Self-reinforced;  
Soft skills



Creative Commons Non Commercial CC BY-NC: This article is distributed under the terms of the Creative Commons Attribution-Non-Commercial 4.0 License (<https://creativecommons.org/licenses/by-nc/4.0/>) which permits non-commercial use, reproduction and distribution of the work without further permission.

**Abstract:** *The paper outlines contradictions of "sustainability teaching accounting" in which word game (shown in inverted commas) represents the focal role of the teacher. The problems of the Bulgarian education system are already known - increasing complexity and interconnectedness as results of the breakdown of the value system of society - but not unique. Merely, institutional sustainability discourse is reductionist and mechanistic. And one of the problems of sustainable education is how to empower students with self-reinforcing practice. Attitudes of students of accounting teaching in IU-Varna are presented to justify current teaching in accounting courses. Some generalized proposals are introduced because as greater the students are exposed to sustainable thinking and innovative technologies, better critical thinking and self-reinforced behavior will be articulated.*

## 1. INTRODUCTION

The way to Europeanization or "to do as in the West" forms a technocratic educational system in Bulgaria. The economic perspective of educational transformations is visible.

Quitting to quote the results of the state-wide matriculation exams or other facts for the Bulgarian education system ([Education and Training Monitor, 2020](#)), there are signs of modernism and educational transformations. Not surprisingly, state exam results are a consequence of cultural and social changes that are too reductionist and mechanistic. The problem is the gap between the paradigmatic state of education and the increasing complexity, interconnectedness and breakdown of the value system of society and the world at large. Moreover, marginalization of knowledge shows as a phenomenon in higher education i.e., episodic and non-integrated, criterion-referenced learning that educational institutions require from learners, but which, however, fulfills a limited functional utility beyond the institutional level. Simply, graduates enter the labor market with knowledge unnecessary for practice and business.

That national and institutional status quo led to rigidity of thinking, overlooked ethical values, and disgrace of higher education. Graduation from university is associated with the reception of a diploma for the degree to find a job and a fair share of students often work while studying. The power of knowledge is not understood and we miss already that learning is "learning to learn" ([Lima Filho & Casa Nova 2019, p. 236](#)). Accounting is an important major in Bulgarian economic universities. But in the course probably most students are not aware of their learning and at some stage of 4 years of bachelor's degree they comprehend that they do not want to study this major. The overall situation induces universities to invest in marketing approaches.

<sup>1</sup> University of Economics – Varna, Finance and Accounting Faculty, 77 Knyaz Boris Blvd., 9002, Varna, Bulgaria

The purpose of the paper is to mark some contradictions of accounting education in Bulgaria in the context of sustainability thinking.

The paper is based on legitimacy and institutional theory which framework the “sustainability” in accounting education at IU-Varna.

## 2. THE PROBLEM OF SUSTAINABLE EDUCATION

The concept of sustainability was known for decades before it became popular with the publication of the Brundtland Report in 1986. There are more than 70 definitions, so as [Amaral et al. \(2020\)](#) noticed “it is useless to attempt to come out with a correct and single definition” (p.156). The objectivity of the definition is hard to obtain.

In accordance with Agenda 2030 of UNESCO education is recognized as a fundamental and universal paradigm for transformation and development of sustainability in all main aspects. The newly expressed vision is captured by the proposed SDG4 “Ensure inclusive and equitable quality education and promote life-long learning opportunities for all”. However, [Delors \(1996\)](#) pioneered education as a key factor for moving towards sustainability.

“A sustainable society is one that can persist over generations, one that is far-seeing enough, flexible enough, and wise enough not to undermine either its physical or social systems of support.” “The sustainability transition is the process of coming to terms with sustainability in all its deeply rich ecological, social, ethical and economic dimensions...it is about new ways of knowing, of being differently human in a threatened but cooperating world...” ([O’Riordan & Voisey, 1998, p. 34](#)).

As such promulgated sustainability to education is expected to introduce sustainability in other social spheres - health, finances, quality of life – enhancing people's social returns. The idea was informed long ago by [Dewey \(1916\)](#).

The overarching principle for all forms of education reform cherishes the idea that modest changes may produce big social returns for citizens’ health, finances, opportunities and quality of life ([Dewey, 1916](#)). In the institutional context, the university has to “lead by example” resulting in educated people who are equipped with competencies - knowledge, skills, and ethics - to cope with social, economic, and environmental challenges in the present and the future. So young people, not only students, can bridge the concept of sustainability to reality. They can reproduce respective knowledge and receive instructions in all courses into real-life behavior and related activities to minimize negative effects on the environment, economy, and society. In all matters, on one hand, students play a dual role – custodians and builders of sustainable societies ([Pilloti & Al Ghazo, 2020](#)). However, on the other, sustainability presupposes some societal and policy agenda. So, educational institutions emerged as cornerstones for “the first line of attack” to address the ecological and social challenges that humanity faces from now on. Every sustainability agenda relies on mere institutional sustainability discourse that is reductionist and mechanistic because each university can only translate government (management) sustainable strategies into curriculum changes and academic programs solely to serve the objectives of the upper government body.

### 3. SUSTAINABLE ACCOUNTING EDUCATION

Solving problems and critical thinking are major skills that guide mental operations. Those are widely recognized characteristics for the promotion of sustainability (Van den Branden, 2012). Accounting in terms of sustainability should not be overseen in traditional practices i.e., identification of assets and liabilities, compilation of reports including integrated reports, and many more. Traditional thinking in accounting programs can produce robust effects on ecology, society, and the economy. At present, accounting courses in universities in Bulgaria encourage mostly the application of conventional accounting techniques. But this only translates business transactions into encrypted and universal business language, acceptable to a few societal groups – investor groups, government agencies, and business entity stakeholders (Deegan, 2019). Double-entry booking keeping has to be studied as an undeniable source of effective instruments for the re-distribution of resources. According to Sharma and Stewart (2021, p. 630), sustainability has to be incorporated into the existing accounting courses rather than stand-alone classes as a way to integrate sustainability in accounting instead of ... sustainability as an add-on or supplementary practice (Sharma and Stewart, 2021). Bebbington and Thomson (2001) called it a “hidden curriculum”, a phenomenon hard to investigate and criticize as professed by individual lectures in different ways. And there is doubt in its reasonableness. Accounting teachers should express broadly the environmental, economic, and societal effects of business transactions – tangential sustainability to traditional *modus operandi* Dt / Ct.

Undoubtedly one main venue of accounting courses has to be excellence in rough professional skills. But to train and develop soft skills students need self-reinforcing accounting practice.

The self-reinforcement is a needed attribute for the motivation of students and their learning strategies in accounting courses. Standardized records of business transactions have to be taught in combination with identified accounting principles. This requires strict attention to detail and a clear understanding of the business transaction. Easily students get confused and lose focus. Logical apprehension of accounting principles and concepts and their proper application often seems an overwhelming task. Theoretically, self-reinforcement accounting practice can be described as a method of self-conditioning that leads to strengthening the association between particular stimuli and particular responses (Wolters, 2003). As social acts, studying and practicing accounting can embrace a chain of stimuli for each student. However, the starting point is the teacher with expertise in sustainability concepts and a good understanding of basic accounting theory. Because self-reinforcement can be triggered by him, his accounting examples, and analyzed tasks, case studies, and other methods (Panja, 2018). Then the student as an observer can be reinforced to copy / to accept that behavior. Sustainability can be turned into a kind of standard in elementary accounting assignments which is followed in finding the best solution. Finding out that a certain solution is environmentally, socially, and economically preferable for most stakeholders and for the student itself can be found rewardingly. As all things matter, accounting is full of subjective judgments, and tackling the right way a business transaction depends on what is good or bad. An accounting syllabus can open more broader space for students to express their judgments and to make decisions based on accounting principles and rules and their implicit knowledge. Moreover, the feeling of reward can result in self-efficacy.

Therefore, sustainable accounting education can be defined as the explicit establishment of logical application of accounting principles, rules, and concepts, critical, adaptive, and informative for decision-making which is socially, economically, and environmentally acceptable now and

in the future, backed up by implicit knowledge and teachers' advocacy. Sustainable accounting education is a self-sustaining educational paradigm whose objectives are self-reinforcing learning strategies and lifelong learning methods.

#### 4. CONTRADICTIONARY PRACTICE

The Strategy of the University of Economics – Varna, Bulgaria (2019-2023) (IU-Varna) has envisaged developing a sustainable university till 2023. This Strategy of IU-Varna is implemented as a response to art. 32 (3) of the Higher Education Act (ZVO) (2016), Development of Academic Staff in the Republic of Bulgaria Act (DASRBA), Strategy for the development of higher education in Bulgaria, National strategy for lifelong learning and National Strategy for the Development of Scientific Research in the Republic of Bulgaria 2017-2030. Sustainability is emphasized in the mission statement of the institution: “to be a leading educational and a scientific institution with an established identity in the educational space which places youth, education and culture at the center of its social and economic responsibility...IU-Varna promotes innovation, and digitalization, expands learning and professional horizons implementation, and offers competitive business solutions with a sustainable effect”. This declaration reflects three factors (Salmi, 2009), needed for clientelism structure: “(a) a high concentration of talent (faculty and students), (b) abundant resources to offer a rich learning environment and to conduct advanced research, and (c) favorable governance features that encourage strategic vision, innovation, and flexibility and that enable institutions to make decisions and to manage resources without being encumbered by bureaucracy”. Despite Salmi (2009) confessed that “to become a member of the exclusive group of world-class universities is not something achieved by self-declaration” (p. 15).

Through proclamations and actual project initiatives, each university can make a significant contribution to marketing strategies. Also, those can be legitimate university sustainability efforts. However, real sustainability requires changes in students' and educators' thinking about how to bring close sustainability concepts into their majors and classes.

Modernization and enhancement of the innovation capacity of IU-Varna is a fact.

A study by the Australian Research Institute in Education for Sustainability (ARIES: Martin and Steele, 2010) recommends that to be armored with sustainable thinking undergraduates should have soft skills – communication, teamwork, and problem-solving. There is a need for a deep-teaching learning approach as “...graduates who have learned how to learn, and who are capable of continuously adapting themselves to help in the ongoing development of society” (Biggs & Watkins, 2001) environment and economy. To be able to transform to self-reinforced education students have to regard knowledge not as a surface to their lives as human beings. Belonging to a university in Bulgaria, IU-Varna as an example, students see it as a way for acquiring a profession (63,3%). This is mentioned in an internal study of first-year students' attitudes at IU-Varna. Embarrassing is that 48.7% believe that enrolling in a university program is a desire to receive an academic diploma. Those are summarized results including students in the “Accounting” major. Such attitudes show some explicit bias which makes higher education susceptible to keeping alive the teacher-based paradigm. This contradicts sustainable education as it is broadly recognized in the literature (Jaya & Glenn, 2002). Nowadays, truly accounting education in IU-Varna continues to be based on textbooks and requirements to visit lectures and practicing classes to solidify conventional accounting rules and principles of Dt/Ct. Memorizing, listening to instructions, copying from the blackboard, and more are adapted as studying techniques. The educator is

turned into a “task-solving robot”. One reason is rooted deeply in constantly only with minor curriculum changes. Of course, there are some freshly added disciplines such as Academic studies, Management of company cash flows, Credit analysis and Management and collection of receivables; and the now-stopped program Accounting in English, certified by CIMA and ACCA. As a matter of fact, most of those disciplines are not backed up with textbooks and leave room for lecturer interpretation. Those present a field for educators to stimulate students to think critically, not just tell different facts about reality that are collected and systematized by the students. Another good venue for the development of soft skills is training in companies/industries. Bulgarian students in “Accounting” major at IU-Varna have opportunities to participate in “Studentski praktiki” (Nationwide programme; <https://praktiki.mon.bg/>) and after the third year of their bachelor's degree they put an exam on “Training education”. Viviers and de Villiers (2020) make a good synthesis of possible methodologies for learner-centered accounting study. Accounting education at IU-Varna has to implement a new set of accounting interventions in textbooks such as case studies, games, simulations, role-plays and field experiences (Viviers & de Villiers, 2020). These interventions need to be implemented from the first year for all students, studying Accounting Theory and likewise sustainable themes. Believe that the greater the students are exposed to sustainable thinking and innovative technologies, their critical thinking and self-reinforced behavior will become more articulated in decision-making in the years of academic environment and afterwards in social and work environments. In the above-mentioned internal study of IU-Varna, students express the need for improvement in communications with educators, working on initiatives different from discipline issues and discussing topics and ideas outside of class. In other words, the students feel the need to broaden their experience and knowledge with more intense dialogues with educators and coursemates.

## 5. FUTURE RESEARCH

Further research is needed about students’ perceptions to establish the linkages between sustainable thinking and accounting teaching. Furthermore, regarding teaching methods and technologies, clarification, and specification are well identified. Experiments can be conducted in class settings. It is possible to argue that the accounting curriculum should be re-designed to include some points of sustainability, not comprehensively, as it is not desirable to create on purpose “hidden curriculum”. And above all is that all needed if the employers do not look for employees with critical thinking and solving problems qualities?

## 6. CONCLUSION

Sustainable teaching accounting is far from implementation in IU-Varna. The university is transforming its market image but the accounting curricula do not open space to bridge the gap between conventional accounting rules and principles and sustainable thinking. Sustainable accounting teaching has to be introduced by educators in an innovative and captivating manner, using new interventions in accounting textbooks. Teacher-centered paradigm in accounting education is already obsolete and has to be substituted by a paradigm that sees critical thinking and problem-solving as key ingredients of the learning process. As long as students are treated as consumers not as partners will be hard to reach deep-learning outcomes and self-reinforcing accounting practice.

Accounting can be seen as a way to calculate everything in money. Notwithstanding accounting can have an enormous impact on social, environmental, and economic matters and their integration when the demands for sustainability are considered.




## References

- Amaral, A. R., Rodrigues, E., Gaspar, A. R., & Gomes, Á. (2020). A review of empirical data of sustainability initiatives in university campus operations. *Journal of Cleaner Production*, 250, 119558. <https://doi.org/10.1016/j.jclepro.2019.119558>
- Bebbington, J., & Thomson, I. (2001). Commentary on: Some thoughts on social and environmental accounting education. *Accounting Education*, 10(4), 353-355. <https://doi.org/10.1080/09639280210121141>
- Biggs, J., & Watkins, D. (2001). *Teaching the Chinese Learner: Psychological and Pedagogical Perspectives*. ISBN 10: 962809372X.
- Deegan, C. (2019). "Legitimacy theory: despite its enduring popularity and contribution, time is right for a necessary makeover", *Accounting, Auditing and Accountability Journal*, Vol. 32 No. 8, pp. 2307-2329.
- Delors, J. (1996). *Learning: The Treasure Within*. UNESCO: Paris, France. Retrieved from <http://books.openedition.org/ifra/3612>
- Dewey, J. (1916). *Democracy and Education: An Introduction to the Philosophy of Education*. Macmillan, New York
- Education and Training Monitor. (2020). Accessed: 19.07.2023., <https://op.europa.eu/webpub/eac/education-and-training-monitor-2020/countries/bulgaria.html#two>
- Jaya, G., & Glenn, S. L. (2002). Transformation through learning: Education about, for, and as sustainability, *Frontiers in Sustainability*, Vol. 3, <https://www.frontiersin.org/articles/10.3389/frsus.2022.982718>, ISSN 2673-4524.
- Lima Filho, R., & Casa Nova, S. P. de C. (2019). Self-Regulated Learning and Self-Determination Theory in Accounting Graduate Students in Brazil. *European Journal of Scientific Research*, 152, 236-255. Retrieved from <https://ssrn.com/abstract=3625625>
- Martin, A., & Steele, F. (2010). *Sustainability in Key Professions: Accounting*. A report prepared by the Australian Research Institute in Education for Sustainability for the Australian Government Department of the Environment, Water, Heritage and the Arts.
- O'Riordan, T., & Voisey, H. (1998). *The Politics of Agenda 21 in Europe*, Earthscan, London
- Sterling, S. (2001). *Sustainable education: Re-visioning learning and change*. Bristol: Schumacher Briefings.
- Panja, S. (2018). Creative methods of teaching accountancy - Its impact. <https://doi.org/10.31235/osf.io/n3y26>
- Pilotti, M. A. E., & Al Ghazo, R. (2020). Sustainable Education Starts in the Classroom. *Sustainability*, 12(22), 9573. <https://doi.org/10.3390/su12229573>
- Salmi, J. (2009). *The challenge of establishing world-class universities*. World Bank Publications.
- Sharma, U., & Stewart, B. (2021). Enhancing sustainability education in the accounting curriculum: an effective learning strategy. *Pacific Accounting Review*, 34(4), 614-633. <https://doi.org/10.1108/par-02-2021-0029>
- Van den Branden, K. (2012). Sustainable education: basic principles and strategic recommendations. *School Effectiveness and School Improvement*, 23(3), 285-304. DOI: 10.1080/09243453.2012.678865
- Viviers, H., & de Villiers, R. (2020). Teaching methodology in accounting education. *South African Accounting Education Stocktake*, 27-56. <https://doi.org/10.18820/9781928480471/02>
- Wolters, C. A. (2003). Regulation of Motivation: Evaluating an Underemphasized Aspect of Self-Regulated Learning. *Educational Psychologist*, 38(4), 189-205. [https://doi.org/10.1207/s15326985ep3804\\_1](https://doi.org/10.1207/s15326985ep3804_1)





# Exploring the Universities' Resilience in Times of Crisis by Reporting to the Pattern of the National Culture

Dragoș Valentin Dincă<sup>1</sup>   
Cristina Elena Nicolescu<sup>2</sup>   
Ionuț Bogdan Berceanu<sup>3</sup> 

Received: August 23, 2023  
Accepted: November 27, 2023  
Published: March 16, 2024

## Keywords:

The EU universities' resilience;  
Public expenditure;  
Hofstede's model of national culture



Creative Commons Non Commercial CC BY-NC: This article is distributed under the terms of the Creative Commons Attribution-Non-Commercial 4.0 License (<https://creativecommons.org/licenses/by-nc/4.0/>) which permits non-commercial use, reproduction and distribution of the work without further permission.

**Abstract:** *Amidst the COVID-19 pandemic, superior education demonstrated remarkable adaptability during crises, particularly by swiftly embracing a borderless virtual learning environment. From this perspective, the paper is focused on the resilience of the university educational system, underlining the importance of two key pillars that model it: the pattern of national culture and the level of public spending on education.*

*To this end and by reference to Hofstede's cultural dimensions theory, the paper highlights that the pattern of national culture explains a good deal of the levels of budget allocations on education between 2007-2020 of the current 27 EU member states.*

*Thus, beyond the good practices identified in the institutional development plan by implementing a new management model, the results of the paper analysis indicate the need to consolidate the national educational policies through proper financing of the field, towards achieving the European Education Area.*

## 1. INTRODUCTION

Education is a fundamental pillar of society, the development and modernization of the education system being a constant element on the public agenda and, thus, of the multiple reform measures. The educational strategies have mostly proven their efficiency, also reflected by the resilience of this system during the COVID-19 pandemic.

Considering the circumstances for superior education, the pandemic context has determined the entry of higher education institutions (HEI) in a crisis situation. Compared to other systems that were overwhelmed by the pandemic impact (especially by waves one and three in the spring and autumn of 2020), such as the health system, the superior education rapidly adapted to the new context by transferring the educational activities in the virtual environment.

For experienced universities that had expertise in this type of academic activity, the adjustment was a natural one. But, for the other universities, the transfer into the virtual environment was a type of „emergency remote teaching” (Hodges et al., 2020).

In order to ensure their operation, universities had to adapt their capacities and educational programs to the new, mainly digital, educational scenario and find hybrid solutions for some teaching activities that involve experiential learning (laboratories, practice, workshops a.s.o.).

<sup>1</sup> Faculty of Public Administration, National University of Political Studies and Public Administration, Expozitiei Blvd., 30A, 012103, Bucharest, Romania

<sup>2</sup> Faculty of Public Administration, National University of Political Studies and Public Administration, Expozitiei Blvd., 30A, 012103, Bucharest, Romania

<sup>3</sup> Faculty of Public Administration, National University of Political Studies and Public Administration, Expozitiei Blvd., 30A, 012103, Bucharest, Romania

Through the advantages offered, in only a few months, the virtual environment turned from a survival mode and a “place of refuge” in a crisis period, into a real organizational success formula.

The operation of the activities of these academic structures in the virtual environment started to be the new normality in the university education system’s policy. The current operating mode reflects a wider phenomenon than a precise reform determined by new teaching tendencies and/or by various unsolved organizational problems (lack of physical areas and amenities, a small pool of candidates, difficulty in the organization, and performance of remote or low-frequency education, etc.)

The universities no longer rely only on organizational structures but focus mostly on organizational behaviors. In other words, the measures of adaptation to the new pandemic context, a very uncertain one, unequivocally show a new dimension, one of organizational renewal in the context of activating a borderless space.

Each university has its modernization path, according to its orientations, rhythm, or means adopted to make these measures operational. The things these organizations have in common in their modernization steps refer to the resource effectiveness actions, the introduction of new regulations and procedures, the increase of the efficiency degree, the amendment of the organizational architecture’s design, and the dynamic of the actions performed. What differentiates them refers to how they can manage the legitimacy crisis they deal with once their action area grows by including the virtual environment.

Entering and staying in a new and insufficiently explored world also needs additional legitimacy compared to the institutional one offered by the legal regime, obtaining the accreditation, and having monopoly in its geographic domain.

In an area with special rules, with special requirements regarding the learning-teaching methodologies, and with a diverse public interested in obtaining more and more complex competences, the new legitimacy relies more than ever on another performance model.

Beyond the high training of the teaching staff, the attractiveness of the educational offers and the associated competences, the new performance is also measured concerning the university’s ability to stay connected with the beneficiaries of its services and with its partners (the academic community, other similar institutions, the business environment, the local community a.s.o) in the virtual environment.

The challenges are many. First of all, the new profile of the students becomes more international and with a wider and wider age range. The justifications for this change are obvious: the increase of the possibility to train in a virtual environment, as well as the desire and/or need to improve the competences throughout the whole life. Given the new demands, the universities must rapidly adapt their curriculum and the channels of communication with future beneficiaries.

Another important challenge refers to dismantling the university monopoly. The immersion into the virtual environment also maintains fierce competition between universities but, as [Veldsman \(2019\)](#) notices, also among them and other education suppliers (that offer a degree or not) outside the university sector.

Currently, a university that is interactive in the virtual environment is perceived as being more performant and more legitimate, because it is consistent with the current need of interested people to interconnect from any place on the globe and also to remain connected to the local collectivity they come from. In order to obtain the maximum audience for the supplied educational service, universities must develop their management system through the optimum combination of marketing-mix instruments (product, price, distribution and promotion). The university's inter-relationship capacity in the virtual environment becomes the cross-link for all these four marketing instruments.

But is this characteristic sufficient in the long run for the university to maintain its competitive advantage? Certainly not. The redesign of the informational and organizational system by expanding activities in the virtual environment is only a basic necessity that seems to shape the future of universities, but not a sufficient one. The exposed considerations reflect the stringent need for new endeavors that the universities must make to consolidate their mission and performance in an extremely uncertain future in which all of us (HEI implicitly) are hostages (see [Blanco, 2021, p. 178](#), for more detail). In this respect, it also targeted a better institutionalization of the good practices shown during the COVID-19 pandemic.

## 2. STEPS PERFORMED BY HEI TO INCREASE INSTITUTIONAL RESILIENCE

Recent scientific landmarks show a series of tendencies in the preparation of universities for the future, and which bear the “fingerprint” of post-COVID-19 recovery actions ([van't Land et al., 2021](#)). Among these, we have:

1. the transfer to the model of a democratic civic university aimed towards re-connecting to the community and ensuring sustainable development. The change was reflected in the consolidation of the universities' mandate on all its dimensions (research, teaching and serving society).

A successful initiative in this respect is represented by the conclusion of the recent revision of Magna Charta Universitatum (MCU) in 2020 through which universities restate the adherence to fundamental academic values, as well as taking over a new behavior, more civically involved and active, more socially inclusive and responsible and which shall direct their activities to the XXIst century. This promise undertaken by every institution shall contribute to increasing the confidence the civil society grants to universities within the social contract the two “signatory” parties have.

Currently, universities have an increased responsibility for the development of human democracy and conditions, moreover as the HEI civil and democratic purposes have obtained the highest level of importance from their statement over 270 years ago by Benjamin Franklin (see [Harkavy, 2021, p. 55](#), for more detail). The consolidation of their active role in solving the problems of society shall contribute to diminishing the „substantial criticism from various sides and perspectives” they currently face ([Noorda, 2018, p. 28](#)).

In light of the new institutional model, universities must ensure that students more sophisticated values, knowledge and competences to approach the „global citizenship and local contextual challenges of the present and the future” ([UNESCO, 2014, p. 1](#)), such as systems thinking competency, strategic competency, collaboration competency, critical thinking competency, integrated problem-solving competency a.s.o. (see [UNESCO, 2018, p. 10](#), for more detail).

The endeavor can be supported by a series of approaches already successfully used in the academic environment and which one must continue to promote: experiential learning, volunteering projects, learning throughout life a.s.o.

But a major challenge is maintained. Technological innovation and digitalization continue to lead to deepening inequalities and even diminish the progress obtained from universities until the start of the COVID-19 pandemic, due to a lack of IT infrastructures and/or digital competences of its beneficiaries.

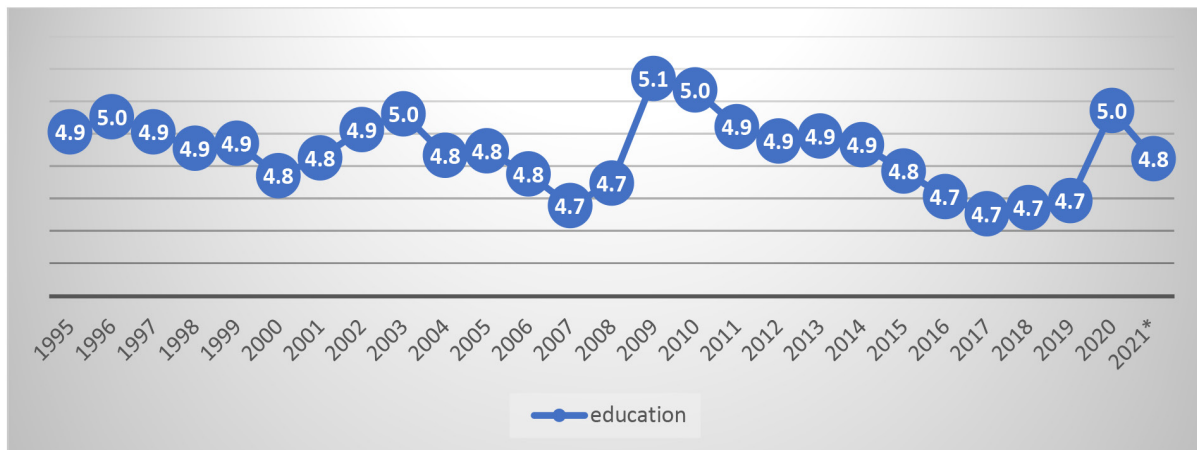
2. continuous promotion of academic values. [Noorda and Lock \(2021\)](#) grant this educational marketing instrument the degree of “global currency with local impact for universities”. The recognition and undertaking of academic values represents an important vehicle through which universities identify, present their mission and even justify their decisions in time of crisis. In addition, the transparency regarding the services and performances of the universities reduces the informational asymmetry and leads to an increase in the trust of the beneficiaries in HEI.
3. the sharing and transfer of knowledge and resources through the consolidation and expansion of the collaboration of universities with higher education institutions and other stakeholders in the country and abroad, from the public sector, business environment, civil society a.s.o. Partnerships benefit from the added value generated by universities by structuring and developing knowledge, but also by facilitating the “lighting” and emergency of the new.

The strategic framework for European cooperation in education and training towards the European education area and beyond, as well as the initiative package of the European Commission adopted on January 18, 2022, the European strategy for universities and the Proposal for a Council Recommendation on building bridges for effective European higher education cooperation, highlight the fact that the future of universities belongs to international cooperation across borders and cultures (see [Council, 2021a, 2021b](#); [European Commission, 2022a, 2022b](#), for more detail).

The need for expansion is based on an inherent characteristic of social systemic and specifically, on the information non-genotropic principle. According to this principle applied to universities (considered as social organizations), the more isolated they are and the less they exchange information, the less capable they are of maintaining a certain degree of non-geotropy (differentiation and organization) and the more vulnerable they are towards the factors in the internal and external environment (see [Matei, 2006, p. 57](#) for more detail). The idea of an isolated higher education institution that employs its full capacity only to comply with its interests is no longer valid (see [de la Fuente, 2021, p. 21](#), for more detail).

4. orientation is more inclined to support learning throughout life, recognized as being a “right to learning” ([Singh, 2016, art. 43](#)). The assurance of this learning cycle is not only one of the purposes that form the mission of each university but also an approach which shall support the increase of HEI resilience in front of the new challenges of the usage of TIC (technologies of information and communication) in all activity sectors and of a world which will be even more strongly connected in the near future.

At the EU level, in light of the socio-economic consequences caused by the COVID-19 pandemic and amplified by Russia's war of aggression against Ukraine, the **Council resolution on The European Education Area (2023)**, the efficiency of the expenses is placed in the center of economic recovery, as well as of the recovery of the resilience of national education systems. The identification of the optimum level for budget allocations remains an open challenge for member states. Recent **Eurostat (2023a)** statistical data reflect that the evolution of 'education' expenditure over 1995-2021 was a tortuous one (Figure 1). In 2021 the general government expenditure in the EU on 'education' (as a share of GDP) registers a new minimum (4.8% of GDP), amid the GDP decrease during the COVID-19 pandemic.



**Figure 1.** Evolution of 'education' expenditure over 1995-2021 (% of GDP)

Source: Eurostat, 2023a

### 3. THE CORRELATION BETWEEN THE PATTERN OF NATIONAL CULTURE AND THE LEVEL OF PUBLIC SPENDING ON EDUCATION, AT EU27 (FROM 2020)

At the EU level, the member states undertook a common effort so that „the European Education Area can become a reality by 2025” (Council, 2023). Thus, the national policies of member states are defined to contribute to reaching this ideal. Progress is promising (Council, 2023) but a series of obstacles remain, reflected in the „large differences between countries in the importance of expenditure on education” underlined by the data of Eurostat (2023a).

From this perspective, the authors of this work think that the national levels of public spending on education are partially justified by the influence of the pattern of national culture, despite the integration of common values and a convergence belief by the member states (Hofstede, 1983, p. 75) of the supra-national EU construction they are part of.

The analysis performed to test this hypothesis is based on Hofstede's cultural dimensions theory and Hofstede's model of national culture (Hofstede, 2011) subsumes six operational dimensions (Hofstede, 2011, pp. 7-8) assessed through scores for 111 countries:

1. Power Distance, related to the different solutions to the basic problem of human inequality (PDI);
2. Uncertainty Avoidance, related to the level of stress in a society in the face of an unknown future (UAI).
3. Individualism versus Collectivism, related to the integration of individuals into primary groups (IND).

4. Masculinity versus Femininity, related to the division of emotional roles between women and men (MAS).
5. Long-Term versus Short-Term Orientation, related to the choice of focus for people's efforts: the future or the present and past (LTO).
6. Indulgence versus Restraint, related to the gratification versus control of basic human desires related to enjoying life (IVR).

Two out of the six dimensions, UAI and MAS are less influenced by the economic dynamics (Tang & Koveos, 2008, p. 1046).

For the current work we selected from the dimension data matrix (Hofstede Insights, 2023) of Hofstede's model of national culture, the scores of the six dimensions related to the current EU member states, except for Cyprus (for which no complete data is available), data shown in table 1.

In relation to the general government expenditure on education (% of GDP) for all 27 EU Member States two time intervals were considered for analysis:

1. the 2014-2019 interval overlaps over the budget programming period 2014 - 2020, but the year 2020 corresponding to the start of the COVID-19 pandemic, when the budget allocations were strongly influenced by the socio-economic impact of the SARS-CoV-2 health crisis, was eliminated.
2. the 2007-2020 interval, corresponding to the two budget programming periods 2007 - 2013 and 2014-2020, without considering the pandemic impact on public decisions and budget allocations.

Also, for both time intervals, we considered the average of this expenditure (% of GDP) seen in terms of accumulation of financial resources.

The statistical correlation between the ranking of general government expenditure (% of GDP) on education and the classification of the scores for each of the six dimensions of Hofstede's model of national culture led to the following results:

1. for both time intervals considered for analysis, 2007-2020, respectively, and 2014-2019, the statistical correlation is insignificant for five out of the six dimensions of Hofstede's model (PDI, UAI, IND, LTO and IVR).
2. The statistical correlation between the ranking of general government expenditure (% of GDP) on education and the classification of the scores for MAS reflect a moderate negative relationship for both time intervals and these results are significant (at probability value  $p < .05$  and also at  $p < .01$ ). The correlation is stronger for the longer time interval between 2007-2020 (see Table 1; the Spearman's rank coefficient of correlation ( $\rho$ )= -0,62,  $p=0.0008$ ,  $R^2=0,38$ ), than for the shorter time interval between 2007-2019 ( $\rho=-0,55$ ,  $p=0.0036$ ,  $R^2=0,30$ ).

According to Hofstede (1994), the higher the MAS value, the national culture is distinguished by a stronger prevalence of some values „like assertiveness, performance, success and competition” compared to values such as solidarity or quality of life (p. 6).

The results of the empirical analysis highlight the fact that the pattern of national culture, in light of MAS, explains more than 38% ( $R^2=0.38$ ) of the levels of public spending on education.

The identified correlation shows that, for the most part, the EU member states that are distinguished by a culture more oriented towards solidarity or maintaining a higher standard of quality of life (lower MAS values) tend to assign more consistent budgets (as a share of GDP) for education, than the states with a national culture much more oriented towards performance and success (higher MAS values).

**Table 1.** The correlation between the pattern of public spending on education (2007-2020) and the 6-D of the Hofstede model of national culture (at the EU level)

EU 27 (from 2020)	Average of total general government expenditure on education (% of GDP)		Culture Dimensions Scores (0 = low, 100 = high)						
	2014-2019	2007-2020	PDI	IND	UAI	LTO	IVR	MAS	
Italy	3.93	4.12	50	76	75	61	30	70	
Spain	4.05	4.21	57	51	86	48	44	42	
Austria	4.85	4.92	11	55	70	60	63	79	
Germany	4.27	4.26	35	67	65	83	40	66	
Sweden	6.67	6.57	31	71	29	53	78	5	
Finland	5.87	6.06	33	63	59	38	57	26	
Denmark	6.67	6.65	18	74	23	35	70	16	
Croatia	4.97	5.09	73	33	80	58	33	40	
Belgium	6.22	6.15	65	75	94	82	57	54	
Poland	5.08	5.30	68	60	93	38	29	64	
Lithuania	4.75	5.23	42	60	65	82	16	19	
Bulgaria	3.70	3.69	70	30	85	69	16	40	
Slovakia	4.02	4.09	100	52	51	77	28	100	
Slovenia	5.55	5.94	71	27	88	49	48	19	
Romania	3.18	3.41	90	30	90	52	20	42	
Estonia	5.85	6.09	40	60	60	82	16	30	
Hungary	5.03	5.08	46	80	82	58	31	88	
The Czech Republic	4.40	4.49	57	58	74	70	29	57	
Latvia	5.77	5.89	44	70	63	69	13	9	
France	5.37	5.44	68	71	86	63	48	43	
Portugal	4.78	5.39	63	27	99	28	33	31	
Netherlands	5.20	5.31	38	80	53	67	68	14	
Greece	4.07	4.15	60	35	100	45	50	57	
Ireland	3.53	4.14	28	70	35	24	65	68	
Luxembourg	4.53	4.68	40	60	70	64	56	50	
Malta	5.05	5.27	56	59	96	47	66	47	
Correlation between the total general government expenditure (% of GDP) on education (average 2014-2019) and each of the 6 D Hofstede's model of national culture	rho=-0.29	rho=0.41	rho=0.20	rho=-0.02	rho=0.36	rho=-0.55	No relationship		*
Correlation between the total general government expenditure (% of GDP) on education (average 2007-2020) and each of the 6 D Hofstede's model of national culture	rho=-0.31	rho=0.36	rho=0.18	rho=-0.08	rho=0.35	rho=-0.62	No relationship		**

\* A moderate negative relationship (Probability value:  $p < .01$ )  
The coefficient of determination  $R^2=0,30$

\*\* A moderate negative relationship (Probability value:  $p < .01$ )  
The coefficient of determination  $R^2=0,38$

**Source:** Own processing based on the Eurostat data (2023b) and the dimension data matrix of the Hofstede model (Hofstede Insights, 2023)

#### 4. FUTURE RESEARCH DIRECTIONS

Contributions to this paper may lead to new lines of research in the field of educational policy. Between these are distinguished:

1. the expansion of the time frame for the refining of the statistical correlation between the public spending on education at the EU level and the pattern of national culture.

A longer time frame covers to a larger extent the changes in economic conditions but could offer additional information regarding the development of the statistical correlation value, upon the EU expansion.

2. identification of the impact of the determinants of Hofstede's framework on the educational policies promoted by the subnational level of public administration. Special attention must be given to countries with decentralized administrative systems, in whose case local authorities have competences in the education field together with the central public administration authorities.

#### 5. CONCLUSION

Through this research regarding the universities' resilience in times of crisis, a series of tendencies outlined by the HEI steps for the improvement of the organizational functionality during the SARS-CoV-2 health crisis were highlighted. A part of these initiatives were consolidated during the post-crisis period the increase of institutional resilience, especially considering a new possible crisis situation. We notice that the maximization of the advantages of a borderless area is one of the current tendencies that shape the future of universities.

The paper outlines that a new institutional management model is insufficient in order to increase the resilience of universities during times of crisis, also a proper level of general government expenditure on education is necessary.

The level of public budget allocations on education is influenced by the pattern of national culture, an input that is difficult to change in such a short period and which, in case of underfunding, affects the resilience of universities in the long run.

Certain characteristics of the pattern of national culture (the dimensions of Masculinity versus Femininity) explain more than 38% ( $R^2=0,38$ ) of the levels of budget allocations of the 26 EU member states (Cyprus was excepted) in the period 2007-2020.

From this perspective, at HEI level a new institutional performance model is necessary to counterbalance the legitimacy crisis and increase institutional resilience in crisis situations, based on two fundamental pillars:

1. implementation of the marketing vision (based on marketing mix: product, price, distribution, and promotion).
2. the promotion of sturdy and constant educational policies in relation to budget allocations meant for education and adapted to the pattern of national culture for the increase of the population's acceptance degree. At the EU level, for some member states, reaching this optimum of budget allocations means an increase in public spending on education.



## Acknowledgment

This research was supported by the National University of Political Studies and Public Administration (SNSPA), within the project "Service Based Learning - innovative tool for strengthening the skills of employing students in the public administration of the 21<sup>st</sup> century", won the competition for grants - Researchers in Training – National University of Political Studies and Public Administration (SNSPA) / Faculty of Public Administration 2019, implementation period 2019-2023 (contracting Authority: SNSPA).

## References

- Blanco, G. L. (2021). Higher Education and the Enduring Value of Hospitality: Reflections for the 21st Century. In van't Land, H., Corcoran, A., & Iancu, D.C. (Eds.), *The Promise of Higher Education. Essays in Honour of 70 Years of IAU* (pp. 175-178). Cham, Switzerland: Springer. <https://doi.org/10.1007/978-3-030-67245-4>
- Council. (2021a). Resolution on a strategic framework for European cooperation in education and training towards the European Education Area and beyond (2021-2030) 2021/C 66/01. *Official Journal*, C 66, 1-21. EUR-Lex. [https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32021G0226\(01\)](https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32021G0226(01))
- Council. (2021b). Resolution on the governance structure of the strategic framework for European cooperation in education and training towards the European Education Area and beyond (2021-2030) 2021/C 497/01. *Official Journal*, C 497, 1-4. EUR-Lex. [https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32021G1210\(01\)](https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32021G1210(01))
- Council. (2023). Resolution on The European Education Area: Looking to 2025 and beyond 2023/C 185/08. *Official Journal*, C 185, 35-38. CELEX: [https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32023G0526\(01\)](https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32023G0526(01))
- de la Fuente, J. R. (2021). The IAU and Contemporary Global Challenges: A Latin American Point of View. In van't Land, H., Corcoran, A., & Iancu, D.C. (Eds.), *The Promise of Higher Education. Essays in Honour of 70 Years of IAU* (pp. 21-23). Cham, Switzerland: Springer. <https://doi.org/10.1007/978-3-030-67245-4>
- European Commission. (2022a). Proposal for a COUNCIL RECOMMENDATION on building bridges for effective European higher education cooperation, COM/2022/17 final. EUR-Lex. <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52022DC0017&qid=1692173871322>
- European Commission. (2022b). Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions on a European strategy for universities, COM(2022) 16 final. EUR-Lex. <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=COM:2022:16:FIN>
- Eurostat. (2023a). General government expenditure by function (COFOG). [Data set]. [https://ec.europa.eu/eurostat/cache/metadata/en/gov\\_10a\\_exp\\_esms.htm](https://ec.europa.eu/eurostat/cache/metadata/en/gov_10a_exp_esms.htm) Last update: 27/02/2023.
- Eurostat. (2023b). General government expenditure by function (COFOG). [Data set]. [https://ec.europa.eu/eurostat/databrowser/view/gov\\_10a\\_exp/default/table?lang=en](https://ec.europa.eu/eurostat/databrowser/view/gov_10a_exp/default/table?lang=en) Last update: 27/04/2023.
- Harkavy, I. (2021). Creating Democratic Civic Universities in a Post-COVID-19 World: The IAU and Global Collaboration. In van't Land, H., Corcoran, A., & Iancu, D.C. (Eds.), *The Promise of Higher Education. Essays in Honour of 70 Years of IAU* (pp. 55-61). Cham, Switzerland: Springer. <https://doi.org/10.1007/978-3-030-67245-4>

- Hodges, C., Moore, S., Lockee, B., Trust, T., & Bond, A. (2020). *The difference between emergency remote teaching and online learning*, Educase Review "Why IT Matters to Higher Education". <https://er.educause.edu/articles/2020/3/the-difference-between-emergency-remote-teaching-and-online-learning>
- Hofstede, G. (1983). The Cultural Relativity of Organizational Practices and Theories. *Journal of International Business Studies*, 14(2), 75–89. <http://www.jstor.org/stable/222593>
- Hofstede, G. (1994). Management Scientists Are Human. *Management Science*, 40(1), 4–13. <http://www.jstor.org/stable/2632841>
- Hofstede, G. (2011). Dimensionalizing Cultures: The Hofstede Model in Context. *Online Readings in Psychology and Culture*, 2(1). <https://doi.org/10.9707/2307-0919.1014>
- Hofstede Insights. (2023). Country Comparison Tool. [Data set]. <https://www.hofstede-insights.com/country-comparison-tool>
- Matei, L. (2006). *Management public* (2nd, ed.). Bucharest: Economica Publisher.
- Noorda, S. (2018). Autonomy: A practice serving a purpose. In Heijnen, A., & van der Vaart, R. (Eds.), *Places of Engagement: Reflections on Higher Education in 2040 - A Global Approach* (pp. 23–29). Amsterdam University Press. <https://doi.org/10.2307/j.ctvfjd0xs.5>
- Noorda, S., & Lock, D. J. (2021). Promoting Values Together: Global Currency with Local Impact for Universities. In van't Land, H., Corcoran, A., & Iancu, D. C. (Eds.), *The Promise of Higher Education. Essays in Honour of 70 Years of IAU* (pp. 133-136). Cham, Switzerland: Springer. <https://doi.org/10.1007/978-3-030-67245-4>
- Singh, K. (2016). Report of the Special Rapporteur on the Right to Education, A/71/358 General Assembly. New York: General Assembly of NU.
- Tang, L., & Koveos, P. E. (2008). A Framework to Update Hofstede's Cultural Value Indices: Economic Dynamics and Institutional Stability. *Journal of International Business Studies*, 39(6), 1045–1063. <http://www.jstor.org/stable/25483321>
- UNESCO. (2014). *Aichi-Nagoya Declaration on Education for Sustainable Development, UNESCO World Conference on Education for Sustainable Development*. Aichi-Nagoya, Japan. <https://unesdoc.unesco.org/ark:/48223/pf0000231074>
- UNESCO. (2018). *Education for Sustainable Development Goals. Learning Objectives. Education 2030*. Paris: UNESCO. [https://www.unesco.de/sites/default/files/2018-08/unesco\\_education\\_for\\_sustainable\\_development\\_goals.pdf](https://www.unesco.de/sites/default/files/2018-08/unesco_education_for_sustainable_development_goals.pdf)
- van't Land, H., Corcoran, A., & Iancu, D. C. (Eds.). (2021). *The Promise of Higher Education. Essays in Honour of 70 Years of IAU*. Cham, Switzerland: Springer. <https://doi.org/10.1007/978-3-030-67245-4>
- Veldsman, T. H. (June 28, 2019). *Higher education institutions need to face up to the future*, *Mail and Guardian*. (In Press). <https://mg.co.za/article/2019-06-28-00-higher-education-institutions-need-to-face-up-to-the-future/>



# Factors Associated with Self-Perceived Health Status in the Slovak Republic

Viera Labudová<sup>1</sup> 

Received: August 16, 2023  
Accepted: January 10, 2024  
Published: March 16, 2024

## Keywords:

Self-perceived health;  
EU-SILC;  
Logistic regression



Creative Commons Non Commercial CC BY-NC: This article is distributed under the terms of the Creative Commons Attribution-Non-Commercial 4.0 License (<https://creativecommons.org/licenses/by-nc/4.0/>) which permits non-commercial use, reproduction and distribution of the work without further permission.

**Abstract:** *Self-perceived health (SPH) expresses a subjective assessment by the respondent of his/her health. When assessing his/her health, the respondent states one of the following categories: 1: very good, 2: good, 3: fair, 4: bad, 5: very bad. This paper aimed to analyze the influence of individual characteristics of persons aged 16 and over in the Slovak Republic on the subjective perception of health and quantify the intensity of their impact. For this purpose, a logistic regression model was used to predict "good health" (categories 'very good' or 'good'). As explanatory variables for the logistic regression model have included these demographic or socio-economic indicators: marital status, age, the highest level of education attained based on the ISCED, main activity status, severe material deprivation, equalized household disposable income, degree of urbanization, and NUTS 3 region. The analysis was performed using the SAS Enterprise Guide on a sample of data from the EU SILC 2021 survey.*

## 1. INTRODUCTION

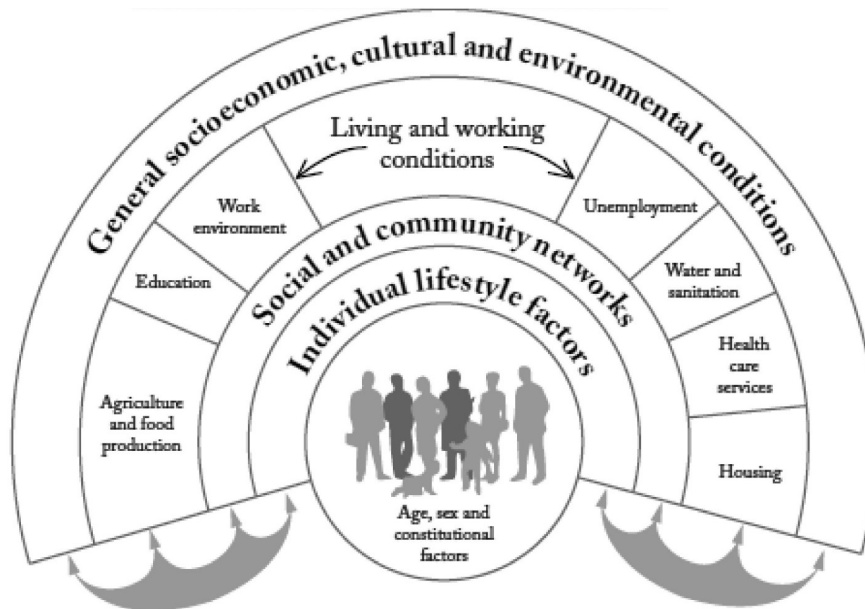
Health is an important attribute of the quality of life and general well-being of an individual. It has a functional value, and it is also important for the person's own identity (Blaxter, 2004). "Health is a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity" (World Health Organization, 1948).

The social conditions of people's lives strongly affect their chances for a healthy life. Poverty, social exclusion, discrimination, bad or unhealthy living conditions, and low employment status are some of the important determinants of most diseases, deaths, and health inequalities between and within countries (World Health Organization, 2018).

The existence of health inequalities leads to the belief that health is socially determined by factors that originate on different social levels (individual, structural). The efforts to conceptualize the effects of these determinants resulted in models of social health determinants. One of the most well-known is the Dahlgren-Whitehead model (Whitehead & Dahlgren, 2007). The concept of social determinants of health according to this model is shown in Figure 1. At its center are people, as part of a broader social system. They possess characteristics such as age, gender, and other personality traits, such as genetic predispositions, which can be considered constants at each moment. However, they are surrounded by variable factors. The first layer contains personal behavior factors, such as smoking, alcohol, and other addictive substances, as well as the physical activity of the person. Another layer of the concept of social health determinants consists of those characteristics that are related to the interaction of people with their peers or with the community in which they live. At a certain period of the person's life cycle, they start to have a major effect on the environment and working conditions (food supply, access to basic goods and services, access

<sup>1</sup> Faculty of Economic Informatics, University of Economics in Bratislava, Dolnozemska cesta 1, 852 35 Bratislava, Slovak Republic

to education, employment, living conditions, etc.). These are included in the third layer. The final layer consists of economic, cultural, and environmental factors. This model of conceptualization of the health determinants emphasizes interactions between the individual lifestyle, which is incorporated into social standards, and the living and working conditions, which are related to the broader socioeconomic and cultural environment (Whitehead & Dahlgren, 2007).



**Figure 1.** The Main Determinants of Health

Source: Whitehead & Dahlgren, 2007

Self-perceived health (SPH) (Self-rated health (SRH) or self-assessed health (SAH)) is a measure, in which people provide an assessment of their own general health. Self-perceived health can be defined as a general assessment of health done through subjective self-assessment. This indicator is considered an integrated indicator of health, which is related to the social, psychological, and biological aspects of the individual. The World Health Organization recommends it as a strong indicator of life expectancy and the health of the population (Silva et al., 2017). In the EU SILC and EHIS surveys, the Minimum European Health Module (MEHM) consists of 3 questions: subjective health assessment (SPH), the presence of a chronic disease or long-term health problem, and limitations in carrying out normal daily activities due to chronic diseases or long-term health problems.

The aim of this paper is to identify the factors that determine the subjective perception of health (Self-perceived health – SPH).

## 2. DATA AND METHODOLOGY

The analysis, the results of which are presented in this article, was based on data from the EU SILC survey (European Commission, 2021). We used the cross-sectional component of the EU SILC 2021 survey. Individual data were provided by the Statistical Office of the Slovak Republic. The dataset is composed of 11,755 records of respondents aged 16 and over.

A logistic regression model to find out the factors that influence self-perceived health is used. The modeled dependent variable was *self-perceived health*. The variable self-perceived health

was created from the variable general health. The variable general health has five categories: 1 = very good; 2 = good; 3 = fair; 4 = bad, and 5 = very bad. The values (categories) of this variable are the result of measurement on a 5-point scale. Respondents aged 16 and over answered the question: “How do you assess your health condition overall?” (European Commission, 2021). For the binary logistic regression, the categories 1 = very good, and 2 = good were merged, while a new category "good health" (value 1) was created. The categories 3 = fair, 4 = bad, and 5 = very bad were also merged, and a new category "poor health" (value 0) was created from them. This method of categorization states e. g. Manderbacka et al. (1999). A binary logistic regression model was used to predict "good health" (value 1).

The independent variables in the model were these demographic and socio-economic indicators:

- *age* (year of the survey minus year of birth minus 1). Age was grouped into four categories: 1 = 16–24 years; 2 = 25–44 years; 3 = 45–64 years; 4 = above 65 years,
- *degree of urbanization* with three categories: 1 = cities (densely populated area); 2 = towns and suburbs (intermediate area); 3 = rural areas (thinly populated area),
- *educational attainment level* with three categories: 1 = low (less than primary, primary and lower secondary education); 2 = medium (upper secondary and post-secondary non-tertiary education); 3 = high (tertiary education),
- *equalized household disposable income* with five categories: 1 = the first quintile; 2 = the second quintile; 3 = the third quintile; 4 = the fourth quintile; 5 = the fifth quintile,
- *main activity status* with four categories: 1 = employed; 2 = unemployed; 3 = student, pupil, fulfilling domestic tasks, compulsory military, or civilian service and other; 4 = retired or unable to work due to long-standing health problems),
- *marital status* with four categories: 1 = never married; 2 = married; 3 = separated, widowed, or divorced),
- *severe material deprivation* (at least 4 out of 9 deprivation items<sup>2</sup>) with two categories: 1 = household is deprived; 2 = household is not deprived),
- *NUTS 3* with eight categories<sup>3</sup>: 1 = Bratislava Region; 2 = Trnava Region; 3 = Trenčín Region; 4 = Nitra Region; 5 = Žilina Region; 6 = Banská Bystrica Region; 7 = Košice Region; 8 = Prešov Region (European Commission, 2021).

Logistic regression extends the idea of linear regression to the situation where the dependent variable,  $Y$ , is binary (Agresti & Finlay, 2014). The predictors can be quantitative, qualitative, or both types (Agresti, 2019). Letting  $Y$  be the binary dependent variable, which can take only the values 0 or 1 and  $X_1, X_2, \dots, X_k$  is a set of  $k$  predictors (quantitative and dummy variables). Level 1 usually represents the occurrence of an event of interest. It is assumed that  $P(Y = 1)$  is possibly dependent on  $\mathbf{x} = (x_0, x_1, \dots, x_k)$ , a vector of  $k$  predictor's values. The goal is to model  $p(\mathbf{x}) = P(Y = 1 | \mathbf{x})$ . Modelling  $p(\mathbf{x})$  is really modelling  $E(Y) = E(Y | \mathbf{x}) = \pi$ . The logistic regression model has a linear form for the logit of this probability (Agresti, 2019):

$$\ln \frac{\pi}{1-\pi} = \beta_0 + \sum_{j=1}^k \beta_j x_j \quad (1)$$

An alternative formula for logistic regression refers directly to the probability:

$$\pi = \frac{\exp(\beta_0 + \sum_{j=1}^k \beta_j x_j)}{1 + \exp(\beta_0 + \sum_{j=1}^k \beta_j x_j)} \quad (2)$$

<sup>2</sup> A severe material deprivation is defined as the enforced lack of at least four out of nine material deprivation items in the economic strain and durables dimension (Statistical Office of the Slovak Republic, 2020).

<sup>3</sup> Variables refer to the region of the residence of the household at the date of interview.

When interpreting the estimated parameters of the model, logistic regression uses the odds ratio, abbr. *OR*:

$$OR_{x_1, x_0} = \frac{\text{chance for the group } x_{j1}}{\text{chance for the group } x_{j0}} \quad (3)$$

where  $x_{j1}$  represents one group of cases that differs from the other group  $x_{j0}$  only in the values of the variable  $X_j$ . (Agresti, 2019; Hosmer et al., 2013). The values of the other variables are the same for group  $x_{j1}$  as for group  $x_{j0}$ . The odds ratio is a measure that quantifies the effect of a presumed causal factor on the occurrence of one of two possible situations (two possible outcomes).

### 3. RESEARCH RESULTS

The results of the logistic regression model are presented in Tables 1–3. To assess the quality of the model, we used three statistics: AIC – Akaike's Information Criterion, SC – Schwarz Criterion and  $-2 \log L$  – the logarithmic transformation of the likelihood function  $L$  (Table 1). Based on these measures, the estimated logistic regression model with predictors (column Intercept and Covariates) is better than a model that has only an intercept (column Intercept only). The values of these measures (AIC, SC,  $-2 \log L$ ) are lower for the estimated model with predictors (Allison, 2012).

**Table 1.** Fit Statistics of Model

Criterion	Intercept Only	Intercept and Covariates
AIC	16014.385	11125.679
SC	16021.757	11317.337
$-2 \log L$	16012.385	11073.679

Source: Own processing in SAS Enterprise Guide

Table 2 shows the results of testing the statistical significance of the model. The null hypothesis states that all parameters of the model are equal to zero (none of the input variables has a statistically significant effect on self-perceived health). The alternative hypothesis states that at least one parameter of the model is non-zero (at least one of the input variables has a statistically significant effect on self-perceived health). Three different tests were used: Likelihood Ratio test, Score test and Wald test. Each of the tests had a p-value less than 0.01. Therefore, we can reject the null hypothesis and accept the hypothesis that at least one input variable has a statistically significant effect on the modelled variable.

**Table 2.** Results of global null hypothesis testing

Test	Chi-Square	DF	Pr > ChiSq
Likelihood Ratio	4938.7060	25	< .0001
Score	4362.3225	25	< .0001
Wald	3166.0453	25	< .0001

Source: Own processing in SAS Enterprise Guide

In Tab. 3 are point estimates of model parameters (Parameter Estimate), standard errors of estimates (Standard Error) point estimates of odds ratios (Odds Ratio Estimate) and results of testing their statistical significance (Wald Chi-Square; p-value). Each categorical variable that had  $m$  categories was replaced by  $m-1$  dummy variables. The estimated model has 25 parameters, of which 14 are statistically significant. Odds ratio estimates were used to interpret the values of the estimated parameters.

**Table 3.** Analysis of Maximum Likelihood Estimates and Odds Ratio Estimates

Effect	Parameter Estimate	Odds Ratio Estimate	Standard Error	Wald Chi-Square	p-value
<b>Age</b>					
age (16-24)	2.2818	9.794	0.1906	143.2561	<.0001
age (25-44)	1.0746	2.929	0.1029	108.9710	<.0001
age (45-64)	-0.1153	0.891	0.0796	2.0963	0.1477
age (65+)	reference category				
<b>Main activity status</b>					
employed	1.8285	6.224	0.0762	575.5442	<.0001
unemployed	1.4062	4.080	0.1274	121.7832	<.0001
student, pupil, fulfilling domestic tasks, and other	2.3450	10.433	0.1672	196.7735	<.0001
retired or unable to work	reference category				
<b>Equalized disposable income</b>					
2nd quintile	-0.0351	0.965	0.0789	0.1979	0.6564
3rd quintile	0.1136	1.120	0.0793	2.0522	0.1520
4th quintile	0.2471	1.280	0.0806	9.3905	0.0022
5th quintile	0.5279	1.695	0.0844	39.1166	<.0001
1st quintile	reference category				
<b>Severe deprivation</b>					
not deprived	0.5602	1.751	0.1095	26.1929	<.0001
deprived	reference category				
<b>Marital status</b>					
never married	-0.0381	0.963	0.1001	0.1446	0.7038
married	0.1230	1.131	0.0834	2.1738	0.1404
widowed	-0.4847	0.616	0.1110	19.0743	<.0001
divorced	reference category				
<b>The highest level of education attained based on the ISCED</b>					
medium	0.4136	1.512	0.0825	25.1423	<.0001
high	0.8573	2.357	0.0997	73.9177	<.0001
low	reference category				
<b>Degree of urbanization</b>					
cities	0.1502	1.162	0.0711	4.4671	0.0346
towns and suburbs	-0.0479	0.953	0.0550	0.7576	0.3841
rural area	reference category				
<b>Region</b>					
Bratislava Region	0.5056	1.658	0.1033	23.9554	<.0001
Trnava Region	0.1508	1.163	0.0981	2.3620	0.1243
Trenčín Region	0.1958	1.216	0.0955	4.2055	0.0403
Nitra Region	0.3146	1.370	0.0914	11.8547	0.0006
Žilina Region	-0.0691	0.933	0.0905	0.5837	0.4449
Banská Bystrica Region	0.0574	1.059	0.0895	0.4116	0.5211
Košice Region	0.1598	1.173	0.0934	2.9255	0.0872
Prešov Region	reference category				

Source: Own processing in SAS Enterprise Guide

The difference in the perception of good health was manifested mainly when comparing different age categories of respondents and when comparing respondents who differ in main activity status and education level. The age categories (16–24) (odds = 9.794) and (25–44) (odds = 2.929) had a significant influence on good self-perceived health. Pensioners and those unable to work perceive their health the least positively. The chance that an employed respondent evaluates his overall health condition as good (very good or good) is 6.224 times higher, and the chance for the category of student, pupil, fulfilling domestic tasks, and other is even 10.433 times higher

than the chance for the reference category (retired or unable to work). There is a statistically significant difference in health assessment expressed through the odds ratio between respondents with high and respondents with low education (odds ratio (high vs. low) = 2.357). Based on the results of the analysis, we can conclude that a higher equivalent disposable income is strongly associated with good SPH status (odds ratio (fifth vs. first quintile) = 1.695, odds ratio (fourth quintile vs. first quintile) = 1.280). The respondent's marital status also affects the self-assessment of health. The chance of evaluating your health as good is 1.131 times higher for married people than for divorced people (*ceteris paribus*). Another statistically significant factor affecting self-assessment of health is the indicator of severe material deprivation. If a person faces an enforced lack of at least three out of nine material deprivation items in the economic strain and durables dimension, his chance of evaluating his health status as good is only 57 percent of the chance of a materially non-deprived person.

#### 4. CONCLUSION

The objective of the paper was to identify the factors that have a statistically significant effect on the subjective perception of self-perceived health in the Slovak population aged 16 and over in 2021. A logistic regression model was used to identify and quantify the strength of their effect. The dependent variable was the binary variable self-rated health, which was created by merging the categories of the variable general health. Considering the article (Jindrová & Labudová, 2020), we used the following explanatory indicators in the model: age, degree of urbanization, educational attainment level, equalized household disposable income, main activity status, marital status, severe material deprivation, and NUTS 3 region. The estimated parameters and odds ratios correspond to the model predicting the value of good health.

#### Acknowledgment

The paper was supported by a grant agency of the Ministry of Education, Science, Research and Sport of the Slovak Republic VEGA no. 1/0431/22 Implementation innovative approaches of modeling and managing risks in internal models of insurance companies in accordance with the Solvency II.

#### References

- Agresti, A. (2019). *An Introduction to Categorical Data Analysis*. New York: Wiley.
- Agresti, A., & Finlay, B. (2014). *Statistical Methods for the Social Sciences*. Pearson Education Limited.
- Allison, P. D. (2012). *Logistic Regression Using SAS. Theory and application*. USA: SAS Institute, Inc.
- Blaxter, M. (Ed.). (2004). *Health*. Cambridge: Polity Press.
- European Commission. (2021). *Methodological guidelines and descriptions of EU-SILC, target variables*. <https://ec.europa.eu/eurostat/documents/203647/203704/DOC65.pdf/434b2180-33b3-0d8c-ed1e-2da912d6a685?t=1655461990699>
- Hosmer, D. W., Lemeshow, S., & Sturdivant, R. X. (2013). Applied Logistic Regression. In *Wiley series in probability and statistics*. <https://doi.org/10.1002/9781118548387>
- Jindrová, P., & Labudová, V. (2020). The impact of socio-economic and demographic determinants on self-perceived health. *E+M. Ekonomie a Management*, 23(4), 68–88. <https://doi.org/10.15240/tul/001/2020-4-005>



- Manderbacka, K., Lundberg, O., & Martkainen, P. (1999). Do risk factors and health behaviours contribute to self-ratings of health? *Social Science & Medicine*, 48(12), 1713–1720. [https://doi.org/10.1016/S0277-9536\(99\)00068-4](https://doi.org/10.1016/S0277-9536(99)00068-4)
- Silva, J., Truzzi, A., Schaustz, F., De Barros, R. D., Santos, M., & Laks, J. (2017). Impact of insomnia on self-perceived health in the elderly. *Arquivos de Neuro-Psiquiatria*, 75(5), 277–281. <https://doi.org/10.1590/0004-282x20170031>
- Statistical Office of the Slovak Republic. (2020). *EU SILC 2019 Poverty Indicators and Social Exclusion (material deprivation)*. Bratislava: ŠÚ SR. [www.statistics.sk](http://www.statistics.sk)
- Whitehead, M., & Dahlgren, G. (2007). *European strategies for tackling social inequities in health: Levelling up Part 2*. Copenhagen: WHO Regional Office for Europe. [http://www.euro.who.int/\\_\\_data/assets/pdf\\_file/0018/103824/E89384.pdf](http://www.euro.who.int/__data/assets/pdf_file/0018/103824/E89384.pdf)
- World Health Organization. (1948). *Summary Reports on Proceedings Minutes and Final Acts of the International Health Conference held in New York from 19 June to 22 July 1946*. <https://apps.who.int/iris/handle/10665/85573>
- World Health Organization. (2018). *WHO Housing and Health Guidelines*. Geneva: World Health Organization. <https://iris.who.int/bitstream/handle/10665/276001/9789241550376-eng.pdf?sequence=1>





# From Awareness to Action: How Social Media Users Respond to Femicide Cases

Gjorgjina Sherovska<sup>1</sup> 

Received: June 22, 2023

Accepted: November 20, 2023

Published: March 16, 2024

## Keywords:

Femicide;  
Marketing;  
Social media marketing;  
Marketing culture



Creative Commons Non Commercial CC BY-NC: This article is distributed under the terms of the Creative Commons Attribution-Non-Commercial 4.0 License (<https://creativecommons.org/licenses/by-nc/4.0/>) which permits non-commercial use, reproduction and distribution of the work without further permission.

**Abstract:** Femicide is a grave violation of fundamental human rights, such as the right to life, liberty, and personal security, as well as a formidable hindrance to social and economic progress. By definition, femicide is the premeditated killing of a female person due to their gender. This phenomenon is the result of a multitude of risk factors at the individual, interpersonal, community, and societal levels. The magnitude of what has been dubbed the "shadow pandemic" is evidenced by the mounting violence inflicted on women. This research seeks to analyze the role of social media marketing in bringing awareness to the issue of femicide, namely, its effect on public opinion, the degree to which it increases awareness of the rising femicide rate, and the reactions of social media users when confronted with individual cases. To achieve this, a phenomenological study with a Likert scale was conducted, involving 100 participants in North Macedonia aged between 18 and 60. The findings indicate that the majority of respondents do not believe that social media provides an impetus for people to take action against femicide and their concerning note is witnessing online harassment or bullying related to femicide or violence against women on social media. Empowering the potential of creating a safe and supportive environment for discussing and addressing issues of femicide and violence against women in the social media space.

## 1. INTRODUCTION

In the context of the study by Ott (2018), feminist activism has cast renewed light on an extreme form of gender-based violence which has spiked in many countries even in places where there are laws against femicide. The role of social media in addressing femicide reveals the positive impacts of social media platforms as well as their negative effects in the war to combat femicide. Ott (2018), explains that the fight against femicide through social media has been achieved through the reinstatement of different factors that lead to the persistence of femicide. However, social media itself still harbors other unaddressed factors making it a contributing factor to the persistence of femicide. In this case, assessing social media with regard to femicide explores how different communities formed and interact in the social media spaces while gauging whether values expressed in the event align or misalign with the femicide ethical standards. Verkuyl (2020) explain that digital social media has invited participation based on values of collaboration, networking, and openness as an ethical way to align society with femicide values like inclusion, cooperation, and access. However, with advancements in technology, hence social media platforms, these platforms are not only shaped by the algorithms and business models behind them but as well as the material biases that users bring with them to the particular platforms. Moreover, the femicide internet behind different social media platforms majorly works towards empowering women and queering people from all diversities to have them enjoy their rights, and pleasure as well as dismantling the patriarchy. Through this, social media facilitates the integration of different contexts, specificity, and realities regardless of age, disabilities, gender, racial markers, ethical origin, sexuality, religious beliefs as well and socioeconomic location, Verkuyl (2020).

<sup>1</sup> SMX Academy, North Macedonia

## 2. LITERATURE REVIEW

The aspect of raising awareness in social media to address femicide portrays the positive side of social media which has been elaborated through fighting gender-based violence, social movement, intersection and empowerment of technology, and change of the users' conversation across different social media spaces, [Ott \(2018\)](#). Based on the study by [Nagarajan \(2016\)](#), different social media platforms have deployed mechanisms aimed at harnessing the power of the internet to convey the realities of women's lives across the world to empower freedom of gender and sexual expression in the communities. Additionally, initiatives like "Take Back The Tech" called for everyone particularly women and girls to rise and take control of technology to end violence against women. Such global campaigns and initiatives through social media aimed to highlight different tech-related violence against women as well as gathering research and solutions across the world, [Verkuyl \(2020\)](#). [Nagarajan \(2016\)](#), adds that with the advancement of technology, different social media platforms have incorporated tools oriented to support femicide ideas i.e. checking which gender dominates the conversation, checking on job advert biasing, and revealing the nature of languages used by the users across the platforms. This artifact enables social media to manage and change the users' conversations as one of the ways to control femicide. According to [Weiner \(2015\)](#), through social movements, social media has given women, activists as well and everyone the opportunity to connect as a virtual soapbox to ground up, make points, and spread out their message across different regions even when magazines and newspapers ignore their message. This is all achieved through the use of smartphones as one of the leading social movements towards rebuking femicide. Based on [Wallace \(2014\)](#), the intersection of technology and empowerment has been evident from the involvement and amendment of Cyber security policies across different social media platforms. In this case, monitoring the users' activities, connections, and comments across particular platforms has helped in revealing serious cases that could not be accessed- thanks to social media. Moreover, social media demonstrated a massive impact on galvanizing international outrage over horrific scenarios. This has all been achieved through the inclusion of Cyber security policies in promoting technological intersection in empowering the fight against femicide. Such policies protecting the community standards have put Cyber security at the forefront in fighting femicide by governing the nature of content and activities across particular sites, as well as monitoring, blocking, and filtering suspicious content/users from the platforms. Additionally, Cyber security has also helped play a part in investigations on matters associated with femicide ([Wallace, 2014](#)). Moreover, outlined policies governing the operation of particular social media platforms have been a key guidance in the process of empowering initiatives that are meant to change how femicide cases are reported as one of the ways to achieve extensive and effective societal change. This implies that concerned authorities that control the different social media spaces can either reinvent existing femicide control mechanisms or even leverage and apply existing frameworks in a manner that matches the femicide context as well as responding to the grievances from the anti-violence groups and movements as an approach to address right-based and gender-sensitive concerns in different regions, ([Wallace, 2014](#)).

Considering that one of the major goals of social media platforms is to connect people from different regions, spreading femicide cases has become easier due to the extensive outrage coverage from an international perspective. [Wallace \(2014\)](#) expounds that, apart from the possible virtual connection and interactions made possible by the social media space; social media has been key in extending such virtual connections to in-person meetups that empower femicide control based on proving wrong some of the existing beliefs that are seen to be promoting femicide. In addition, [Wallace \(2014\)](#) explains that since the basic objective of the existence of technology is to connect

people; hosting events like hackathons, webinars, and other events aimed at connecting people will largely help in accomplishing motives that empower femicide control in different regions. Despite the positive impacts of social media on femicide, social media still stands as a contributing factor to femicide through factors like gender-based violence, race, filtered data, and “openness”. Adapting from Wallace (2014), although technological innovations are paramount as well as significant from a technological advancement perspective, different technological innovations spike up a different social media shape. Based on the report by the United Nations Office on Drugs and Crime, the combination of mobile phones and online ads-related platforms has made it easier and faster for one to order a woman/girl than a pizza. Such social media platforms can be grouped under the inappropriate usage of social media which can promote femicide from the sale of women or the exchange of femicide-stimulating artifacts across particular sites. Generally, inappropriate usage of social media is a femicide-stimulating factor since it involves the spread of inappropriate content, inappropriate operations, and well as clouding individuals with inappropriate beliefs that tend to affect their behavior in their regions, Nagarajan (2016). Moreover, different social media platforms operate under different frameworks under the control of different personnel. This implies that having diversity from the operational nature of certain sites determines the likelihood of having certain content shared across as well as how reporting of femicide incidences is done. In this case, it is believed that within the social media space, not all social media platforms use the right channels and modes in reporting or addressing femicide cases. This challenge, therefore, affects how common users perceive the fight against femicide thus making it a challenge to combat femicide from a social media perspective, Ott (2018). Generally, Jacobson (2016) explains that the ratio at which social media is helping in fighting femicide is indirectly proportional to it serving in favor of stimulating femicide. This can be adapted from the fact that today peers observe the impossible standards set much closer to their homes not even by celebrities but by fellow friends or classmates. Such instance exerts some psychological pressure on the users, including vulnerability, the need for validation, and the desire to compare themselves with their friends or peers. In addition, different attitudes, behavior, and beliefs are ingrained in individual users regardless of age, gender, or race based on the type of social media platform, the associate users, and the trending conversation from the particular platforms, Marsh (2016). According to the study by Jacobson (2016), today the age bracket of users interacting with social media platforms includes a higher percentage of kids. This implies that kids are exposed to content that is beyond their age class. In this case, if the content is inclined towards encouraging femicide of any form in society, the kids are therefore likely to suffer from social media pressure that affects their belief on what is right and what is wrong in society, found Jacobson (2016). Social media may or may not be a stimulating factor in femicide based on the available social media platforms, the type of users available as well as the type of content trending from the social media platform, states Marsh (2016). Besides, with applicable laws and policies enforcement on the type and nature of content allowed in the social media spaces concerning the set community standards expectations, different social media platforms have been in a position to filter out toxic content, users as well as influential sites that are believed to be empowering femicide. Generally, social media plays both parts in either fighting femicide or promoting femicide regardless of the available enforced laws and regulations for the same, explains Powell (2018).

### 3. DISCUSSION OF RESULTS

This survey of 100 respondents in the Republic of North Macedonia aged between 18 and 60 conducted via a quantitative method of online questionnaire found that there was a relatively even split between male and female respondents. The largest age group was 35-44, and all

respondents had social media accounts. Facebook was the most popular social media site, followed by Instagram, Twitter, YouTube, Tiktok, and LinkedIn. Most respondents used social media for communication with friends, with smaller percentages using it for dating, meeting new people, following the latest news, training, or finding resources related to their studies or work. The majority of respondents spent between 2-5 hours on social media activities. All respondents somewhat agreed that they express themselves better on social media and that social media presents a different reality from the real world. Additionally, all respondents somewhat agreed that social media news can shape society's prejudices and discrimination, while 100% agreed that social media plays a role in raising awareness about femicide and impacting women's rights and gender equality. The respondents of the survey strongly agree that social media promotes a culture of violence against women and is a place where women are not treated with respect. They also agree that social media is known to be a place where women are bullied and harassed, and normalizes violent and abusive behavior towards women. However, the respondents neither agree nor disagree with the idea that social media allows for the easy dissemination of harmful and degrading content about women.

Furthermore, the respondents do not believe that social media provides a platform for victims of femicide to share their stories and seek justice. These findings suggest that there is a need for more measures to be taken to address the issue of violence against women on social media and to create safe spaces for women to share their experiences without fear of harassment or abuse. The majority of the respondents do not believe that social media encourages people to take action against femicide. However, all respondents strongly agree that social media can raise awareness about femicide and violence against women. Additionally, all respondents somewhat agree that social media can contribute to the normalization of violence against women or femicide. The respondents were unsure whether social media provides a space for women to organize and advocate for their rights. Moreover, all respondents somewhat agree that social media perpetuates harmful gender stereotypes that contribute to femicide. A majority of the respondents strongly believe that social media provides a platform for perpetrators of femicide to glorify their actions, and only a small percentage somewhat agrees with this. Finally, the vast majority of the respondents strongly disagree that social media has a positive impact on reducing femicide rates, while a small percentage strongly agrees with this statement. Overall, these results suggest that while social media can be a useful tool for raising awareness, it may also contribute to the normalization of harmful behavior and stereotypes, and it may not be an effective means of reducing femicide rates. The survey revealed that the majority of the respondents have come across news or information related to femicide or violence against women on social media. A significant number of respondents believe that social media campaigns and movements against femicide or violence encourage them to take action or raise awareness about the issue. More than half of the respondents think that social media platforms have a responsibility to take action against content that promotes or glorifies femicide or violence against women. It is concerning to note that a large percentage of respondents have witnessed online harassment or bullying related to femicide or violence against women on social media. These findings highlight the need for increased awareness and action against violence against women on social media. 94 out of 100, believe that social media can play a positive role in the fight against violence against women. However, 6 out of 100 respondents disagreed with this statement. When asked whether social media companies should be held accountable for content related to femicide and violence against women, 54% of respondents answered in the affirmative, while 46% answered negatively. This indicates that there is a division among people on whether social media companies should be responsible for their platform's content related to this critical issue.

## 4. CONCLUSION

In conclusion, this survey highlights the complex and multifaceted nature of social media's impact on women's rights and gender equality. While respondents acknowledged the potential of social media to raise awareness about femicide and promote gender equality, they also highlighted the platform's problematic aspects, such as the normalization of violence and abuse against women, cyberbullying, and the perpetuation of harmful stereotypes. The finding that respondents expressed themselves better on social media than in real life suggests that social media provides a sense of anonymity and distance that can be both empowering and problematic. On the one hand, this anonymity can be used to speak out against injustices and raise awareness about important issues. On the other hand, it can also contribute to the dissemination of harmful and degrading content about women, and allow for the perpetuation of discriminatory attitudes and behaviors. Given these findings, it is clear that social media companies have a responsibility to actively address the issue of violence against women and gender inequality on their platforms. This can be achieved through the implementation of stricter content moderation policies, the promotion of positive and inclusive messaging, and the development of educational programs to raise awareness about these issues among users. Moreover, individuals need to recognize their role in shaping social media's impact on women's rights and gender equality. By actively engaging in conversations and actions that promote equality and respect for women on social media, users can contribute to creating a more inclusive and safe online environment for all. In conclusion, the survey results highlight the alarming impact of social media on the issue of femicide and violence against women. The majority of respondents believe that social media perpetuates harmful gender stereotypes, provides a platform for perpetrators to glorify their actions, and has no positive impact on reducing femicide rates. However, it is encouraging to note that social media campaigns and movements against femicide or violence are effective in raising awareness and encouraging action against the issue. The fact that a large percentage of respondents have witnessed online harassment or bullying related to femicide or violence against women on social media is particularly troubling. In light of these findings, social media platforms need to prioritize the issue of femicide and violence against women by taking concrete measures to combat harmful content and online harassment. Governments and civil society organizations can also play a critical role in raising awareness and advocating for action to address this pressing issue. It is only through concerted efforts from all stakeholders that we can hope to make progress towards a safer and more equitable society for women.

## 5. FUTURE RESEARCH DIRECTIONS

While femicide has been a long-standing problem in many parts of the world, emerging trends suggest that it is on the rise in some countries due to factors such as the proliferation of firearms, domestic violence, and patriarchal attitudes. In terms of social media marketing, several emerging trends are likely to shape the industry's future. One of the most notable trends is the increasing use of artificial intelligence and machine learning algorithms to analyze customer data and personalize marketing strategies. Another emerging trend is the growing importance of influencer marketing. As social media platforms continue to gain popularity, influencers with large followings can have a significant impact on consumer behavior. Finally, there is a growing emphasis on social responsibility and ethical marketing practices. Consumers are increasingly concerned about issues such as sustainability, diversity, and inclusivity, and they expect brands to align with their values. As a result, social media marketers are likely to face increasing pressure to adopt more socially responsible practices, such as promoting sustainable products and

avoiding harmful or offensive content. Several potential research directions could be pursued in the intersection of femicide and social media marketing. Future research could examine how social media marketing campaigns address the issue of femicide, and what messages they convey to the public. This could involve analyzing the use of imagery, language, and storytelling techniques, as well as evaluating the impact of these campaigns on attitudes and behaviors related to femicide. Another interesting future research direction would be that researchers can investigate how women are represented in social media marketing and how this representation may contribute to the normalization of violence against women. This can include analyzing the use of gender stereotypes and sexualization in marketing campaigns and how they may impact attitudes toward women.

## References

- Jacobson, R. (2016). Social Media and Self-Doubt. Child Mind Institute. Retrieved from <https://childmind.org/article/social-media-and-self-doubt/>
- Marsh, S. (2016, September 1). Young women – do you feel the pressure to be perfect? The Guardian. Retrieved from <https://www.theguardian.com/commentisfree/2016/sep/01/young-women-pressure-perfect-education-looks-work-relationships-social-media>
- Nagarajan, C. (2016, September 12). What does a feminist internet look like? The Guardian. Retrieved from <https://www.theguardian.com/commentisfree/2016/sep/12/feminist-internet-empowering-online-harassment>
- Ott, K. (2018). Social Media and Feminist Values: Aligned or Maligned? *Frontiers: A Journal of Women Studies*, 39(1), 93-111. Retrieved from <https://muse.jhu.edu/article/690811/pdf>
- Powell, C. (2018). How Social Media has Reshaped Feminism. Council on Foreign Relations. Retrieved from <https://www.cfr.org/blog/how-social-media-has-reshaped-feminism>
- Verkuyl, G. (2020). Impact of Social Media on Feminism. *Gender & Sexuality Studies Student Work Collection*, 57. Retrieved from [https://digitalcommons.tacoma.uw.edu/gender\\_studies/57](https://digitalcommons.tacoma.uw.edu/gender_studies/57)
- Wallace, K. (2014). Technology is feminism's friend and foe. CNN. Retrieved from <https://www.cnn.com/2014/03/18/living/technology-empowering-women-identity/index.html>
- Weiner, J. (2015). The Pressure to Look Good. *The New York Times*. Retrieved from <https://www.nytimes.com/2015/05/31/opinion/sunday/jennifer-weiner-the-pressure-to-lookgood.html>. [Source: <https://studycrumb.com/alphabetizer>]





# Determining the Correlation between the RLAH Regime and Roaming Usage by Applying Business Intelligence

Lovre Dodig<sup>1</sup>   
Ljerka Luic<sup>2</sup> 

Received: August 29, 2023  
Accepted: November 29, 2023  
Published: March 16, 2024

## Keywords:

Roaming like at home;  
Mobile services;  
Croatian mobile users;  
Big data;  
Business intelligence



Creative Commons Non Commercial CC BY-NC: This article is distributed under the terms of the Creative Commons Attribution-Non-Commercial 4.0 License (<https://creativecommons.org/licenses/by-nc/4.0/>) which permits non-commercial use, reproduction and distribution of the work without further permission.

**Abstract:** *Roaming like at home (RLAH) regime came into force on June 15, 2017, and marked the beginning of more accessible communication and use of mobile services without additional fees when travelling within the EU. In this context, this paper analyses the correlation between RLAH and the intensity of the use of mobile services by Croatian users in EU Roaming. In this regard, the research aims to measure how much RLAH influenced Croatian users' greater use of mobile services in EU roaming. How many Croatian users used mobile services in EU roaming before RLAH and during RLAH, and to what extent Croatian users in EU roaming used mobile services before the introduction of the RLAH regime compared to the period after the introduction of RLAH are questions that determine the framework research problems. This research used aggregated data on users and the use of mobile voice services of Croatian users in the EU roaming from HAKOM's (Croatian regulatory authority for network industries) database. The period observed is between Q1 2014 and Q2 2022. The research was carried out by business intelligence concepts and tools and elaborated with descriptive statistics method. Based on the results obtained from the research, the hypothesis that RLAH stimulated the use of mobile services by Croatian users in EU roaming can be confirmed. In this regard, this work supports the set goals of developing the EU digital single market and opens up space for additional research to examine user habits as part of forming a single internal market.*

## 1. INTRODUCTION

One of the greatest and most important successes of the European Union (EU) is the creation of a single internal market. The idea of a single market was born in 1993, and since then, it has been the backbone of the EU that facilitates the daily life of European citizens and businesses (European Commission, 2023a). Moreover, the continuous increase in integration between European countries and the increased prosperity of citizens has led to increased travel, before the COVID-19 pandemic, within Europe (Eurostat, 2023). However, using mobile services during travel was not easy, as it was known to cause high and unexpected costs. Due to strong globalization, which has changed how we live, and the advancement of technology, the desire for "connection" while travelling has become more significant.

Using a mobile phone with a national network operator abroad is called roaming. In technical terms, roaming is when a national network operator cannot rely on its own network infrastructure for voice or data transmission but must use the operator's network in the visited country. Thus, the local operator will pay a wholesale fee for using the visited operator's network and then transfer this fee in the retail tariff to the end user who travelled. Given that the wholesale prices between operators, if not negotiated low, are often high internationally, consequently, the retail prices paid by the end user are also high. Because of this business approach, end users have the habit of turning off their mobile phones when travelling to avoid shocks on their bills.

<sup>1</sup> University North, Trg dr. Žarka Dolinara 1, 48000 Koprivnica, Croatia

<sup>2</sup> University North, Trg dr. Žarka Dolinara 1, 48000 Koprivnica, Croatia

Moreover, such an approach by end users ultimately harmed the telecom operators themselves, whose users did not bring them additional revenue through the potential use of mobile services in roaming. Also, the high price of roaming, in general, harms both the economy and the business world; this was indicated, among other things, by Neelie Kroes (European Commissioner for the Digital Agenda, 2010-2014): "It's not just a fight between holiday-makers and telecoms companies. Millions of businesses face extra costs because of roaming, and companies like app makers lose revenue, too. Roaming makes no sense in a single market – it is economic madness" (European Commission, 2014).

However, as of June 15, 2017, this is no longer the case in the European Economic Area (EEA). Namely, in June 2017, roaming regulation ("EUR-LEX - 32015R2120 - EN - EUR-LEX," 2015) entered into force and introduced Roaming – like -at – home (RLAH) regime, according to which retail roaming prices have been abolished. This way, EU citizens travelling from their country to another EU country do not have to pay additional fees to use their mobile phones. According to the European Commission (n.d.), RLAH is using a mobile phone on occasional trips outside the country where you live or with which you have strong ties, i.e. where you work or study. As long as you spend more time in that country than abroad or use your mobile phone there more often, you are considered to be roaming when you use it abroad. Then, you will pay for using your phone according to domestic tariffs for calls, text messages and data usage in the EU. This is considered a fair use of roaming services.

Given that the Republic of Croatia became a full member of the EU on July 1, 2013, and entirely became part of the single European market, the roaming regulation presented by RLAH also applies to it. In this regard, this paper investigates to what extent the RLAH regime contributed to the use of mobile services by Croatian users in EU/EEA countries. The correlation was determined based on data on the use of mobile services before the RLAH regime and after the RLAH regime, i.e. after the RLAH came into force in July 2017.

## 2. METHODOLOGY

The research was carried out using the method of data analysis on the use of mobile services by Croatian users in the EU/EEA countries in the period between Q1 2014 and Q2 2022. As a data source, aggregated data from the Croatian Regulatory Agency for Network Activities (HAKOM) database was used.

As stated, the research is limited to Croatian users because HAKOM collects data only from Croatian telecom operators. MS Excel and Power BI tools were used to process the collected data. Therefore, the first step was to collect data from the HAKOM database. The second step was to process the data in MS EXCEL and POWER BI, which resulted in graphical representations.

The frequency of use of mobile services by Croatian users in the EU/EEA area in the observed period was measured by looking at data on the use of voice mobile services by Croatian users. Specifically, the processed data related to the total number of minutes Croatian users spent during their trip to the EU/EEA countries. Likewise, for the purposes of this research, the minutes of conversations made by Croatian users through incoming calls, i.e. minutes received, were processed.

Therefore, the focus of the research was on the number of minutes of Croatian users in the period when the RLAH regime did not exist and the period after the RLAH came into force, that is, on the trend of minutes of conversation phone calls by Croatian users in that period. Furthermore, we highlight the following conclusions.

### 3. RESULTS

The results represent the correlation between the entry into force of the RLAH regime and the use of mobile services by Croatian users of mobile services in EU/EEA countries before June 15, 2017, and after. The total research period covered is 97 months.

#### 3.1. Croatian Users' Calls Made in EU/EEA While Roaming

Figure 1 shows the total number of minutes made by Croatian users in the observed period, i.e. from Q1 2014 to Q2 2022. It is visible that the number of minutes is continuously growing, which justifies the fact and data stated in the introduction of this paper and the continuous increase in travel between EU member states/ EEA. However, from the attached graph 1, it is evident that since Q2 2017, the number of minutes of Croatian users in EU/EEA countries has grown exponentially. More specifically, the RLAH regime came into force on June 15, 2017, i.e. at the end of the second quarter of 2017. In this regard, the graph shows that the number of minutes between the second and third quarters of 2017 grew by as much as 166% and between the second quarter of 2017 and the second quarter of 2018 by 325%. Comparing the complete period before the RLAH, i.e. the third quarter of 2016, and the period when the RLAH fully came into effect (Q3 2017), an increase of 367% can be seen.

In 2019, traffic peaked just before the COVID-19 pandemic, which slowed down tourism as well (European Commission, 2023b). COVID-19 significantly impacted the entire world economy, including tourism, so the consequences are felt today, and tourism has yet to return to pre-pandemic figures. However, during and after the pandemic, a significant impact of RLAH on the use of mobile networks by Croatian users in EU/EEA countries can be seen.

Overall, from the beginning of the observed period in the first quarter of 2014 to the end of the observed period, i.e. the second quarter of 2022, Croatian users in EU/EEA roaming had as many as 75 million more minutes, or an increase of 1418%.

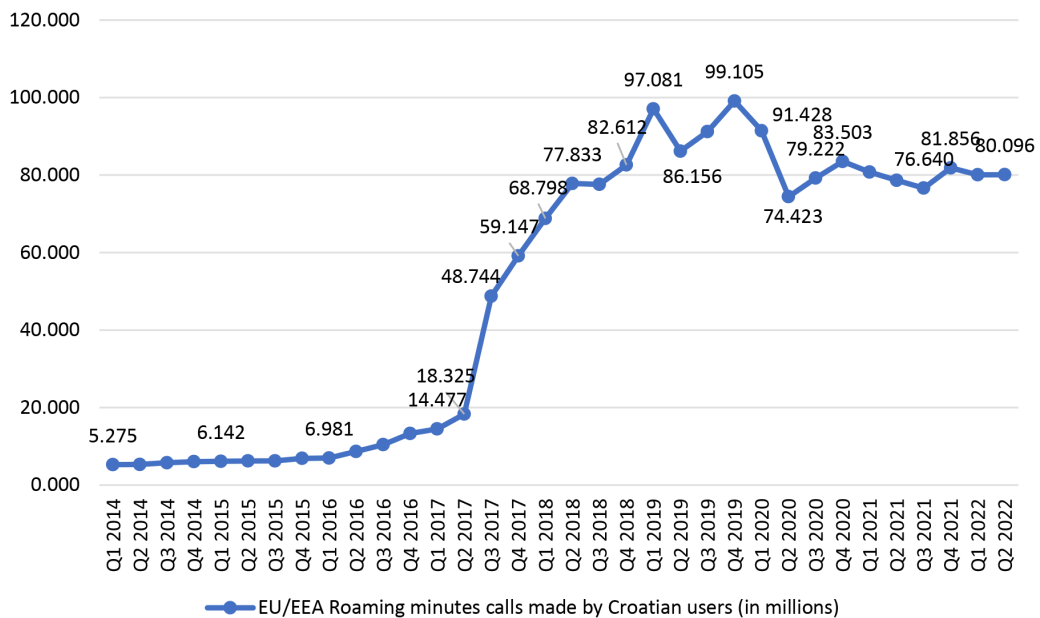


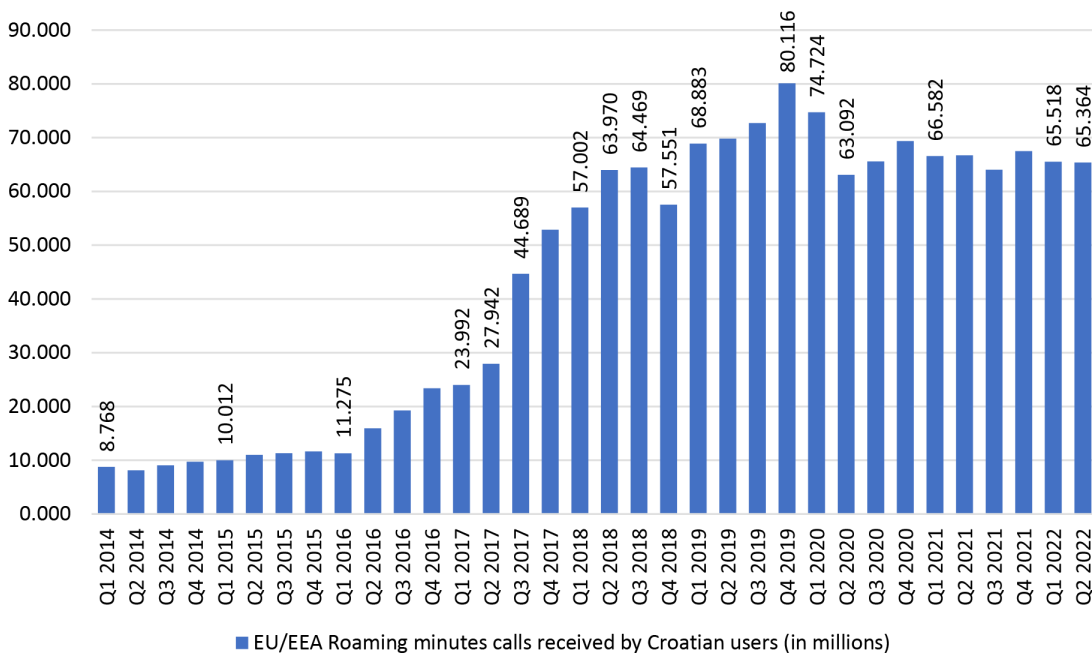
Figure 1. EU/EEA Roaming minutes - Calls made by Croatian users (in millions)

Source: Authors

### 3.2. Croatian Users' Calls Received in EU/EEA While Roaming

Similar results can be seen on more inverted data. Figure 2 shows the number of incoming minutes to mobile phones of Croatian users in EU/EEA roaming. The number of received minutes is continuously increasing. However, it is growing exponentially with the entry into force of the RLAH regime from the second and third quarters of 2017. As in the previous graph, it is also evident that the highest number of minutes was recorded in the fourth quarter of 2019, just before the COVID-19 pandemic.

The growth of incoming minutes between the second and third quarters of 2017 is 60%, which is less than outgoing minutes but can also be attributed to users who are roaming do not have complete control over incoming minutes, considering that it is an incoming call. However, considering the high growth, users are still more inclined to respond after June 15, 2017, than before. In the total observed period, the number of minutes from the first quarter of 2014 to the second quarter of 2022 recorded a total of 646% growth.



**Figure 2.** EU/EEA Roaming minutes - Calls received by Croatian users (in millions)

Source: Authors

### 4. FUTURE RESEARCH DIRECTIONS

Roaming regulation and the RLAH regime have been extended from July 1, 2022, for another ten years, i.e. until July 2023. During this period, mobile roaming services in the EU/EEA area will continue to be intensively used because the pandemic is over, and travel should return to the pre-pandemic growth curve. Also, new trends such as teleworking and digital nomads have appeared, which can undoubtedly greatly influence the increase in demand for RLAH.

On the other hand, this research was limited exclusively to Croatian users and mobile call services (minutes). The research can be extended to other EU/EEA member states and mobile services, especially roaming data services. Namely, data services are certainly the most sought-after and used mobile services today.

## 5. CONCLUSION

Roaming in the EU has gone through numerous regulation processes since 2007, primarily through the setting of caps at both wholesale and retail levels. The European Commission has succeeded in its goal as part of the single internal market to enable RLAH on its territory, and this is confirmed by the fact that in 2022, a new roaming regulation was voted on that extends RLAH until 2032 (European Commission, 2022).

The RLAH regime has ultimately brought a new dimension of communication when European citizens travel within the EU/EEA. Since June 2017, the barriers have been broken down, and now all EU citizens can use their mobile services freely when they travel. In this paper, we saw how the introduction of RLAH concretely affected the use of mobile services by Croatian users in EU roaming. It is evident from the results that the abolishment of retail charges for communication in roaming led to an exponential growth in the use of mobile services during travel. In this regard, this paper confirms a strong correlation between RLAH and Croatian users' use of mobile services in roaming.

### Acknowledgment

Publication of this paper was supported by mentors and PhD students grant from the University North and HAKOM to which the authors of this article are grateful for the big support.

### References

- EUR-LEX - 32015R2120 - EN - EUR-LEX. (2015, October). Retrieved August 29, 2023, from <http://data.europa.eu/eli/reg/2015/2120/oj>
- European Commission. (n.d.). *Roaming: Upotreba mobilnog telefona u EU-u*. Europa. Retrieved August 27, 2023, from [https://europa.eu/youreurope/citizens/consumers/internet-telecoms/mobile-roaming-costs/index\\_hr.htm](https://europa.eu/youreurope/citizens/consumers/internet-telecoms/mobile-roaming-costs/index_hr.htm)
- European Commission. (2014, February 17). *Roaming: 300 million extra customers for telecoms companies when roaming charges end, survey shows*. Europa. Retrieved August 27, 2023, from [https://ec.europa.eu/commission/presscorner/detail/en/IP\\_14\\_152](https://ec.europa.eu/commission/presscorner/detail/en/IP_14_152)
- European Commission. (2022, June 30). *New roaming regulation*. Europa. Retrieved August 23, 2023, from [https://ec.europa.eu/commission/presscorner/detail/en/IP\\_22\\_4198](https://ec.europa.eu/commission/presscorner/detail/en/IP_22_4198)
- European Commission. (2023a). *In 2023, Europe's single market turns 30!* Europa. Retrieved August 18, 2023, from [https://single-market-economy.ec.europa.eu/single-market/30th-anniversary\\_en](https://single-market-economy.ec.europa.eu/single-market/30th-anniversary_en)
- European Commission. (2023b, March 15). *EU tourism nights recovered to 95% of 2019 level*. Europa. Retrieved August 27, 2023, from <https://ec.europa.eu/eurostat/web/products-eurostat-news/w/ddn-20230315-1>
- Eurostat. (2023, August 27). *Monthly nights spent at tourist accommodation establishments*. Europa. Retrieved August 27, 2023, from <https://ec.europa.eu/eurostat/web/tourism/visualisations>





# Identification and Role of Ethical Consumer Behaviour in the Overall Marketing Strategy

Nadezhda Dimova<sup>1</sup> 

Received: July 17, 2023

Accepted: November 6, 2023

Published: March 16, 2024

## Keywords:

Marketing strategy;  
Ethical consumer behavior;  
Market;  
Identification



Creative Commons Non Commercial CC BY-NC: This article is distributed under the terms of the Creative Commons Attribution-Non-Commercial 4.0 License (<https://creativecommons.org/licenses/by-nc/4.0/>) which permits non-commercial use, reproduction and distribution of the work without further permission.

**Abstract:** *The success of a modern marketing strategy largely depends on taking into account the changes and dynamics of consumer behavior. Crucial to this reporting is identifying ethical consumer behavior and distinguishing it from unethical consumer behavior.*

*Marketing managers should monitor the ever-increasing intensity of changes in consumer behavior, especially those that reflect the creation of unethical behavior. This process is two-way, and in many cases, changes in marketing strategy influence consumer choices and whether to be ethical or unethical, because companies themselves can be ethical.*

## 1. INTRODUCTION

Realizing the goals of the modern economic world puts companies and consumers in front of many choices that reflect a number of socio-psychological and ethical problems. The influence of digital technologies also predetermines the real well-being of users in various aspects - physical and emotional. More specifically, in the optimal functioning and experience of users, social connectedness, self-esteem and empathy are threatened in the digital world through the excessive consumption of digital technologies.

The purpose of the report is to identify the role of ethical consumer behavior in the overall marketing strategy. The research methodology is related to comparative analysis and tracking the development of the various stages of ethical and unethical consumer behavior in the conditions of digitalization. The author's thesis is related to the fact that the problems of ethical consumer behavior, in general, are neglected in the formation of the marketing strategy.

The Internet is a widely used medium to interact and communicate with others and to access information, knowledge and services anytime, anywhere. Recent advances in information and communication technology (ICT) such as online social networking and mobile technology have greatly increased and expanded Internet use. While the Internet provides many benefits to individuals and societies, it also has the potential to promote and exacerbate problems (Lin et al., 2022).

For example, ethical issues easily arise through the ability of Internet users to rapidly distribute user-generated content, access online content, and anonymize their online presence (Yoon, 2011). Ethical issues and problems related to the Internet as significantly negative impacts on consumers and society from the spread of negativity targeting certain individuals or groups has attracted increasing research attention in recent years (Karim et al., 2009; Yoon, 2011).

<sup>1</sup> New Bulgarian University, 21 Montevideo Blvd., 1618 Sofia, Bulgaria

Market participants consider ethical behavior to be an indispensable component of mutually satisfying exchange relationships (Berry & Seiders, 2008).

Existing research, however, primarily views the market as a one-way relationship, focusing on the firm's ethics and behavior toward consumers (Aggarwal & Larrick, 2012). Or, marketing research suggests that companies have the sole power to set prices and create service policies (eg returns) with little input from consumers (Wirtz & McColl-Kennedy, 2010). Modern technology gives consumers the opportunity and greater power to create more balanced relationships. This sometimes predetermines the unethical behavior of users.

One of the main concerns in business ethics is whether the market competition brought about by globalization will lead to more shady business behavior (Brass et al., 1998; Chonko & Hunt, 1985; Stead & Gilbert, 2001; Trevino et al., 1999).

It is digital technologies that facilitate the communication process between consumers and suppliers, but this also contributes to new opportunities for creating unethical business (Babakus et al., 2004).

Electronic services themselves are online interactive services, provided to customers through the use of modern telecommunications, information and multimedia technologies (Boyer et al., 2002; Roth & Menor, 2003; Zemke & Connellan, 2000).

For the purpose of the present study, we will examine precisely the various problems of ethical and unethical consumer behavior in the conditions of digitalization.

## **2. ETHICAL AND UNETHICAL CONSUMER BEHAVIOUR**

In the specialized literature that is related to this issue, the emphasis in most cases is on the ethical challenges caused by the use of digital technologies, through which potential users are attracted.

Some of the major issues are related to misdirected marketing practices as well as misuse of customer transaction information or e-service by providers (Barclay, et al., 2003; Maury & Kleiner, 2002).

In a practical context, the collected information that is provided on the Internet does not always correspond to the actual one in the presentation of the products and services. In reality, in many cases, the information collected through e-commerce is not stored or used in a proper way, which in most cases leads to the violation of the confidentiality of the information. Some users simply download or transfer paid information services to other ones and in reality the latter do not pay a price, or if they do, it is minimal. In fact, this is a violation of copyright laws and thus violates the contract between customers and electronic service providers.

In the specialized literature, exchange relations are not always described in detail, especially when it comes to unethical behavior practiced by e-service providers and users, respectively.

In subordination to the investigated problem, the research hypothesis should be considered from several points of view. On the one hand, e-service providers apply unethical means when



concluding contracts with customers and are not always sympathetic to them. Due to the consistency of their behavior, these companies tend to take stricter measures to prevent possible breach of contract by customers because they have practiced unethical marketing measures.

On the other hand, some electronic service providers who have acted unethically may be very lenient in their treatment of customers who breach their contracts. This leniency is consistent with the concept of ethical reciprocity and can be seen as a form of compensation offered by e-service providers to compensate for their previous unethical behavior (Fehr & Gächter, 2003).

Most companies involved in e-commerce are focused on the possibilities of doing business on the Internet but do not always consider ethical issues towards consumers. Many researchers debate to what extent attention is paid to business ethics, and all of them are adamant that not much attention is paid to these ethics in practice (Maury & Kleiner, 2002; Stead & Gilbert, 2001).

In general, scholars agree that ethical principles in online and offline commerce are fundamentally the same, but may have different manifestations in some specific areas (Beltramini, 2003; Maury & Kleiner, 2002). These differences include issues of digital privacy, copyright, and unethical marketing practices in online commerce (Sarathy & Robertson, 2002; Stead & Gilbert, 2001).

The problem of unethical pre-contractual behavior and attitudes of e-service providers is still not receiving much attention (Cho et al., 2009). After the introduction of GDPR, the situation has changed a lot. All business actors must comply with the use of user data.

### 3. CONCLUSION

In conclusion, digitalization gives free choice to both companies and consumers to be ethical or unethical. Precisely the specific situations in business it is those who challenge each party to make their decision, bearing in mind the consequences afterward.

In practice, the making of flexible management decisions by managers in companies and the most satisfying consumer decisions are those that will allow the correct and expedient application of digital technologies to help companies and consumers themselves, reaching ethical behavior that in most cases is correct and especially important for the correct implementation of marketing strategies.

### References

- Aggarwal, P., & Larrick, R. (2012). When consumers care about being treated fairly: The interaction of relationship norms and fairness norms. *Journal of Consumer Psychology*, 22(1), 114-127.
- Babakus, E., Beinstock, C. C., & Van Scotter, J. R. (2004). Linking perceived quality and customer satisfaction to store traffic and revenue growth. *Decision Sciences*, 35(4), 713-737.
- Barclay, J., et al. (2003). Business ethics and the transitional economy: A tale of two modernities. *Journal of Business Ethics*, 46(2), 257-268.
- Beltramini, R. F. (2003). Application of the unfairness doctrine to marketing communications on the internet. *Journal of Business Ethics*, 42(4), 393-410.
- Berry, L., & Seiders, K. (2008). Serving unfair customers. *Business Horizons*, 51(1), 29-37.

- Boyer, K. K., Hallowell, R., & Roth, A. V. (2002). E-services: Operations strategy-A case study and a method for analyzing operational benefits. *Journal of Operations Management*, 20(2), 175–188.
- Brass, D. J., Butterfield, K. D., & Skaggs, B. C. (1998). Relationships and unethical behavior: A social network perspective. *Academy of Management Review*, 23(1), 14–31.
- Cho, V., Hung, H., & Wong, Y. (2009). Ethical reciprocity in digitalized transactions: An empirical study of pre- and post-contractual behavior. *Computers in Human Behavior*.
- Chonko, L. B., & Hunt, S. D. (1985). Ethics and marketing management: An empirical examination. *Journal of Business Research*, 13, 339–359.
- Fehr, E., & Gächter, S. (2003). Fairness and retaliation: The economics of reciprocity. In C. Camerer, G. Lowenstein, M. Rabin (Eds.), *Advances in Behavioral Economics*.
- Karim, N. S. A., Zamzuri, N. H. A., & Nor, Y. M. (2009). Exploring the relationship between Internet ethics in university students and the big five model of personality. *Computers & Education*, 53, 86–93.
- Lin, G. Y., Tseng, T. H., Yeh, C. H., Wang, Y. M., Wang, Y. Y., & Wang, Y. S. (2022). Development and validation of an internet unethical behavior scale. *Library & Information Science Research*, 44(2).
- Maury, M. D., & Kleiner, D. S. (2002). E-commerce, ethical commerce? *Journal of Business Ethics*, 36(1/2), 21–31.
- Roth, A. V., & Menor, L. J. (2003). Insights into service operations management: A research agenda. *Production and Operations Management*, 12(2), 145–164.
- Sarathy, R., & Robertson, C. (2002). Strategic and ethical considerations in managing digital privacy. *Journal of Business Ethics*, 46(2).
- Stead, B. A., & Gilbert, J. (2001). Ethical issues in electronic commerce. *Journal of Business Ethics*, 34(2, 2), 75–85.
- Trevino, L. K., Weaver, G. R., Gibson, D. G., & Toffler, B. L. (1999). Managing ethics and legal compliance: What works and what hurts. *California Management Review*, 41(2), 131–150.
- Wirtz, J., & McColl-Kennedy, J. (2010). Opportunistic customer claiming during service recovery. *Journal of the Academy of Marketing Science*, 38, 645–675.
- Yoon, C. (2011). Ethical decision-making in the Internet context: Development and test of an initial model based on moral philosophy. *Computers in Human Behavior*, 27, 2401–2409.
- Zemke, R., & Connellan, T. (2000). *E-service: 24 ways to keep your customers - When the competition is just a click away*. New York, NY: AMACOM.



# Impact of the Country of Origin on Pharmaceutical Products in the Albanian Market

Irma Shyle<sup>1</sup> 

Received: June 19, 2023

Accepted: February 26, 2024

Published: March 16, 2024

## Keywords:

Country of origin;  
Purchase decision;  
Pharmaceutical industry;  
Quality;  
Albania



Creative Commons Non Commercial CC BY-NC: This article is distributed under the terms of the Creative Commons Attribution-Non-Commercial 4.0 License (<https://creativecommons.org/licenses/by-nc/4.0/>) which permits non-commercial use, reproduction and distribution of the work without further permission.

**Abstract:** *Country image is essential as a country of origin information in marketplaces, especially for pharmaceutical products in developing countries. The origin of the products is used as a surrogate indicator for quality and safety. The pharmaceutical sector in Albania continues to be a developing sector, yet, locally produced products, while growing recently, continue to occupy and supply a small share of the total market. Imports dominate the Albanian drug market, and the country's most notable international brands exist. The study aimed to analyze the impact of the country of origin on the decision to purchase medications from the pharmaceutical sector in Albania and also to highlight the most critical factors affecting the impact of the country of origin on the choice of pharmaceutical products. Two hundred pharmacists, doctors, and chemists participated in the study. The results show that the country of origin is essential in assisting pharmacists in purchasing. The pharmacist's decision is driven mainly by the higher customer demand to purchase the country of origin attribute due to their low information on the product. The latter leads to selecting the best and most effective medications from countries perceived to have high quality.*

## 1. INTRODUCTION

In the selection process, consumers are focused not only on the price and quality but also on other factors such as the country of origin. Studies have shown that the “Made in” label is very important for the consumer when evaluating products. Consumers may use a country’s reputation to predict the quality of products (Lusk et al., 2006; Dawar & Parker, 1994; Aichner et al., 2017).

The definition of the country of origin has several influential variables on consumer behavior and consumer perception of product quality. Although we are aware that a product does not belong to a particular country only, because there are factors and resources, international supplies that take part in its production, again we accept that a product is identified with that of the country of production (Sivakumar, 2009).

Apart from the well-known fact that the country of origin is the country where a certain product or brand is produced, there are different definitions in different literature. Hence, the country of origin is the photo, reputation, or stereotype that businessmen or consumers attach to the products of a particular country (Nagashima, 1970); the country of the headquarters of the company dealing with the marketing of the product or brand (Johansson et al., 1985); the country of production or the country of assemblage (Al-Sulaiti & Baker, 1998); the factor that reflects a general consumer perception of the quality of products made in a given country and the nature of the people from that country (Knight & Calantone, 2000); the country of design, the country of assemblage and the country of constituent parts (Insch & McBride, 2004).

<sup>1</sup> Polytechnic University of Tirana, Department of Production and Management, Tirana, Albania

Due to globalization, many companies located in developing countries have started to relocate their production bases to developing countries for cheaper production costs using raw materials and labor in the country. Companies are now using more than one country to produce their goods. [Fournier \(1998\)](#) declared that country of origin relates a product to national identity, which can result in a strong emotional connection to certain brands and products.

Pharmaceutical products are products, and drugs that are used for diagnosis, cure, treatment and prevention of various human diseases. Pharmaceutical products concerning the impact that country of origin has, are the least studied products in Albania. Exactly this study aims to determine the level of influence of the country of origin factor on pharmacies and consumers in the process of selecting pharmaceutical products. What is the “country of origin” of a pharmaceutical product? Companies that manufacture medicines and medical devices deal with this question whenever they name a product, import it, export it, trade it, or sell it to the relevant government of a given state. The origin of a product is apparent when all the materials and labor used to produce a product originate in one country. However, this is not economically feasible or even possible. Although there are numerous studies in the field of medicine and pharmaceuticals, studies on the impact that the country of origin has in this field are lacking. For this reason, the literature on this is not very extensive. In fact, the “manufacturer’s place of business” is often located in a country that is different from the “country of origin” marked in order to have all the information about the product. According to FDA (Food and Drug Administration) regulations: If a person manufactures, packs, or distributes a drug product in a country other than their principal place of business, the label may state the principal place of business instead of the actual country where a drug or drug product is either manufactured or packaged or distributed, otherwise it would be misleading. According to [Aaker \(1996\)](#), a product’s country-of-origin image influences the product’s perceived quality, affecting perceptions about functional attributes, such as reliability, safety, or performance as well as the brand image of the product.

In 2018, Albania had an average of 86 pharmacists per 100 thousand inhabitants, 2 more than the average of European Union countries, according to data on the number of pharmacists by the order of Pharmacists and INSTAT for the population ([INSTAT 2018](#)). Imports dominate the Albanian drug market and most of the major international brands are present in the country. Locally produced products, while growing recently, continue to occupy and supply a small share of the total market. In 2018, domestic production accounted for about 10% of the market and imports for pharmaceutical products, amounted to \$ 220 million.

## 2. LITERATURE REVIEW

The information about the country of origin is used by consumers in order to evaluate products and their quality. Many consumers think that the “Made in” label means that a product is either “superior” or “inferior” depending on the perception of the country ([Mohd Yasin et al., 2007](#)). Meanwhile, further research suggests that the country of origin has symbolic and emotional meaning for consumers and may be related to feelings of national identity. The country of origin of the products is an influential factor in consumer perceptions and this in turn leads consumers to cognitive processing ([Pappu et al., 2006](#)). Studies reveal that consumers view products coming from underdeveloped countries with indifference ([Lee & Lee, 2009](#)). Products from countries with a favorable image usually reveal that they are more easily accepted than products from countries with a less favorable image ([Mohd Yasin et al., 2007](#)). Meanwhile, the findings further revealed that when consumers are unfamiliar with a country’s product, they will use the

country's image as a product rating. This assumes that consumers' product perception derives from beliefs and perceptions about the country from which a product originates. If the perceived country image of the country of production is perceived negatively, then there will be a negative impact on brand trust (Vo et al., 2022). Kumura and Canhua (2010) found that the image of the country is one of the most important phenomena that affects the ratings of foreign products as well. Consumers are constantly dealing with a variety of product information that they receive through branding, packaging, advertising and other channels (Ahmed et al., 2005). Yagci (2001) suggested that if a consumer is aware of a country's image of a product, the image will be used to generate a match between the country and the product category. A consumer who does not have concrete information about a product will use the image of the country to perceive the quality of a product (Ahmed et al., 2005). Consumers generally base their views on product brands and attributes as a result of the image of the country of origin of these products (Trang et al., 2013). The country of origin plays an important role with regard to product evaluation by consumers (Tung, 2012). Vo et al. (2022) in their study have a purpose to assess the impact of the nation of origin on brand trust, using Vietnam as a case study for India's COVID-19 vaccine. The findings of the study show that the country of origin has a significant impact on brand trust in Vietnam. However, also strong brands can contribute to the image of the country (Karimov & El-Murad, 2019). There is a growing belief among pharmaceutical product consumers that the actual performance of drugs and other medical products is usually based on the country of origin of the products. Extreme signs, such as brand name and country of origin, affect how buyers perceive products, since in the minds of consumers, products from some countries are perceived to have higher performance compared to products from other countries (Ahmed et al., 1995). Many consumers believe that the "made in" level means that a product is superior or "inferior depending on their perception of the country of origin (Mohd Yasin et al., 2007; Šapić et al., 2021; Karimov & El-Murad, 2019). The prior research suggested that the country of origin and the quality of products have a positive relationship (Lo, 2012).

### 3. METHODOLOGY

The study aimed to analyze the impact of the country of origin on the decision to purchase medicaments from the pharmaceutical sector in Albania and also to highlight the most critical factors affecting the impact of the country of origin on the choice of pharmaceutical products. The sample of this study consists of hospital and community pharmacy pharmacists. This study was conducted in Tirana in the period February-April 2021. The sample number was 200 pharmacists, doctors, and chemists. The survey method was selected for data collection. It is one of the most effective means of gathering information when it comes to field study. Closed-ended questions and a small number of open-ended questions were used for the structure of the questionnaire. The open-ended questions were included in order to better understand the behavior of pharmacists toward their choices. There was sufficient space in the open-ended questions where the respondents could express their opinions. For the answers that were collected from the questionnaires in the field, the data processing was performed through the SPSS statistical program.

### 4. DATA ANALYSIS

A total of 200 professionals engaged in the pharmaceutical business were included in the study. It included doctors, pharmacists and chemists. The majority of respondents were pharmacists (63%), 33% were chemists and 5% were doctors. This indicates that the sample was relevant, thus they provide information on the "country of origin" factor and its impact on the

pharmaceutical business in the context of the study. The gender and age distribution of the people who participated in the study further shows that the mix of female and male professionals is more or less balanced.

**Table 1.** Demographic data

<b>Demographic data</b>	<b>Percentage</b>
<i>Gender</i>	
Male	54
Female	46
<i>Age</i>	
20-30	35.5
31-40	18
41-50	33.5
51-60	11
+ 61	2

**Source:** Author

About 92% of the respondents reported that they always want to know which country the products they choose are imported from. For 92% of respondents knowing the country of origin is very important and for 8% the origin is not so important. They say that they want to associate every drug they buy with a patent which shows exactly where the drugs are produced and which trading company made them.

The perceptions created among Albanian consumers for a series of products are that foreign products are of better quality than domestic ones, where 83% considered foreign drugs of better quality than domestic ones and only 17% of respondents considered domestic production of drugs as a choice in their purchases. Hence, 83% emphasized that their choice for medicines is always foreign production, although they mentioned that in some cases, they are obliged because of their consumers to choose local products due to the lower price of medicines produced in the country. Nevertheless, what was noticed was that all respondents thought that if in Albania this industry were at the right standards, they would support domestic production.

The only thing that keeps pharmacists connected to locally produced drugs is the price, and the quality of the drugs is viewed with great skepticism. According to them, local medicines are an alternative to purchase but it is not the best quality alternative.

About 85% of study participants reported that they chose a brand of a drug, that they perceived to have a high quality. This shows that quality is taken into consideration when deciding on choosing the brand. A good reflection of this is shown by the fact that 74% of respondents say they choose a brand that is produced by an innovative pharmaceutical company. Moreover, 54% reported choosing a brand of a drug that is manufactured in Europe while about 30% say they chose a brand of a drug that is manufactured in America. On the contrary, only 13% of respondents indicated that they chose a brand of a drug produced in Albania and 3% chose a drug produced in Asia.

Not only the respondents but also the consumers have created the idea for several years now that every product of every category if it is of foreign origin, is of high quality. This is based on the fact that the domestic industry is at not high standards. Respondents to this study also had certain reserved opinions regarding domestic production in every industry, not only in the pharmaceutical industry.

In this study, high price was considered as a signal for high quality. The majority (54%) reported that the ability to afford prices affects them. Likewise, about 36% said they consider the low price as their priority when choosing drugs. The percentage of those who reported choosing a high-priced medicine, because they believe it is of the best quality, was 13%, and according to them, often imported products are medicines that have a high price.

From the consumer's point of view, price is the sacrifice to get a product. Hence, consumers undergo a cognitive or rational decision-making model to reach the perceived value of a product. They reported that they will choose a high-priced medicine because they believe it is of better quality and especially because the product is from a foreign country. Such stereotypes give imports a great priority over domestic production. About 67% of respondents would buy high-priced drugs given the fact that they may be of foreign origin.

When a drug is selected, one of the first things to consider is why the product is used. But during the selection, they start with a target and know very well what medicine they are looking for and what it is used for. This makes this factor not very important when selecting because they start the definition of what they want by describing that they are looking for a medicine that helps and is used for this reason. In each industry, knowledge about the use of the product is obtained in detail by the seller. But in the field of pharmaceutical industry traders of products of this field should know well what they ask for.

It is noticed during the study of the literature that different foreign countries can produce drugs with the same use and in this case other selective factors will come into play as ranked by the answers as the most important, the "country of origin" factor. But who are the influencers and the points on which the product selections and their country of origin are based?

The perception created about the country of origin of products plays a critical role in consumers' decision to buy. Pharmacists say that when their customers want to buy a medicine, in addition to the price, they also ask about the country of origin. Regular customers have helped pharmacies get some sort of orientation and know what and where to look for a particular product in a particular country of origin.

Customers' perception of pharmaceutical products, based on the country of origin, is that medicines produced in Albania are inferior to foreign medicines. Getting to know customers helps pharmacists get valuable messages and about 38% of them say that they take into account customer feedback when it comes to the pharmaceutical industry in Albania. According to consumers, the reasons for this include the fact that the materials used in production are of lower quality compared to the materials used by foreign counterparts. Moreover, the manufacturers of medicines in the country try to secure profit from the materials used in the production of medicines, compromising their quality and efficiency.

From the data of the study, it resulted that, consumers have the perception that Albanian medicines are of an inferior quality compared to pharmaceutical products from foreign countries, and are also less effective. 63% of the surveyed pharmacists involved in this study, being well acquainted with the field of industry, say that in domestic production, the production of medicines is in a limited number, neither qualitative nor effective, making Albania inferior to the products produced outside the country. The remaining 37% (most of them in the third age) say that they also select local production, taking into account only the price.

Due to the frequent and high demand for foreign products and services especially in the pharmaceutical industries in recent times, locally produced medicines are not well advertised to attract the attention of consumers in society. Some believe that there is no need for advertising because this will lead to an increase in various costs. In addition, the laws in our country do not allow the advertising of pharmaceutical drugs, especially prescription drugs. Meanwhile, some respondents say that due to the low quality of drug production in the country, its widespread advertising would not have any significant impact.

Respondents emphasized that the high demand for locally produced pharmaceutical products would lead to building a strong corporate image, thus making the brands very favorable and competitive. However, there is a strong dissenting attitude on the part of some respondents and it is stressed that Albania cannot produce all the medicines that may be required.

Below, Table 2 presents the consumers' perceptions. Some of the reasons that remain strong at the time of choosing purchases are as follows in the form of variables:

**Table 2.** Perceptions about drug production in Albania

Variables	Rate	Standard Deviation
Medicines produced in Albania are few in number.	46%	1.362
Medicines produced in Albania do not have high quality.	56%	1.501
Medicines produced in Albania are inferior compared to those produced abroad.	49%	1.398
It is prestige to buy medicines produced abroad (outside the country).	36%	1.145
All the reasons mentioned above.	54%	1.421

**Source:** Author

Definitely, there are locally produced medicines that are equally effective and have potential. Some of the respondents (46%) say that consumers tend to buy foreign medicines when there is no local substitute. As mentioned above in the data analysis, some of the determining factors for the choice of products based on the country of origin had a very influential role and the factor with the highest rate is “product knowledge and ease of obtaining information forwarded by the country of production in order to make the medicine more reliable”.

**Table 3.** Importance of influencing factors of the country of origin

Variables	Rate	Standard deviation
Policy of the country we import from	48	1.316
Culture	48	1.423
Economy	56	1.489
Technology	65	1.528
Image	43	1.421
Product Knowledge	75	1.555
Product experiences	38	1.011

**Source:** Author

85% of respondents say that it is very important to ask for the necessary information about any existing or new pharmaceutical product, especially for its country of origin and the name of the manufacturer of the medicines.

Often, the country-of-origin acts as a selective element from which consumers can make choices about a product based on their beliefs about the country of origin of the product (Verlegh & Steenkamp, 1999).



These respondents further highlighted that the search for relevant information about the country of origin for pharmaceutical products allows them to choose among the best alternatives, which leads to quality assurance and efficiency of pharmaceutical products. Moreover, information about the country of origin enables respondents to discover new pharmaceutical products from different countries with high and quality standards.

Nevertheless, other respondents have a different point of view and argue that searching for information only about the country of origin of pharmaceutical products is not enough as the information can sometimes be untrue.

Consumer knowledge about the country of origin of pharmaceutical products in Albania includes the fact that the person always seeks information about the origin when buying medicines that have a high risk of malfunction. Consumers in most cases have the perception that products from some countries are automatically of a higher quality, while those from some other countries are of lower or inferior quality. With consumer knowledge of the country of origin of pharmaceutical products in Albania, information on the country of origin of drugs determines the quality of the product with a rate of 85% of the response rate, and these rates of respondents are of the opinion that information on the country-of-origin serves as a guide to help them choose quality pharmaceutical products among all the other alternatives available. There is no denial of the fact that some countries tend to produce inferior medicines which do not meet the established international standards and distribute them in the market for consumption, so the available information can substantially help consumers to determine which products of the respective countries are of high quality before making the purchase decision. There are several countries known for producing a high-quality product, so consumers find it very easy and convenient to buy from such countries. Most often, there should be a main point or source where consumers of pharmaceutical products may quickly obtain relevant information about the efficacy and quality of medicines, and ultimately the country of origin is the most used source from which such information can be extracted.

With consumer knowledge of the country of origin of pharmaceutical products in Albania, necessary in order to buy a new drug, the country of origin is the first piece of information that consumers take into consideration. Consumers make judgments about the value of product information and actual performance, consumers can make suggestions such as a quality indicator, and then combine the judgments of all possible features in order to get an overall product rating (Jacoby, 2000) Respondents believe that the element that should be taken into account when requesting information about the quality of the pharmaceutical product is the country of origin, as some countries present a good image for high-quality products and consumers believe that quality is the main feature of these products. From the data of the study, according to the respondents, the countries that have high-quality and effective production of medicines are mostly European. Specifically, 68% of respondents emphasized that they would select and choose products only from European countries. The reasons for the choice are mentioned as follows:

1. Quality (32%),
2. Geographical proximity (6%),
3. Developed economy (20%),
4. Modern technology (30%),
5. Good image – reputation (12%).

Some respondents said that Europe has a favorable pricing system which makes the choices even easier. America ranks second in the choice of drugs by respondents. About 30% of them

admitted that America is the only country that can have high-quality products. The technology of the country has a very big impact as it is a factor that is taken into consideration during the production of medicines. Above all, the science of pharmacy in America made very big steps and therefore it is preferred to be one of the countries that may supply Albania with medicines. But the respondents logically approved that, American products are scarce in the market at the moment because there may be some hindering factors as follows hereunder:

1. Geographical distance brings an increase in costs leading directly to an increase in the purchase and sale price of drugs.
2. Innovative products are often improved and this leads again to increased costs. Even though innovative products should not be a hindrance, our market has difficulty in affording the price.
3. Medications from Europe are preferred over American medications. The image of Europe is more closely related to the Albanian market.

Medicines produced in Asian countries are almost never mentioned by respondents, with only 2% of them mentioning India. Although still a developing country, in the pharmaceutical industry India ranks first among Asian countries as a choice due to low prices by the respondents of this study.

## 5. CONCLUSION

Consumers and pharmacists in Albania perceive that medicines produced in the country are of inferior quality and less effective compared to pharmaceutical products from foreign countries. Searching for relevant information about the country of origin for pharmaceutical products allows them to choose among the best alternatives, which leads to quality assurance and efficiency of pharmaceutical products. In addition, locally produced medicines are not widely advertised.

The results generally show that the country of origin of pharmaceutical products plays an important role in helping pharmacists and consumers purchase pharmaceutical products, and in choosing the best and most effective medicines from countries that are perceived by consumers to have high-quality medicines. The country of origin serves as a means through which consumers of pharmaceutical products return to seek information about original and high-quality products for their consumption and further serves as a means to acquire information about countries offering highly competitive and result-oriented products or medicines for pharmacists as well.

Furthermore, information on the country of origin helps traders of pharmaceutical products (pharmacists) discover new medicines and brands to serve as an alternative or a substitute for the products that consumers already use.

The country of origin should always be considered before making a purchase decision as it provides reliable information for pharmacists and consumers of pharmaceutical products. The quality and standards of pharmaceutical products are best ascertained if the information of the country of origin is well known. Consumers of pharmaceutical products should always seek information about the country of origin when buying medicines that have a high risk. Consumer behavior must be effectively managed in order to address the complexity and dynamism of consumers.

It is recommended that further research be done on other variables of the country of origin, such as country image and prices of pharmaceutical products in order to determine their impact on the choice of pharmacists and consumers.

## References

- Aaker, D. A. (1996). *Building strong brands*. New York: The Free Press.
- Ahmed, S. A., d'Astous, A., & Champagne, C. (2005). Country images of technological products in Taiwan. *Asia Pacific Journal of Marketing and Logistics*.
- Ahmed, S. A., d'Astous, A., & Mathieu, A. (1995). Influences relatives des lieux de conception et d'assemblage sur la perception des produits de consommation. *Canadian Journal of Administrative Sciences/Revue Canadienne des Sciences de l'Administration*, 12(3), 210-223.
- Aichner, T., Forza, C., & Trentin, A. (2017). The country-of-origin lie: impact of foreign branding on customers' willingness to buy and willingness to pay when the product's actual origin is disclosed. *International Review of Retail, Distribution and Consumer Research*, 27, 43-60.
- Al-Sulaiti, K. I., & Baker, M. J. (1998). "Country of origin effects: a literature review", *Marketing Intelligence & Planning*, Vol. 16 No. 3, pp. 150-199. <https://doi.org/10.1108/02634509810217309>
- Dawar, N., & Parker, P. (1994). 'Marketing universals: consumers' use of brand name, price, physical appearance, and retailer reputation as signals of product quality', *Journal of Marketing* 58: 81-95.
- Fournier, S. (1998). Consumers and their brands: Developing relationship theory in consumer research. *Journal of Consumer Research*, 24, 343-373.
- Insch, G. S., & McBride, J. B. (2004). The Impact of Country-of-Origin Cues on Consumer Perceptions of Product Quality: A Binational Test of the Decomposed Country-of-Origin Construct. *Journal of Business Research*, 57, 256-265. [https://doi.org/10.1016/S0148-2963\(02\)00323-5](https://doi.org/10.1016/S0148-2963(02)00323-5)
- INSTAT. (2018). <http://www.instat.gov.al/>
- Jacoby, J. (2000). Is it rational to assume consumer rationality? Some consumer psychological perspectives on rational choice theory. *Some Consumer Psychological Perspectives on Rational Choice Theory*, 00-09.
- Johansson, J. K., Douglas, S. P., & Nonaka, I. (1985). Assessing the Impact of Country of Origin on Product Evaluations: A New Methodological Perspective. *Journal of Marketing Research*, 22, 388-396. <https://doi.org/10.2307/3151584>
- Karimov, F., & El-Murad, J. (2019). Does country-of-origin matter in the era of globalisation? Evidence from cross sectional data in Uzbekistan. *International Journal of Retail & Distribution Management*, 47(3): 262-277.
- Knight, G. A., & Calantone, R. J. (2000). A Flexible Model of Consumer Country-of-Origin Perceptions: A Cross-Cultural Investigation. *International Marketing Review*, 17, 127-145. <http://dx.doi.org/10.1108/02651330010322615>
- Kumura, P. A. P. S., & Canhua, K. (2010). Perceptions of country of origin: An approach to identifying expectations of foreign products. *Journal of Brand Management* 17 (5): 343–353.
- Lee, J., & Lee, J. N. (2009). Understanding the product information inference process in electronic word-of-mouth: An objectivity–subjectivity dichotomy perspective, *Journal of Information & Management*, Vol. 46, pp. 302–311.
- Lo, S. C. (2012). A study of relationship marketing on customer satisfaction. *Journal of Social Science*, 8: 91-94
- Lusk, J. L., Brown, J., Mark, T., Proseku, I., Thompson, R., & Welsh, J. (2006). "Consumer behavior, public policy, and country-of-origin labeling", *Review of Agricultural Economics*, Vol. 28, No. 2, pp. 284–292.
- Mohd Yasin, N., Nasser Noor, M., & Mohamad, O. (2007). Does image of country-of-origin matter to brand equity? *Journal of Product & Brand Management*, 16(1), 38-48. <https://doi.org/10.1108/10610420710731142>

- Nagashima, A. (1970). A comparison of Japanese and US attitudes toward foreign products, *Journal of Marketing*, 34(1), 68-74
- Pappu, R., Quester, P. G., & Cooksey, R. W. (2006). Consumer-based brand equity and country-of-origin relationships: Some empirical evidence. *European Journal of Marketing*.
- Šapić, S., Lazarević, J., & Filipović, J. (2021). The effect of country - of - origin image through quality, design and attractiveness related to product on consumer loyalty. *The European Journal of Applied Economics*, 18(1), 137-150. <https://doi.org/10.5937/EJAE18-28972>
- Sivakumar, V. J. (2009). *Country-of-origin and its impact on brands*. Retrieved from <http://www.wbiconpro.com/13.-Siva.pdf>
- Trang, P., Tran, R., & Fabrize, O. (2013). "The Effect of the Foreign Brand on Consumer Perception," *Journal of Marketing Development and Competitiveness*, Vol. 7, Iss. 2, pp. 23 – 36.
- Tung, J. (2012). The effect of price promotion strategy on purchase intention of customers. *Actual Problems Econ.*, 134: 495-503.
- Verlegh, P. W., & Steenkamp, J. B. E. (1999). A review and meta-analysis of country-of-origin research. *Journal of Economic Psychology*, 20(5), 521-546.
- Vo, M. S., Nguyen, T. H., Thach, T. V., Tran, D. V., Hoang, N. H. G., & Pham, N. P. T. (2022). The effect of the country of origin on brand trust: A case study for COVID-19 vaccines in Vietnam. *The Journal of Asian Finance, Economics and Business*, 9(4), 357–366. <https://doi.org/10.13106/JAFEB.2022.VOL9.NO4.0357>
- Yagci, M. I. (2001). Evaluating the effects of country-of-origin and consumer ethnocentrism: A case of a transplant product. *Journal of International Consumer Marketing*.



# Understanding Regenerative Tourism as a Catalyst for Sustainable Economies: An Analysis of Selected Practices

Marlene Amorim<sup>1</sup>   
Marta Ferreira Dias<sup>2</sup>   
Filipa Brandão<sup>3</sup>   
Raquel Castro Madureira<sup>4</sup>   
Rui Costa<sup>5</sup>   
Zélia Breda<sup>6</sup>   
Cristina Guardado<sup>7</sup>   
Marcela Lopes<sup>8</sup>   
Bruna Pedro<sup>9</sup> 

Received: July 26, 2023  
Accepted: February 13, 2024  
Published: March 16, 2024

## Keywords:

Sustainability;  
Regenerative tourism;  
Regenerative practices;  
Communities;  
Portugal



Creative Commons Non Commercial CC BY-NC: This article is distributed under the terms of the Creative Commons Attribution-Non-Commercial 4.0 License (<https://creativecommons.org/licenses/by-nc/4.0/>) which permits non-commercial use, reproduction and distribution of the work without further permission.

**Abstract:** *The European sustainability agendas and debates present new challenges and opportunities for innovation, particularly in the tourism sector. As countries strive to achieve carbon neutrality by 2050, the tourism industry must align its activities with these goals. Many tourism businesses are undergoing profound changes, embracing digital technologies and redesigning processes to prioritize sustainability. In recent years, the concept of regenerative tourism has emerged, setting even more ambitious goals. Regenerative tourism aims to proactively regenerate communities, cultures, nature, and economic systems. While lacking a stable academic definition, regenerative tourism is already driving the development of innovative tourism experiences that have transformative effects on specific destinations. This paper provides an exploratory analysis of regenerative tourism, including a literature review and an analysis of selected regenerative tourism practices in Portugal. Through qualitative analysis, the study examines the practices adopted by tourism stakeholders and evaluates their economic, social, and environmental benefits. The findings and lessons learned from these cases serve as valuable guidance for other destinations interested in embracing regenerative tourism principles and practices. Ultimately, the study contributes to the advancement of a more resilient and regenerative global tourism industry.*

## 1. INTRODUCTION

The priorities that are advanced in the European sustainability agendas trigger new challenges and opportunities for innovation for all. For the tourism sector, which represents a substantial part of many European economies, the time is for change. Territories and their local stakeholders are called to align their economic activities with the carbon neutrality goals that are set for 2050.

<sup>1</sup> GOVCOPP & DEGEIT, University of Aveiro, Campus Universitário de Santiago, 3810-193 Aveiro, Portugal  
<sup>2</sup> GOVCOPP & DEGEIT, University of Aveiro, Campus Universitário de Santiago, 3810-193 Aveiro, Portugal  
<sup>3</sup> GOVCOPP & DEGEIT, University of Aveiro, Campus Universitário de Santiago, 3810-193 Aveiro, Portugal  
<sup>4</sup> GOVCOPP & DEGEIT, University of Aveiro, Campus Universitário de Santiago, 3810-193 Aveiro, Portugal  
<sup>5</sup> GOVCOPP & DEGEIT, University of Aveiro, Campus Universitário de Santiago, 3810-193 Aveiro, Portugal  
<sup>6</sup> GOVCOPP & DEGEIT, University of Aveiro, Campus Universitário de Santiago, 3810-193 Aveiro, Portugal  
<sup>7</sup> ESTGA, University of Aveiro, Campus Universitário de Santiago, 3810-193 Aveiro, Portugal  
<sup>8</sup> ESTGA, University of Aveiro, Campus Universitário de Santiago, 3810-193 Aveiro, Portugal  
<sup>9</sup> ESTGA, University of Aveiro, Campus Universitário de Santiago, 3810-193 Aveiro, Portugal

Driven by this agenda, many service businesses in the tourism sector are implementing profound changes in their business models and processes, including the adoption of digital technologies to support the green transition and redesign processes driven by sustainability concerns. In many cases, the digital and green agendas go together and strengthen each other. Nevertheless, the ambitious goals that are set call for profound changes in the models of operation and organization of the value production systems involving changes that are social, technological, environmental, economic, and political, and cannot be achieved without the engagement of local communities in a meaningful manner. It is in this context that the term regenerative tourism is being advanced as an alternative value creation model.

Whereas the sustainability paradigm calls for the design of production ecosystems that preserve the resources and close the production-consumption loop, the idea of regeneration sets the goal further to develop businesses whose activities contribute to proactively regenerating communities, cultures, nature, and economic systems. Despite a lack of a stable academic definition for the term regenerative tourism, we are already witnessing the development of a range of innovative tourism service experiences that can be addressed as transformational in the sense that they contribute to increasing the potential of specific tourism destinations to create net positive effects by regenerating social and economic ecosystems.

This study offers an exploratory analysis of the concept and emerging practices of regenerative tourism. The study builds on a preliminary concise literature review to frame the idea of regenerative tourism, discussing it towards the concept of sustainability. The study offers an analysis of selected cases of regenerative tourism practices, in Portugal, providing a characterization and illustration of regenerative initiatives that contribute to increasing the understanding of the concept. Moreover, the paper builds on the qualitative analysis of the practices of regenerative tourism adopted by the actors in the tourism sector to understand its expression at the economic, social and environmental levels. The literature review is resumed in section 2 of the paper, setting the conceptual background that guided the selection of the cases. The details on the methodology and the research steps are included in section 3, followed by a description of the analysis and a discussion of the findings in section 4. The conclusion section is devoted to the discussion of the overall coverage of the paper and concluding remarks. The lessons learned from these cases, and their characterization provide a first building block to advance the conceptual framing of regenerative tourism and offer valuable guidance for other destinations seeking to explore the approach to regenerative tourism principles and practices.

## **2. CONCEPTUAL BACKGROUND**

This section provides a conceptual background on sustainable tourism and regenerative tourism, highlighting their principles, dimensions, and the assessment of their impacts on destination economies and communities. The subsections delve into the fundamental principles and dimensions of sustainable tourism, discuss the evolution towards regenerative tourism as a more holistic approach, and explore the assessment methods for evaluating the impacts of regenerative tourism practices.

### **2.1. Sustainable Tourism: Principles and dimensions**

Sustainable tourism is grounded in a set of fundamental principles and concepts that guide its development and implementation. These principles revolve around responsible resource

management, environmental conservation, and socio-cultural authenticity (Weaver & Lawton, 2022). By incorporating these principles, sustainable tourism seeks to strike a balance between the interests of visitors, host communities, and the environment, ensuring the long-term viability of tourism destinations.

The environmental dimension of sustainable tourism focuses on minimizing environmental degradation and preserving natural resources. It encompasses a range of practices aimed at reducing the ecological footprint of tourism activities. These practices include waste management, energy efficiency, water conservation, and biodiversity protection (Gössling et al., 2021). Adopting eco-friendly measures, such as promoting sustainable transportation options, using renewable energy sources, and implementing sustainable infrastructure, can contribute to the preservation of ecosystems and minimize negative environmental impacts.

The social dimension of sustainable tourism places a strong emphasis on community engagement, cultural preservation, and social inclusivity. Sustainable tourism seeks to empower local communities by involving them in decision-making processes and ensuring their active participation in tourism development (Hall & Williams, 2023). By promoting cultural heritage preservation, supporting local entrepreneurship, and fostering social well-being, sustainable tourism aims to create a sense of ownership and equitable distribution of benefits among the host communities.

The economic dimension of sustainable tourism highlights the importance of long-term economic stability and benefits for the host communities. Sustainable tourism practices contribute to economic diversification, employment opportunities, and income generation (Jamal & Camargo, 2022). Supporting local businesses, encouraging sustainable supply chains, and promoting fair trade practices are some strategies employed to enhance the economic resilience of tourism destinations. Sustainable tourism can provide direct economic benefits to communities, improve their livelihoods, and contribute to poverty reduction.

Sustainable tourism plays a pivotal role in achieving long-term economic stability and fostering community well-being. It contributes to economic growth, poverty reduction, and social inclusion (Becken & Hay, 2021). By investing in sustainable tourism development, destinations can create employment opportunities, stimulate entrepreneurship, and enhance local income levels. Additionally, sustainable tourism promotes infrastructure development, access to services, and cultural revitalization, leading to an improved quality of life for local communities (Sharpley & Telfer, 2023).

## 2.2. Regenerative Tourism: Moving beyond Sustainable Tourism

Despite the advances observed around the world to implement sustainable tourism development and to assure that tourism businesses and destinations meet, as much as possible, the Sustainable Development Goals, new approaches are emerging, in order to make the process more effective. This is the case with regenerative tourism.

Recent studies demonstrate that there is no universal definition of regenerative tourism (Bellato et al., 2022). Notwithstanding, Dredge (2022) argues that regenerative tourism practices result in an investment in local people, places, and nature, supporting the long-term renewal of social and natural environments. In addition, Duxbury et al. (2021) and CBI (2022) believe that

regenerative tourism goes beyond sustainability, as it focuses on tourists leaving the places better than they found them. This helps to move forward the concept of sustainability, grounded on leaving the places as they were found. This approach requires that new economies search for benefits that go beyond financial growth and profit (Duxbury et al., 2021).

It is clear that a more operational and global definition of regenerative tourism is needed, especially to allow the design of both research frameworks and practical measures that can be implemented by public and private organizations. While this concept is still vague, several characteristics and principles can be identified (Bellato et al., 2022).

First, it must be acknowledged that this is not a specific type of tourism, but rather a holistic view and understanding that the future of tourism development includes local communities, the environment, and the commitment of visitors to the preservation and protection of natural, social, and cultural dimensions of the place (Fusté-Forné & Hussain, 2022; Duxbury et al., 2021). Also, regenerative practices demand capacity building and development, integrating all stakeholders in the design and implementation of inclusive and regenerative tourism planning. Bearing this in mind, regenerative tourism activities have the potential to revitalize and regenerate destinations by creating a cycle of positive impacts on local people and their economies, preserving local culture and biodiversity, while destinations and businesses provide authentic, unique, and memorable travel experiences (CBI, 2022). This may form the basis to rethink and rebuild the tourism industry worldwide. As concluded by Bellato et al. (2022, p. 9), “regenerative tourism is a transformational approach that aims to fulfil the potential of tourism places to flourish and create net positive effects through increasing the regenerative capacity of human societies and ecosystems.”

The United Nations (cit in Martin-Rios & Laurent, 2021), propose seven principles that can be followed in order to design and implement regenerative tourism framework and mindset: (i) an holistic understanding of tourism, acknowledging that every stakeholder is related and interdependent, which demands for knowing the quality of the interactions in the global tourism ecosystem; (ii) foster collaboration between stakeholders through the creation of solid networks; (iii) diversify the sources of income so that communities are less dependent on tourism, as well as diversify between distinct market segments (leisure, business, domestic, international – this will create more resilient destinations; (iv) develop inclusive an equitable tourism involving local communities and businesses, e.g.: supporting homeless or refugees; (v) offer tourism experiences that are authentic, immersive, and meaningful, showcasing local culture, gastronomy, traditions, landmarks and wildlife in a responsible manner (honoring the sense of place); (vi) manage natural resources and biodiversity responsibly, protecting landscape and wildlife; (vii) protection of cultural heritage, indigenous people and ethnic groups.

To these fundamental principles, Ho (2020), adds that regenerative tourism should be aspirational, that is, focusing on actualizing the potential of all people, individually and collectively, and the need for continual evolution, since regeneration is not an isolated event, it evolves continuously and demands for continual adaptation.

In a more operational approach, the organization Future of Tourism (2023), defends the use of sustainability standards, advises tourism destinations to choose quality over quantity to enhance the visitors' experience while maintaining the character of the territory and benefiting local people, and strongly advocates for natural environment protection, by mitigating climate impacts, assure the transition to circular economy, and contain tourism's land use.



Finally, [Becken and Kaur \(2021\)](#) advert that regenerative tourism businesses and practices should adopt environmental certification, assure that tourism fosters the restoration of ecosystems, that products used in tourism are sourced locally whenever possible, that tourism businesses are locally owned and/or operated and that employees are mostly locals, and the business are included in a cooperation network.

### 3. METHODOLOGY

This is an exploratory study, carried out within the Erasmus+ project “Enforce – Enhancing resilience of tourism sector through training & development of regenerative tourism experiences” (Project N°. 2022-1-LU01-KA220-VET-000089887), of which the University of Aveiro is one of the partner institutions. The project aims to develop the skills of entrepreneurs in the tourism sector by developing regenerative tourism experiences through the integration of storytelling.

Under this scope, the purpose of this work is to identify good practices in sustainable tourism in Portugal and to analyze them according to the principles and dimensions found in the literature. To this end, a qualitative approach was adopted. A non-probability (non-random) sample was defined, using the snowball sampling method, with two strategies. Tourism experts were asked to provide suggestions, and online searches were conducted on tourism promotion portals, specialised publications, and other resources such as online magazines, newspaper articles, or travel blog posts on regenerative experiences. The cases identified were selected and assessed under the light of regenerative tourism principles found in the literature review, to validate if they were indeed regenerative experiences. It was also sought that the selected practices were diverse, corresponding to a variety of tourism subsectors. A total of 19 practices were selected and classified into 5 categories - rural tourism, natural locations, creative and cultural centres, walking and hiking routes and farming (see section 4). The analysis of the results also considered the geographical distribution of the selected experiences and the impact/benefits that each of them can have on the social, economic, and environmental dimensions of the territories.

### 4. RESULTS AND DISCUSSION

The preliminary characterization and analysis of the selected cases of regenerative tourism led to the development of a classification including 5 categories - rural tourism, natural locations, creative and cultural centres, walking and hiking routes and farming (Table 1). Among these, rural tourism initiatives were the most abundant (a total of 12 out of 19 cases had characteristics of rural tourism, while farming, creative and cultural centres and walking and hiking routes were the less represented. Whereas rural tourism initiatives are often the results of small entrepreneurial initiatives, creative and cultural centres and hiking routes can be more demanding to implement for requiring the involvement of local stakeholders as well as the investment in physical infrastructure in the natural landscape that needs to comply with national regulations.

**Table 1.** Classification of regenerative tourism cases

Category	Definition
<b>Rural Tourism</b>	Rural tourism is travel to natural places that aren't urbanised, often rely on agriculture and have small populations, such as villages and cottages, homestays, farms, and ranches or eco-lodges.
<b>Natural Locations</b>	Natural location means the location and elevation of those channels, swales, and other conveyance systems not made by man.

<b>Creative and Cultural Centers</b>	Creative and cultural centres are multifunctional interdisciplinary cultural institutions that provide access to culture and a wide variety of cultural services, where you are given the opportunity to create, so these are places that tend to stimulate the imagination.
<b>Walking and Hiking Routes</b>	A Walking and/or Hiking Route are predefined path through rural areas that people traverse.
<b>Farming</b>	Farming is the act or process of working the ground, planting seeds, growing edible plants, and raising animals, amongst others.

Source: Own research

#### 4.1. Characterization of Selected Practices

The regenerative tourism cases identified had a storytelling associated with the tourist experience. For example, the “Terramay” rural tourism initiative embeds the visitor in a story resorting to short texts intertwined with images, arranged dynamically, that talk about the animals, the soil, the activities carried out on the site, the spaces that make up the environment and, above all, respect for nature. It promotes the culture of regeneration by inviting the community to get involved and participate, as it offers guided tours of the farm, events, courses, and workshops. A detailed characterization of the selected practices is offered in Table 2.

**Table 2.** Classification and characterization of selected regenerative tourism cases

Case Studies	Description	Category
<b>A Walk for Diversity (1)</b>	This walking tour has contributed to changing the image of the Mouraria location, helping dynamizing the region, and showing its true richness, marked by a "multifaceted cultural history". The experience is led by the migrants themselves, who share their personal stories.	Walking and Hiking Routes
<b>Schist Villages (2)</b>	Besides the amazing landscapes the villas have to offer, they also offer you some labs and arts and crafts courses you can take. This is an environmentally sustainable tourism practice and dynamizes the place because it attracts new people to visit.	Natural Locations/ Creative and Cultural Centers
<b>BioRia (3)</b>	It's natural routes allow its visitors to enjoy landscapes, and by engaging in volunteering activities it also helps regenerate the natural diversity of the regions.	Natural Locations
<b>Biovilla (4)</b>	Quoting the mission of Biovilla, they aim to "reach total regeneration of our ecological, social and economic landscape". To do so they have their own farm, that is regenerating the soils of the region. They want to make sure no one suffers from the absence of food and help regenerate the ecosystems.	Farming
<b>“Casas do Juízo” Rural Tourism Houses (5)</b>	The accommodation is in the centre of a small village integrated into the Great Portuguese Historical Villages Route, and its importance for the vitality of the village. The possibility of interacting with the local community, getting to know the history of the village, its traditions and gastronomy and participating in agricultural activities is also present in the story.	Rural Tourism
<b>Cerdeira - Home for Creativity (6)</b>	This lodge is a cultural project, that led to the reconstruction of part of the village of Cerdeira, that promotes a relationship between nature, arts and a "free and authentic" way of life, highlighting several aspects, from the arts and crafts school to the preservation of the local ecosystem.	Rural Tourism/ Creative and Cultural Centres
<b>“Chão do Rio” – Village Tourism Houses (7)</b>	The accommodation offers several activities that allow guests to experience the simplicity of farm life, use the natural swimming pool, or get to know the natural heritage of the region. Some of the activities are developed in partnership with other local businesses so that the connection with the community is a reality.	Rural Tourism
<b>“Do Água Boa” - Rural Tourism House (8)</b>	Surrounded by natural landscapes this is a place to relax and have fun, since it offers multiple experiences to tourists, becoming a place of social and economic regeneration to the region.	Rural Tourism
<b>Eco Lodge Cabreira Nature Retreat (9)</b>	The "Cabreira" lodge is surrounded by nature and was built with exclusively sustainable materials, with the aim of minimizing environmental impacts. Cabreira is more than just an accommodation, it is a place where guests can disconnect from the hustle and bustle of the city and reconnect with nature.	Rural Tourism

<b>Matinha Estate (10)</b>	Matinha Estate offers experiences that go from wellness sessions to horse riding or tours through the Vincentian Route, among a lot of other options, that help connect with the natural and cultural heritage of the region.	Rural Tourism
<b>“Vale Do Rio” Rural Hotel (11)</b>	This eco-hotel, located in the district of Aveiro, uses renewable energies for its activity and offers beautiful landscape views to all its customers.	Rural Tourism
<b>Islet of Vila Franca do Campo (12)</b>	Located in front of the village of Vila Franca do Campo, about 1 km from the coast, this place is the result of the crater of an old, submerged volcano, considered one of the main tourist attractions of the island of São Miguel.	Natural Locations
<b>Onor River (17)</b>	Considered one of the wonders of Portugal, visiting Rio de Onor offers you the chance to enjoy the landscape of the area and to talk to the population around it. Besides the river, the region has multiple other choices of places to visit.	Natural Locations
<b>Sintra Natural Park - The Moorish Castle (13)</b>	Being the pinnacle of Romanticism in Portugal, the paths of the National Palace of Pena offer a chance to revisit the life of Portuguese old royalty, while enjoying the most important Cultural Landscape of Sintra.	Natural Locations
<b>Portugal A2Z1 Route (14)</b>	By taking a cycling or biking tour you will be able to get to know new and more rural places around the Portuguese territory. The Portugal A2Z storytelling focuses on unique destinations and enriching cultural experiences. It highlights the landscapes and places of Portugal as unique and enchanting, and around this narrative develops the differentials of a personalized experience with experienced professionals, away from the tourist crowds.	Walking and Hiking Routes
<b>Vale da Lama Farm (15)</b>	One of the most important actions of Quinta da Lama is their farm, which is helping regenerate soils, growing food, and therefore helping all the nature and community around them. This makes it environmentally and socially regenerative. Quinta da Lama attracts people from various places, which helps to dynamize the economy of the region.	Rural Tourism
<b>Alecrim Nature Reserve (16)</b>	All accommodations are surrounded by local fauna that is carefully preserved and taken care of. The presence of guests supports the conservation of local flora and fauna. Besides this, Alecrim Nature Reserve offers multiple options for visitors to relax. One of the restaurants, ‘Foggo’ offers local products on the grill, in a large camping tent by the lake.	Rural Tourism
<b>Six Senses Douro Valley (18)</b>	This company offers the chance to spend a few days surrounded by beautiful natural landscapes, while enjoying relaxing experiences, and has reinforced environmental and social responsibilities, emphasizing its concern with the impact on the community, and that is working on the regeneration of the community forest.	Rural Tourism
<b>Terramay (19)</b>	The story of Terramay begins on the banks of the Alqueva, between the Alentejo hills and the Spanish Estremadura. After countless journeys through southern Portugal, on 15 November 2018, the 562-hectare property was acquired by Thomas Sterchi and the Brito family, who created the project with the aim of promoting the importance of soil health, food awareness and the fight against desertification, producing food in a sustainable way and with respect for nature.	Rural Tourism

Source: Own research

#### 4.2. Overview of the Territorial Distribution of Selected Regenerative Tourism Cases

In what concerns the territorial distribution of the selected practices, it can be highlighted that the majority (31.6%) are in the Centre of Portugal. This is a large NUT II and tourism region including 100 municipalities and a large diversity of tourism experiences, mostly based on nature and rural tourism. Alentejo represents 21.1% of the cases. This region is the one with less tourism overcrowding and heavily relies on nature to develop its offer. It is, thus, one of the places where regenerative tourism may have a higher potential. The Lisbon Area, the North of Portugal and the Algarve are the most relevant tourist areas in Portugal, both in terms of number of guests, overnights, and tourism income. However, they are not the most representative in terms of regenerative experiences, which may be explained by the type of tourism that is promoted: in

the first two cases, relying on urban/city tourism, in the latter, characterised by ‘sun, sea, sand’ mass tourism. The Azores, despite only representing 5.3% is considered the most authentic and nature-based tourism region in Portugal, offering an excellent stage for the implementation of regenerative tourism practices. There is also a network (Schist Villages) distributed by the country. This is very relevant, considering that the establishment of networks and partnerships are one of the fundamental principles of regenerative tourism. As a general conclusion, it can be observed that the large majority of the cases are located less than one hour and a half, by road, from the Portuguese airports (Porto, Lisbon, and Faro). This leads us to acknowledge that these experiences are directed at international tourists arriving at national airports and are grounded on international tourism operations.



Figure 1. Territorial distribution of selected regenerative tourism practices in Portugal

Source: Own research

## 5. CONCLUSION AND FUTURE RESEARCH DIRECTIONS

This paper allows us to conclude that there is little research and empirical evidence on regenerative tourism, which leads to the inexistence of a consensual definition of the concept. However, some principles and characteristics can be identified in the few existing papers that can provide the grounds for the design of a regenerative tourism conceptual framework. What is acknowledged is that this type of practice, when correctly implemented, fosters the tourism industry to go beyond sustainability (leaving places as we found them) and improve tourism destinations, local communities, and the environment.

The conducted exploratory analysis of the 19 cases selected based on the principles and characteristics found in the existing body of knowledge brought important findings. The first is that most of these businesses are located close to the main Portuguese airports, which leads us to conclude that they are strongly based on international operations and foreign tourists. We were also able to associate a higher number of best practices with regions characterized by

their natural settings and by the authenticity of the offered experiences. This way, both natural ecosystems and local cultures will be preserved and disseminated, setting the grounds for new tourism business models to emerge, increasing the quality of life of locals, environmental regeneration, combat desertification, improvement of public spaces, and development of infrastructures and accessibilities, among others. The implemented practices should create or develop better conditions at social, cultural, economic, and environmental levels in order to be regenerative. In order to promote this, future research should create a solid framework based on both theory and robust empirical studies, so that practical guidelines can be designed and implemented by tourism businesses and destinations in important dimensions of regenerative tourism.

### Acknowledgment

This work was financially supported by the Research Unit on Governance, Competitiveness and Public Policies (UIDB/04058/2020) + (UIDP/04058/2020), funded by national funds through FCT - Fundação para a Ciência e a Tecnologia.

### References

- Becken, S., & Hay, J. (2021). Sustainable tourism and poverty reduction: An assessment of impact mechanisms. *Journal of Sustainable Tourism*, 19(2), 289-305.
- Becken, S., & Kaur, J. (2021). Anchoring “tourism value” within a regenerative tourism paradigm—a government perspective. *Journal of Sustainable Tourism*, 30, 52–68.
- Bellato, L., Frantzeskaki, N., & Nygaard, C. (2022). Regenerative tourism: a conceptual framework leveraging theory and practice. *Tourism Geographies*, 1-21.
- CBI (Centre for the Promotion of Imports from developing countries). (2022). *Regenerative tourism: moving beyond sustainable and responsible tourism*, available at <https://www.cbi.eu/market-information/tourism/regenerative-tourism>
- Dredge, D. (2022). Regenerative tourism: transforming mindsets, systems and practices. *Journal of Tourism Futures*, 8(3), 269-281.
- Duxbury, N., Bakas, F. E., Vinagre de Castro, T., & Silva, S. (2021). Creative Tourism Development Models towards Sustainable and Regenerative Tourism. *Sustainability*, 13(1), 2. <https://doi.org/10.3390/su13010002>
- Fusté-Forné, F., & Hussain, A. (2022). Regenerative tourism futures: a case study of Aotearoa New Zealand. *Journal of Tourism Futures*. <https://doi.org/10.1108/jtf-01-2022-0027>
- Future of Tourism. (2023). Guiding Principles, available at <https://www.futureoftourism.org/guiding-principles>
- Gössling, S., Scott, D., & Hall, C. M. (2021). *Tourism and water: Interactions and impacts*. Channel View Publications.
- Hall, C. M., & Williams, A. M. (2023). *Tourism and regional development: New pathways*. Routledge.
- Ho, A. (2020). Regenerative Travel Principles for Hospitality. Responsible Travel and CatchOn.
- Jamal, T., & Camargo, B. A. (2022). The social dimension of sustainable tourism: A review and critique. *Journal of Sustainable Tourism*, 25(8), 1065-1085.
- Martin-Rios, C., & Laurent, M. (2021). Regenerative tourism will be at the forefront of the recovery effort, available at <https://www.hospitalitynet.org/opinion/4103189.html>
- Sharpley, R., & Telfer, D. J. (2023). *Tourism and development in the developing world: A critical analysis*. Routledge.
- Weaver, D., & Lawton, L. (2022). *Tourism management* (6th ed.). John Wiley & Sons.





# An Overview of Foreign Direct Investments in Tourism and Hospitality Industry

Elvis Mujačević<sup>1</sup> 

Received: November 27, 2023

Accepted: December 29, 2023

Published: March 16, 2024

## Keywords:

Tourism;  
Job creation;  
Foreign direct investments



Creative Commons Non Commercial CC BY-NC: This article is distributed under the terms of the Creative Commons Attribution-Non-Commercial 4.0 License (<https://creativecommons.org/licenses/by-nc/4.0/>) which permits non-commercial use, reproduction and distribution of the work without further permission.

**Abstract:** *Tourism is one of the leading economic sectors of our time. The Tourism Investment report by fDi Intelligence of the Financial Times shows the link between foreign direct investment in tourism as a driver of job creation and economic growth worldwide. In an increasingly interconnected global economy, foreign direct investments (FDI) play a pivotal role in shaping the growth trajectory of various sectors. One such sector that has witnessed a substantial impact from FDI is tourism, a thriving industry that not only contributes significantly to a nation's GDP but also plays a pivotal role in job creation. This article delves into the symbiotic relationship between foreign direct investments in tourism and the generation of employment opportunities, shedding light on the mutual benefits that arise when nations open their doors to international investors. It also explores the significance of foreign direct investments in tourism, examining the positive effects on economic development, job creation, and the overall sustainability of the sector.*

## 1. INTRODUCTION

Tourism has established itself as the third-largest export category in the world, and in many high-growth economies, tourism is already the number one export. Between 2013 and 2017, foreign direct investment in tourism has remained strong resulting in hundreds of projects and tens of thousands of decent jobs each year, accounting for a staggering 10 percent of global GDP and jobs. In some regions, including Asia-Pacific, Europe, Latin America and the Caribbean, billions of dollars of capital were invested, and tens of thousands of jobs were created in 2017 alone (Fdi Markets, 2017). This gives us a very positive outlook for foreign direct investment in tourism at the end of the decade and is a testament to the resilience and reliability of our sector to the global economy.

In addition to its positive economic impact, it is important to point out that tourism also makes a social and environmental contribution. The United Nations World Tourism Organization (UNWTO) has committed to further strengthening tourism as a key partner in the implementation of the UN Sustainable Development Goals (SDGs). Foreign direct investments in the tourism industry contribute significantly to the economic development of host countries. The infusion of capital from foreign investors helps create job opportunities, stimulating employment across various sectors such as hospitality, transportation, and local services. Increased employment rates, in turn, lead to improved standards of living for local communities.

Moreover, FDI facilitates the development of tourism-related infrastructure, including hotels, resorts, transportation networks, and recreational facilities. These investments enhance the overall competitiveness of a destination, making it more attractive to international tourists and creating a positive cycle of economic growth.

<sup>1</sup> University of Rijeka, Faculty of Tourism and Hospitality Management, Opatija, Primorska 46, 51410 Opatija, Croatia

## 2. LITERATURE REVIEW

Foreign direct investment (FDI) is defined as an investment made to acquire a lasting interest in enterprises operating outside the investor's economy (IMF, 1993; WTO, 1996). In today's business world, more and more multinational companies are engaging in foreign direct investment. These companies are primarily motivated by the prospect of high profitability, along with the opportunity to reduce production costs, gain access to the local market, acquire higher quality natural, physical, or human resources at lower costs, and increase efficiency to improve global market position (Dunning & Lundan, 2008).

The influx is often seen as an essential component in promoting economic growth, as it brings with it technology, knowledge, capital and jobs that can have a positive impact on the host country's economy (Cambazoglu & Simay Karaalp, 2014). The governments of many developing and least-developed countries rely on the private sector and foreign investors to transform their economies and accelerate economic growth. Therefore, many countries around the world are opening their economies to foreign investors, structuring and liberalizing their FDI regimes and offering various tax and non-tax incentives to attract optimal levels of FDI. However, many countries are not able to realize their potential level of FDI as the movement of FDI depends on various economic, political and institutional factors. For this reason, research in the field of international studies has gained considerable attention to empirically investigate the determinants of FDI inflows (e.g. Asiedu, 2002; Chakrabarti, 2001; Leonardo et al., 2018; Moosa, 2009; Tang, 2017; Wijeweera & Mounter, 2008).

Mah and Yoon (2010) analyzed the determinants of FDI inflows to Indonesia and Singapore. Their empirical results based on a small sample cointegration test showed that in the case of Singapore, where per capita income is quite high, market size appears to have a positive and significant impact on FDI inflows, while variables reflecting production factor costs do not. Several studies have also been conducted to examine the determinants of FDI in various South Asian countries. Regarding the determinants of FDI in India, Wei (2005) concluded that the factors of cheap labour costs and geographical distance are important in attracting FDI. Zheng (2009) analyzed and compared the determinants of FDI inflows in India and China by considering both host and home country characteristics. His study found that labour costs, market growth, the country's political risk, imports and political liberalization were the most important factors for both countries.

However, cultural and geographical distance factors were important for India's FDI, while market size, exports and costs of credit were important for China's FDI. The size of the market, the level of development of the state, the financial strength of the state and the level of infrastructure were further determinants of FDI inflows in India, as shown by Dhingra and Sidhu (2011). Several studies have been conducted to analyse the determinants of foreign direct investment in various Middle Eastern countries. Among these studies, Coskun (2001) analysed the factors influencing foreign investment decisions in Turkey based on the results of three different surveys. The results showed that the market size and economic potential of the country were the most important considerations when deciding to invest in Turkey. In addition, belonging to powerful economic blocs, low-cost labour and cheaper inputs were other important determinants of foreign direct investment in Turkey.

Rodríguez and Pallas (2008) found that the difference between labour productivity and labour costs was an important determinant of FDI in Spain. They also concluded that factors related to demand, the development of human capital, the export potential of sectors and certain macroeconomic determinants that measure the average gap between Spain and the European



Union also play a crucial role in attracting FDI flows to Spain. Several papers have conducted cross-national studies on the determinants of EU economies (e.g. Bellak et al., 2009; Casi & Rezzini, 2010; Igošina, 2015; Janicki & Wunnava, 2004; Leonardo et al., 2018; Oezkan-Guenay, 2011; Stack et al., 2017; Villaverde & Maza, 2015; Tang, 2017). Bevan and Estrin (2004) found that labour costs, gravity factors and market size are the most important determinants of foreign direct investment in Central and Eastern European countries (CEECs).

Villaverde and Maza (2015) examined the determinants of foreign direct investment in the EU region between 2000 and 2006 and found that labour market characteristics, economic potential, competitiveness and technological progress had a significant impact on the inflow of foreign direct investment in the EU region, while labour regulations and market size did not play a significant role. In contrast, Igošina (2015) found that market size in combination with GDP growth rate, trade openness, labour costs and inflation rate had a significant impact on attracting foreign direct investment in the EU countries.

### 3. TOURISM INVESTMENTS FROM 2013 – 2021

#### 3.1. Asia-Pacific

Between 2013 and 2021, a total of 996 FDI projects were announced in the Asia-Pacific region. This resulted in capital investments worth \$103.4 billion and the creation of over 187,740 jobs. In terms of projects, foreign direct investment in tourism in the Asia-Pacific region peaked in 2018, when 194 investments worth \$28.6 billion were announced and 47,010 jobs were created. The amount of capital investment in the region fell from \$28.6 billion in 2018 to just \$1.6 billion in 2021, while the number of jobs created fell from about 47,400 to 3300.

**Table 1.** Tourism FDI into Asia-Pacific 2013 – 2021

Year	Capital Investment (\$bn)	Total projects	Jobs created
2013	9.6	122	17,451
2014	3.4	76	7,642
2015	8.0	86	15,102
2016	10.3	99	20,605
2017	6.3	84	18,250
2018	28.6	193	47,010
2019	24.3	167	37,009
2020	5.0	53	9,030
2021	1.6	32	3,029
<b>Total</b>	<b>103.4</b>	<b>996</b>	<b>187,740</b>

Source: Fdi Markets, 2022

China attracted the largest share of tourism FDI in the Asia-Pacific region between 2013 and 2021, with 208 equivalent investments or a market share of 20.97%. The country also saw project growth of 26% between 2018 and 2019, but the number of projects dropped to four in 2021, down 86% from 2019. China is followed by India (119), Singapore (89) and Japan (89) in the number of projects in the tourism sector between 2013 and 2021.

India ranks second in the Asia-Pacific region in total investment from 2013 to 2021, with a 12% market share, but has attracted the lowest number of tourism projects, with only two investment projects in 2021. This is an 88% drop in investment from 2019 when India reached its highest level of investment (Fdiintelligence, 2018, 2019, 2022).

**Table 2.** Top Countries in Asia-Pacific by number of projects 2013 – 2021

Country	Number of Projects	Proportion of Tourism FDI Projects in Asia-Pacific 2013-2021
China	208	20,97%
India	119	12,00%
Singapore	89	8,97%
Japan	89	8,97%
Australia	88	8,97%
Vietnam	60	6,05%
Thailand	51	5,14%
Indonesia	44	4,43%
Hong Kong	39	3,93%
South Korea	14	1,41%
Other	191	19,25%

Source: Fdi Markets, 2022

The third country with the largest number of projects from 2013 to 2021 is Singapore with 89 investments and a market share of 8.97%. In 2021, the number of projects in Singapore increases to a total of 6 projects with a total investment of \$25 million and 168 jobs created, which is double the tourism investment in 2020. The city-state will receive the most tourism investment of all Asia-Pacific countries in 2021. This is still half of what Singapore received in 2019. Japan also attracted 89 projects from 2013 to 2021, the same market share as Singapore and Australia with 88 projects. In 2018, 28 investment projects were announced in Japan, which was the peak year for Japan, but between 2018 and 2021, projects declined significantly, with only one investment in 2021. The amount of investment and the number of jobs created in Japan also reached a peak in 2018 (Fdiintelligence, 2018, 2019, 2022).

### 3.2. Europe

Between 2013 and 2021, 1317 tourism FDI projects were recorded in Europe and led to an investment volume of more than 67.7 billion dollars and the creation of more than 142,423 jobs. The peak year for tourism investment in Europe was 2019, with 293 projects, \$611.4 billion in capital investment, and nearly 26,311 jobs created. The United Kingdom accounted for the majority of European tourism FDI projects with a market share of 19.57% and also had the largest share of job creation. The UK was followed by Spain with 179 projects and a market share of 12% and Germany with 171 projects and a market share of 11.74%. The two countries together attracted 350 projects and had a market share of 23.74%.

**Table 3.** Tourism FDI into Europe 2013 – 2021

Year	Capital Investment (\$bn)	Total projects	Jobs created
2013	4,0	102	12,941
2014	1,9	92	5,892
2015	5,3	106	13,311
2016	3,7	108	10,441
2017	7,1	138	16,140
2018	25,5	215	35,442
2019	11,4	293	26,311
2020	5,1	135	11,441
2021	3,7	128	10,504
<b>Total</b>	<b>67,7</b>	<b>1317</b>	<b>142,423</b>

Source: Fdi Markets, 2022

Both capital investment and the number of jobs created by foreign direct investment in tourism in Europe reached an all-time high in 2018, with 25.5 billion invested and 35,442 jobs created. Between 2018 and 2021, capital investment in Europe fell by \$21.7 billion, while job creation fell by 70%. Spain was the leading destination with \$21.2 billion in capital investment and 22,900 jobs created between 2017 and 2021. Between 2013 and 2021, Turkey was the top target in emerging Europe in terms of the number of projects. It received 55 tourism investments totaling \$332.5 million and created 2200 jobs (Fdiintelligence, 2018, 2019, 2022).

**Table 4.** Top Countries in Europe by number of projects 2013 – 2021

Country	Number of Projects	Proportion of Tourism FDI Projects in Europe 2013-2017
UK	285	19,57%
Spain	179	12%
Germany	171	11,74%
France	140	12,98%
Portugal	78	9,61%
Italy	62	4,25%
Netherlands	57	3,91%
Turkey	55	3,77%
Ireland	41	2,81%
Poland	25	1,71%
Russia	19	1,30%
Other	344	23,62%

Source: Fdi Markets, 2022

### 3.3. North America

North America attracted 284 foreign direct investment projects in tourism between 2013 and 2021, investing nearly \$21.5 billion and creating more than 44,111 jobs. Both investment and the number of jobs created by foreign direct investment in tourism in North America peaked in 2019 with \$3.5 billion in investment and 6,420 jobs created. In 2021, 28 tourism projects were recorded — an increase of 4% compared to 2020. These projects generated \$776 million (a decrease of 37% compared to 2020) and created approximately 2400 jobs (31% less than 2020). Tourism FDI in North America increased from \$2 billion in 2017 to more than \$3.4 billion in 2019, before declining to \$1.2 billion in 2020. In 2021, investment in the region falls to \$776 million (Fdiintelligence, 2018, 2019, 2022).

**Table 5.** Tourism FDI in North America 2013 – 2021

Year	Capital Investment (\$bn)	Total projects	Jobs created
2013	2,5	22	6576
2014	2,5	17	6140
2015	4,6	34	7190
2016	1,2	25	2151
2017	2,9	32	5412
2018	2,4	44	4600
2019	3,4	53	6420
2020	1,2	28	3410
2021	0,8	29	2212
<b>Total</b>	<b>21,5</b>	<b>284</b>	<b>44,111</b>

Source: Fdi Markets, 2022

The leading American state for foreign direct investment projects in tourism between 2013 and 2021 is New York (62), followed by Florida (54) and California (39). These three states account for almost half of all foreign direct investment projects in tourism in the region.

California and Florida had a combined 93 projects and held a combined market share of 34.96% of tourism FDI projects and 33% of tourism investment in North America between 2017 and 2021. Over this period, Florida has eclipsed its West Coast rival in absorbing more tourism projects, capital investment and jobs (Fdiintelligence, 2018, 2019, 2022).

**Table 6.** Top Countries in North America by number of projects 2013 – 2021

Country	Number of Projects	Proportion of Tourism FDI Projects in North America 2017-2021
New York	62	23,31%
Florida	54	20,30%
California	39	14,66%
Ontario	19	7,14%
Nevada	6	2,26%
British Columbia	5	1,88%
Alberta	4	1,50%
New Jersey	4	1,50%
Quebec	4	1,50%
Illinois	4	1,50%
Colorado	3	1,13%
Other	62	23,31%

Source: Fdi Markets, 2022

### 3.4. Latin America and the Caribbean

Latin America and the Caribbean attracted 448 foreign direct investment projects in the tourism sector between 2013 and 2021. During these eight years, more than 158,885 new jobs were created, and \$36.6 billion worth of capital was invested in the region.

Mexico, Brazil and Colombia (the region's top three destinations for foreign direct investment in tourism between 2013 and 2021) accounted for more than half of all foreign direct investment in tourism in the region. Mexico was the most attractive country for foreign tourism investment from 2103 to 2107, accounting for 28.8% of tourism projects in Latin America, 36.6% of tourism jobs created, and almost 33% of tourism investment. 2017 was the best year for tourism investment in Mexico. Over \$1.3bn was invested, 20 projects were announced, and more than 10,600 jobs were created.

**Table 7.** Tourism FDI into Latin America and the Caribbean 2013 – 2021

Year	Capital Investment (\$bn)	Total projects	Jobs created
2103	3,5	50	22,929
2014	1,0	19	6673
2015	2,0	19	14,354
2016	2,4	32	15,857
2017	3,7	55	15,000
2018	8,3	133	34,750
2019	11,3	95	35,680
2020	3,6	29	10,800
2021	0,8	16	2,812
<b>Total</b>	<b>36,6</b>	<b>448</b>	<b>158,885</b>

Source: Fdi Markets, 2022

In 2021, investments in Latin America and the Caribbean will decrease by 78% compared to 2020, from 3.6 billion dollars to 800 million dollars. During this same period, job creation in the region has also fallen significantly, from around 10,500 in 2020 to 3,200 in 2021.

Mexico was once again the most important target market in the Latin America and Caribbean region between 2017 and 2021. Mexico accounted for 33% (108) of all foreign direct investment in tourism in the region. With a market share of 33% (\$9.3bn), Mexico was also the leading country in terms of capital investment and created the most jobs (33,800) in Latin America and the Caribbean.

Colombia and Peru ranked second and third in foreign direct investment in tourism with 40 and 30 projects respectively between 2017 and 2021, with Colombia having a 12% market share and Peru a 9.1% market share. Colombia also ranked second in terms of capital investment with \$5.5bn, representing 20% of the regional total over the five years (Fdiintelligence, 2018, 2019, 2022).

**Table 8.** Top Countries in Latin America and Caribbean by number of projects 2013 – 2021

Country	Number of Projects	Proportion of Tourism FDI Projects in Latin America and the Caribbean 2013 – 2017
Mexico	161	31,45%
Colombia	59	10,33%
Brazil	53	10,35%
Dominican Republic	43	8,40%
Cuba	35	6,84%
Peru	30	5,86%
Chile	22	4,30%
Argentina	18	3,52%
Costa Rica	11	2,15%
Ecuador	8	1,56%
Panama	7	1,37%
St Lucia	5	0,98%
Jamaica	4	0,78%
Uruguay	4	0,78%
Other	52	10,16%

Source: Fdi Markets, 2022

### 3.5. Middle East and Africa

Between 2013 and 2021, a total of 442 foreign direct investment projects in the tourism sector were announced in the Middle East and Africa region, representing an investment volume of USD 34.5 billion. In the same period, more than 62,428 new jobs were created in the region. In the Middle East and Africa region, foreign direct investment in the tourism sector increased by 70% in 2021, totaling USD 2.6 billion. In addition, the number of foreign direct investments in tourism rose to 46, an increase of 84% compared to 2020, and the number of jobs in tourism also rose to more than 5,000, an increase of 59% compared to 2020.

The UAE was the leading destination for foreign direct investment in tourism (148) and capital investment (USD 6.8 billion) between 2017 and 2021, each accounting for 31% of the regional total for the Middle East and Africa. In the same period, the UAE also created the most jobs in tourism, more than 12,900, representing a 29% market share in the region. In the period from 2013 to 2021, Morocco and Saudi Arabia ranked second and third in terms of capital investment. Saudi Arabia (9.96%), followed by Morocco with 6.36% of the regional total. The two countries attracted a combined \$3.8bn in foreign direct investment in the tourism sector over the five-year period (Fdiintelligence, 2018, 2019, 2022). The United Arab Emirates, Morocco and Saudi Arabia were the three countries that created the most jobs in tourism between 2013 and 2021.

**Table 9.** Tourism FDI into the Middle East and Africa 2013 – 2021

Year	Capital Investment (\$bn)	Total projects	Jobs created
2013	4,7	52	5,396
2014	3,5	37	3,963
2015	1,5	41	3,022
2016	2,7	34	4,588
2017	3,1	36	6,780
2018	6,0	67	11,640
2019	8,9	103	19,200
2020	1,5	26	2,839
2021	2,6	46	5,000
<b>Total</b>	<b>34.5</b>	<b>442</b>	<b>62,428</b>

Source: Fdi Markets, 2022

**Table 10.** Top Countries in the Middle East and Africa by number of projects 2013 – 2021

Country	Number of Projects	Proportion of Tourism FDI Projects in Middle East and Africa 2013 – 2017
UAE	148	31,36%
Saudi Arabia	47	9,96%
Morocco	30	6,36%
Egypt	30	6,36%
South Africa	23	4,87%
Oman	16	3,39%
Bahrain	16	3,39%
Qatar	10	2,12%
Tanzania	9	1,91%
Tunisia	8	1,69%
Israel	8	1,27%
Nigeria	6	1,27%
Iraq	5	1,06%
Jordan	5	1,06%
<b>Other</b>	<b>111</b>	<b>23,52%</b>

Source: Fdi Markets, 2022

In the Middle East and Africa region, the UAE was the top destination market for tourism FDI projects in 2021, with a total of 19 projects. It was followed by Saudi Arabia, Morocco, Egypt, South Africa, Oman and Bahrein. The second in terms of capital investment in the Middle East and Africa region was Saudi Arabia which welcomed \$518m worth of tourism capital investment in 2021. It created more than 1000 jobs and six FDI projects in the cluster in 2021. The UAE was also the primary source country for tourism investments between 2013 and 2021. The Middle East nation invested in 63 outward FDI tourism projects, equating to 55% of the market share in the region. It was also the top source market for outward capital investment (\$3.9bn) and created more than 9000 tourism jobs. The UAE was followed by Qatar for outward tourism capital investment and job creation.

#### 4. CONCLUSION

Foreign direct investments in tourism have emerged as a powerful engine for economic growth and job creation. As countries continue to compete for a share of the global tourism market, fostering a conducive environment for foreign investors becomes imperative. By strategically leveraging foreign capital, nations can unlock the full potential of their tourism sectors, spurring economic development and providing employment opportunities that uplift communities and propel nations toward prosperity. Even if the hotel and tourism industry does not enjoy the same prestige as

other, more modern niche industries, its sheer size makes it an extremely valuable sector. According to the United Nations World Tourism Organization (UNWTO), the hotel and tourism industry accounts for 6% of global exports and one in 11 jobs. As data from the Greenfield Investment Monitor fDi Markets shows, investment in hotels and tourism totaled over USD 97.5 billion between 2003 and 2013, attracting more capital than business services (USD 62.9 billion) and pharmaceuticals (USD 58.9 billion). In the same period, investments in this sector created an estimated 38,500 new jobs, twice as many as in the biotech sector. Most new investments in the hotel and tourism sector relate to hotel construction. Companies such as the US hotel giant Marriott International, the French hotel group Accor and the British budget hotel chain Travelodge were among the most productive investors in this sector between 2003 and 2013 in terms of the number of foreign direct investments. But it is not only the hotels that benefit from this flourishing sector. Almost 8,000 jobs created by foreign direct investment in tourism are in sub-sectors such as shared services and customer contact centers. In addition, cross-border investment in the industry creates jobs in other sub-sectors such as design and development, logistics, and retail. From 2013 to 2021, the largest investments in the Asia-Pacific region totaled 103.4 billion, with 996 projects and 187,740 jobs created. Most projects were carried out in China (208), followed by India (119), Singapore and Japan (89). The second largest capital investment in the same period was in Europe, totaling 67.7 billion with the largest number of projects (1317) and 142,423 jobs created. The United Kingdom was the leading destination for foreign direct investment in tourism in Europe between 2013 and 2021 with 285 projects and a market share of 19.57%, followed by Spain with 179 projects and a market share of 12%, and Germany with 171 projects and a market share of 11.74%. Together, the two countries attracted 350 projects and had a market share of 23.74%. Latin America and the Caribbean attracted around 36.6 billion in capital investment with 448 projects and created 158,885 jobs, more than Europe, which recorded more capital investment. The Middle East and Africa attracted 22.2 billion in capital investment with 278 projects and created 62,428 jobs. At 21.5 billion, North America attracted slightly less capital investment than the Middle East and Africa but had more projects than the Middle East and Africa, namely 284 projects with 44,111 jobs created.

Foreign direct investments have emerged as a catalyst for the growth and sustainability of the tourism industry. When managed responsibly, FDI can bring about economic development, job creation, and the enhancement of tourism-related infrastructure.

## References

- Asiedu, E. (2002). On the determinants of foreign direct investment to developing countries: Is Africa different? *World Development*, 30(1), 107–119.
- Bellak, C., Leibrecht, M., & Damijan, J. (2009). Infrastructure endowment and corporate income taxes as determinants of foreign direct investment in central and eastern European countries. *World Economy*, 32(2), 267–290.
- Bevan, A. A., & Estrin, S. (2004). The determinants of foreign direct investment into European transition economies. *Journal of Comparative Economics*, 32(4), 775–787. <https://doi.org/10.1016/j.jce.2004.08.006>
- Cambazoglu, B., & Simay Karaalp, H. (2014). Does foreign direct investment affect economic growth? The case of Turkey. *International Journal of Social Economics*, 41(6), 434–449.
- Casi, L., & Resmini, L. (2010). Evidence on the determinants of foreign direct investment: The case of EU regions. *Eastern Journal of European Studies*, 1(2), 93–118.
- Chakrabarti, A. (2001). The determinants of foreign direct investments: Sensitivity analyses of cross-country regressions. *Kyklos*, 54(1), 89–114.

- Coskun, R. (2001). Determinants of direct foreign investment in Turkey. *European Business Review*, 13(4), 221–227.
- Dhingra, N., & Sidhu, H. (2011). Determinants of foreign direct investment inflows to India. *European Journal of Social Sciences*, 25(1), 21–31
- Dunning, J. H., & Lundan, S. M. (2008). *Multinational enterprises and the global economy* (2<sup>nd</sup> ed.). Edward Elgar Publishing.
- Fdiintelligence. (2018). Tourism Investments 2018, Global greenfield investments trends in tourism, [www.fdiintelligence.com](http://www.fdiintelligence.com) (accessed 15 April 2023).
- Fdiintelligence. (2019). Tourism Investments 2019, Global greenfield investments trends in tourism, [www.fdiintelligence.com](http://www.fdiintelligence.com) (accessed 15 April 2023).
- Fdiintelligence. (2022). Tourism Investments 2022, Global greenfield investments trends in tourism, [www.fdiintelligence.com](http://www.fdiintelligence.com) (accessed 15 April 2023).
- Fdi Markets. (2017). <https://fdimarkets.com>, (accessed 15 March 2023)
- Fdi Markets. (2022). <https://fdimarkets.com>, (accessed 15 May 2023)
- Igošina, V. (2015). FDI to EU15 and new member states: Comparative analysis of inflow determinants. *Prague Economic Papers*, 24(3), 260–273.
- IMF. (1993). *Balance of payments manual: Fifth edition (BPM5)* [Online]. Available at <https://www.imf.org/external/pubs/ft/bopman/bopman.pdf> (accessed 15 November 2022)
- Janicki, H., & Wunnava, P. (2004). Determinants of foreign direct investment: Empirical evidence from EU accession candidates. *Applied Economics*, 36(5), 505–509.
- Leonardo, B., Iulian, P., Adela, S., & Andreea Daniela, M. (2018). Sentiment, perception and policy determinants of foreign direct investment to European developing countries. *Economic Computation and Economic Cybernetics Studies and Research*, 52(2), 69–85.
- Mah, J. S., & Yoon, S. (2010). Determinants of FDI Flows into Indonesia and Singapore. *International Area Review*, 13(1), 63–73.
- Moosa, I. A. (2009). The determinants of foreign direct investment in MENA countries: An extreme bounds analysis. *Applied Economics Letters*, 16(15), 1559–1563.
- Ozkan-Gunay, E. (2011). Determinants of FDI inflows and policy implications: A comparative study for the enlarged EU and candidate countries. *Emerging Markets Finance and Trade*, 47(4), 71–85.
- Rodríguez, X., & Pallas, J. (2008). Determinants of foreign direct investment in Spain. *Applied Economics*, 40(19), 2443–2450.
- Stack, M., Ravishankar, G., & Pentecost, E. (2017). Foreign direct investment in the eastern European countries: Determinants and performance. *Structural Change and Economic Dynamics*, 41(1), 86–97.
- Tang, D. (2017). The determinants of European Union (EU) foreign direct investments in the EU Countries from central and eastern Europe during 1994–2012. *Comparative Economic Research*, 20(1), 75–99.
- Villaverde, J., & Maza, A. (2015). The determinants of inward foreign direct investment: Evidence from the European regions. *International Business Review*, 24(2), 209–223.
- Wei, W. (2005). China and India: Any difference in their FDI performances? *Journal of Asian Economics*, 16(4), 719–736.
- Wijeweera, A., & Mounter, S. (2008). A VAR analysis on the determinants of FDI inflows: The case of Sri Lanka. *Applied Econometrics and International Development*, 8(1), 189–198.
- WTO. (1996). *News—‘Trade and foreign direct investment’* [Online]. Available at [https://www.wto.org/english/news\\_e/pres96\\_e/pr057\\_e.htm](https://www.wto.org/english/news_e/pres96_e/pr057_e.htm) (accessed 15 August 2022).
- Zheng, P. (2009). A comparison of FDI determinants in China and India. *Thunderbird International Business Review*, 51(3), 263–279.





# Development of a Tourist Experience Model with the Aim of Increasing Economic Efficiency – On the Example of the Destination Sofia

Irena Emilova<sup>1</sup>   
Margarita Misheva<sup>2</sup>   
Violeta Doneva-Yankulova<sup>3</sup> 

Received: August 30, 2023  
Revised: November 28, 2023  
Accepted: December 20, 2023  
Published: March 16, 2024

## Keywords:

Model;  
Economic efficiency;  
Development;  
Experiences;  
Sofia;  
Destination



Creative Commons Non Commercial CC BY-NC: This article is distributed under the terms of the Creative Commons Attribution-Non-Commercial 4.0 License (<https://creativecommons.org/licenses/by-nc/4.0/>) which permits non-commercial use, reproduction and distribution of the work without further permission.

**Abstract:** *The research examines current trends in destination development and the increasing demand for services that create experiential value through additional services and travel opportunities. This pursuit of experiences aims to facilitate rejuvenation, capitalizing on the abundant tourism resources, exemplified by Sofia city.*

*Objective: This study aims to construct a comprehensive tourism experiential model for the given destination, employing an integrated approach that harnesses the untapped potential of various resources within the tourist area. The primary goal is to enhance the destination's economic efficiency. This approach envisions multifaceted benefits, including bolstering the tourism sector, contributing to GDP growth, and fostering sustainable advancement for urban destinations. Furthermore, it aims to foster year-round growth in demand and supply for tourist products and services in Sofia. The focal point lies in exploiting the destination's developmental prospects, fueled by evolving consumer preferences, driven by the quest for authentic and distinct travel experiences.*

## 1. INTRODUCTION

This study delves into the diverse array of tourist resources in Bulgaria's capital, offering an avenue to overcome the seasonal constraints of tourism and reinforce the destination's unique identity. Within the purview of economic evaluation, a comprehensive endeavor is undertaken to unveil the rationale underlying the attainment of economic efficiency. This is achieved through the creation of a destination-specific model for tourist experiences utilizing an integrated approach. **Methodology:** To accomplish the stipulated objectives and attendant tasks, this study employs a systematic approach in conjunction with various research methods. These include historical, comparative, analysis and synthesis methods, observation, grouping, survey, differentiated, analytical, and combined methods. The research's contribution aligns with the established objective, focusing on fostering the growth of urban destinations as Smart Destinations. Furthermore, it raises the inquiry into augmenting tourism revenue and enhancing GDP contributions through long-term industry management strategies within an urban milieu.

By adopting an approach that identifies and integrates diverse tools for destination marketing management, with an emphasis on experiences and branding, Sofia aspires to establish itself as a recognizable four-season destination catering to emotional tourism and experiences. The integrated destination management approach engenders an environment conducive to enhancing its allure by capitalizing on its diverse tourism resources. The dimension of experience generation

<sup>1</sup> New Bulgarian University, ZIP 1618 Sofia, Bulgaria 21 Montevideo str, Bulgaria

<sup>2</sup> New Bulgarian University, ZIP 1618 Sofia, Bulgaria 21 Montevideo str, Bulgaria

<sup>3</sup> New Bulgarian University, ZIP 1618 Sofia, Bulgaria 21 Montevideo str, Bulgaria

now extends beyond an artistic pursuit to an economic one. This evolution is underscored by the introduction of emerging technologies and the increasingly intricate and interconnected channels for delivering experiences, often tied to goods and services production. **Findings:** The application of the developed model is contingent on the holistic development and strategic management of the destination (as exemplified by Sofia). The model's specialized focus resides in the realm of the experience economy. Despite its substantial potential, Destination Sofia's resources in fields like business, health, sports, shopping, and balneological tourism remain underdeveloped. An opportunity exists to synergize these domains and position Sofia as a year-round, economically viable tourism destination.

## 2. URBAN TOURISM – DESTINATION SOFIA

On a global scale, urban tourism presents itself as a multifaceted phenomenon. It addresses the leisure-oriented desires of travelers who seek to explore diverse cities worldwide, immerse in novel cultures, and partake in recreational endeavours (Emilova, 2017). The concept of urban tourism embodies the unimpeded engagement in cognitive, business, and recreational pursuits within urban boundaries (Ashworth, 2008). This concept captures the administrative and statistical aspects of tourism offerings within urban settings. Urban tourism, functioning as a demographic, social, and economic process, correlates with the escalating prominence of cities. These urban centers, housing a substantial portion of the population, offer tourism services at elevated quality standards (Emilova, 2017).

The term "urban tourism" envelops the entirety of tourist journeys to prominent global cities, many of which have transformed into tourist hotspots. The World Tourism Organization (WTO) characterizes urban tourism as encompassing all voyages embarked upon by tourists to cities or locations characterized by high population density. Typically, such trips are of brief duration, lasting between one to three days, thus establishing a clear link between urban tourism and the realm of short-term travel (Emilova, 2017).

As urban travel advances, a corresponding evolution in tourist consumption patterns emerges. Present-day consumer demands exhibit entirely distinct dimensions. To fulfill these demands within the realm of tourist consumption, it becomes imperative to offer experiences that are both authentic and distinctive. Achieving this necessitates an innovative and creative approach to crafting tourist products within destinations that align with contemporary consumer expectations (Emilova, 2020).

Placing experiences at the epicenter of tourist consumption brings to light the imperative to discern economic efficiency and its potential to be harnessed within the urban context, leveraging the available tourist resources and scrutinizing the prevailing consumption of tourist products. Economic efficiency serves as the yardstick for gauging development levels and evaluating sectoral quality attributes. It revolves around orchestrating the creation of a tourist product that optimally integrates and allocates limited resources to ensure profitability within market dynamics. The rational utilization of resources materializes through an allocation strategy that maximizes outcomes. Efficiency is quantified by juxtaposing the economic outcomes of tourism activities against the costs or resources invested to achieve them.

**Clarification of Tourist Resources in Sofia Destination:** The tourist destination of Sofia boasts a rich array of both natural and human-made attractions. Among the natural resources

are the nearby mountain ranges, mineral springs, diverse flora and fauna, as well as tangible and intangible cultural heritage. These resources are elucidated in greater detail below:

- **Natural Abundance:** In the context of tourism, the proximity of Vitosha Mountain emerges as a pivotal feature. Its highest summit, Cherni vrah (2290 m), offers opportunities for both hiking and skiing tourism. Vitosha Nature Park is officially designated as a local climatic mountain resort. Encompassed within its borders are two reserves, "Torfeno Branishte" and "Bistrishko Branishte," along with several natural marvels including Boyanski Waterfall, Samokovishte—a waterfall on the Bistrica River—and the extensive Duhlata Cave (the longest cave in Bulgaria, located in the Pernik region). Additional mountains within the municipality offer traditional ecotourism routes. These routes intertwine recreational pursuits with cognitive, cultural, and pilgrimage tourism, attracting predominantly the metropolitan population. However, these areas hold untapped potential for sports and attractions, awaiting more comprehensive utilization. This clarification underscores the multifaceted natural resources present within Sofia, underpinning its appeal to a diverse range of tourists.
- **Mineral Waters and Springs:** The Sofia destination boasts an extraordinary wealth of mineral waters, encompassing a remarkable assemblage of 30 springs, each characterized by a diverse array of properties and untapped potential. Prominent springs are found in locations including Bankya, Zheleznitsa, Pancharevo, Sofia-center, Svoboda, Kniazhevo, and Gorna Banya deposits. Particularly noteworthy are the springs in the heart of Sofia, Bankya, and Pancharevo. Notably, Bankya holds the status of a spa resort of national importance, while Pancharevo is designated as a spa resort of local significance. Notably, within the city's precincts is the National Specialized Hospital for Physical Therapy and Rehabilitation. This historic medical institution stands as the oldest of its kind in the region, serving as the bedrock for advancements in physical medicine, rehabilitation, and resort science within Bulgaria (Ianeva et al., 2022). Augmenting these resources are the water bodies within the Capital Municipality. The Iskar Dam and Pancharev Lake present ideal settings for water sports enthusiasts, offering opportunities for rowing, windsurfing, and sport fishing. These locales further provide favorable circumstances for merging recreation and treatment, capitalizing on mineral waters, a mountain microclimate, and well-suited walking and cycling routes. In synthesis, the diversified climatic, geological, and hydrological conditions, along with the distinctive flora and fauna, contribute to the rich array of landscapes, biological species, communities, and essential natural habitats. This collective treasure trove represents an invaluable reservoir for tourism development and the preservation of biodiversity of pan-European significance (NSRD (National Strategy for Regional Development) 2012-2022, 2012).
- **Cultural Heritage:** Within the confines of the Metropolitan Municipality, a mosaic of cultural heritage encompasses over 1,400 immovable cultural assets, registered following the Law on Cultural Heritage (State Gazette No. 19, 13.03.2009). This treasure trove spans various epochs, with a significant portion comprising architectural and construction marvels from the Renaissance through to the mid-20th century. Among the most salient are archaeological gems, including registered settlements spanning prehistory to the late Middle Ages. These encompass sanctuaries, fortresses, temples, necropolises, and numerous burial mounds.

Among these, 13 individual objects (such as Vrana Palace, Seslav Monastery, Boyan Church, and more) and 2 group sites (Central Historical Core of Sofia and Borisova Garden) have earned inclusion in the Register of the World and national importance—a total of 165 such sites in

Bulgaria. Of special note are the well-preserved remnants of ancient Serdika and medieval Sredets, some of which have been meticulously restored and displayed within the city's central precincts. The most iconic site, St. Alexander Nevsky Cathedral, emblematic of the capital, also beckons tourists.

Moreover, three reserves, including "Serdika – Sredets," Boyanska Church, and Borisova Garden, feature on the landscape as territories meriting heightened territorial planning protection. Among these, the Church of Boyana, listed as No. 42 on UNESCO's World Cultural and Natural Heritage roster, is the sole representative of the Capital Municipality. The frescoes adorning the Rotunda "St. George" and the Kremikovsky Monastery church stand out as exceptionally preserved specimens of medieval Bulgarian artistry.

In addition, public gardens like Alexandrovska (now the city garden) and Borisova Garden, as well as the "Vrana" park, are all cultural heritage entities, emblematic of the late 19th-century urban evolution. The [Metropolitan Municipality \(2009\)](#) is also home to a constellation of 27 museums, 4 state cultural institutes centered on music and dance, 6 institutes devoted to theatrical arts, and 4 municipal theaters. The cultural landscape is further enriched by 4 national, 3 municipal galleries, and numerous private art galleries, alongside a vibrant network of over 120 community centers. Within the realm of intangible cultural heritage, the group known as the "Bistryka grandmothers" is a distinctive presence.

In sum, the cultural heritage of Sofia is an intricate tapestry woven through centuries, offering a myriad of enriching experiences for tourists and locals alike.

**Fostering Sofia as an Emblematic Smart Destination:** The evolution of Sofia as a distinct urban and cultural tourism hub necessitates the cultivation and promotion of iconic urban locales rooted in its wealth of tourism resources. Establishing a resonant, genuine, and favorable image of Sofia stands as a foundational prerequisite for competitive positioning within global tourist markets. The overarching aspiration is for Sofia to ascend as a preeminent regional and international tourist magnet—offering resonant and transformative tourist encounters, underpinned by a rich historical and cultural backdrop, coupled with elevated service standards.

This vision seamlessly aligns with the concept of Smart Destination, as delineated by the European Union. At its core, this approach entails facilitating tourism and hospitality offerings, spaces, and experiences through the strategic deployment of Information and Communication Technologies (ICTs). Such investment bolsters the city's intellectual capabilities and augments visitor engagement, ultimately benefiting businesses and individuals by fostering more streamlined infrastructure and service delivery.

Notably, the centrality of experiences in driving the tourism sector and shaping tourists' contentment and intent to revisit is paramount. This aspect poses a critical challenge for destination management organizations, necessitating a profound exploration of the underlying motives prompting travel. This elucidation forms the bedrock for enhancing the provisioning of positive tourism experiences ([Buhalis & Amaranggana, 2015](#)).

Contrary to conventional paradigms, experiential value doesn't solely emanate from service providers or tourists themselves. It finds its genesis within a broader social and spatial framework ([Hoarau & Kline, 2014](#)). Additionally, experiences can germinate during the service process,

but remain beyond an organization's direct control (Juttner et al., 2013), maturing at any juncture during the interactive engagement (Mascarenhas et al., 2006).

Furthermore, travel transpires as a creative process, enabling tourists to amplify their experiences by immersing in local cultures (Richards & Wilson, 2007). These encountered locales and cultures serve as conduits linking tourists to various stakeholders – ranging from service providers and governments to local communities. Collectively, they mediate the experiential process, intertwined with tourists' visits, by actively participating in tourism management (Wang et al., 2012).

In a rapidly evolving landscape, the trajectory of tourism remains unpredictable—an amalgamation of technology, communication, velocity, and sentiment. It is technology that propels this swift metamorphosis. Tourist cities, endowed with multifarious experiential prospects during visits, pave the way for myriad developmental avenues worth exploration (Emilova, 2021). This journey toward elevated urban tourism, backed by technological progress, stands emblematic of the remarkable transformation currently unfolding in Sofia.

**The Imperative for Comprehensive Resource Analysis in Facilitating Tourist Experiences in Sofia:** From the discourse thus far, it becomes evident that meticulous and rigorous scrutiny of Sofia's potential resources and avenues for delivering immersive tourist experiences is paramount. This necessitates an in-depth exploration of the diverse opportunities Sofia can harness to cater to tourists seeking captivating encounters.

With regard to dissecting visits to Sofia, insights from the *Global Metrics research (2021)* underscore that a substantial majority of foreign tourists (70%) partake in a solitary visit to the destination, with a mere 5% to 14% venturing back for repeated visits (ranging between one to three times). This dynamic suggests a susceptibility to sustaining interest and cultivating return visits—an incongruity vis-à-vis contemporary destination development trends that underscore the significance of nurturing tourist loyalty and boosting economic efficacy. Moreover, Sofia continues to maintain a comparatively budget-friendly standing in comparison to other European Union capitals, gauged by average overnight prices.

Preceding the pandemic's onset, the trend conspicuously portrayed a predominance of tourists embarking on leisure and sightseeing trips. However, in the post-pandemic epoch, there has been an observable shift, with a growing share of tourists pursuing visits or transit. Notably, a profound potential is discernible in attracting business-oriented tourists, and Sofia possesses substantial infrastructure assets to this end. Enriching access to mountainous terrain and mineral springs could also contribute to enhancing the diversity of experiences for business travelers. The city's allure lies in its exceptional fusion of historical artifacts spanning diverse epochs, architecture exemplifying manifold styles, urban and suburban attractions, and auditory and gustatory pleasures—ultimately culminating in a harmonious amalgamation of ancient heritage and contemporary vitality, a bridge between Eastern and Western cultures.

In summation, the venture to craft profound, memorable, and diverse experiences for tourists in Sofia necessitates a scrupulous analysis of the city's inherent potential. This approach entails not only the accentuation of Sofia's captivating historical and cultural richness but also an intricate weaving of contemporary amenities and accessibility into the visitor experience—a journey that aligns with the aspirations of the city to perpetuate its reputation as an iconic, magnetic, and unforgettable destination.

**The Multifaceted Tapestry of Sofia's Urban Spaces – A Canvas for Authentic Experiences:** Viewed through the prism of Sofia's spatial diversity, a rich tapestry of parks and gardens, some adorned with remarkable flora, beckons. This verdant landscape intersects with the strata of diverse cultures that bear witness to the ancient history that has shaped the city. Additionally, the city is ensconced by mountains, offering vistas that beckon exploration, although accessibility remains an avenue for potential enhancement. Further accentuating this panorama are the myriad contemporary dining and entertainment establishments, fostering a vibrant nightlife and gastronomic exploration. The retail landscape adds to this allure, offering ample opportunities for shopping tourism. Through this nuanced analysis, it becomes evident that Sofia represents a captivating blend of epochs and styles, unveiling breathtaking vistas that facilitate boundless opportunities for authentic experiences within an urban milieu.

Sofia's allure as a tourist hotspot, in turn, substantially influences its appeal for scientific and business pursuits. The cityscape boasts a slew of business hotels, primarily nestled in the heart of the metropolis, while numerous international corporations also maintain their presence within the country. An imperative herein is the implementation of incentivizing measures to prolong tourist stays, augment individual expenditures, and elevate the city's profile. In the context of economic efficiency, it becomes crucial to outline a vision for the city's management in the sphere of sustainable tourism development. This might involve contemplating the balance between catering to a larger influx of mass tourists or focusing on a smaller, yet higher-spending demographic characterized by prolonged stays. Notably, the fundamental tenets outlined in the sectoral Strategy for Sofia's tourism development spanning 2017 to 2030 ([National Development Programme Bulgaria 2030, 2020, p. 111](#)) are closely tied to the pursuit of long-term economic efficacy. These guiding principles underscore the importance of sustainable practices, environmental stewardship, social compatibility, democratic participation, transparent decision-making, partnerships, and fostering a distinctive local identity, interwoven with community and regional values.

In sum, the mosaic of Sofia's urban spaces encompasses not only geographical landscapes but also cultural narratives, echoing epochs and legacies, making it an alluring tableau for a diverse array of experiences. The city's potential as a thriving tourism destination intrinsically intertwines with its appeal as a hub for scholarly pursuits and business endeavors, emphasizing the need for strategic vision to ensure that the pursuits of all these facets harmonize and amplify Sofia's allure on the global stage.

**Harnessing Bulgaria's Tourism Potential – A Blueprint for Sustainable Growth:** Undoubtedly, the National Strategy for the Sustainable Development of Tourism in Bulgaria 2014-2030 demands our attention, as it charts a course for the nation's tourism trajectory. This blueprint underscores the pivotal role played by Bulgaria's multifaceted tourism opportunities in fueling its progress. Foremost among its imperatives is the cultivation of distinct identities for individual locales through branding. This approach is envisioned to bolster the recognition of each region among current and prospective tourists, fostering a deep-seated emotional bond between the locale, the nation, and the visitor.

This strategic focus on positioning and marketing holds the potential to catalyze a profound connection, nurturing a sense of place and cultural resonance. Notably, it stands to enhance the efficacy of both strategic planning and tactical initiatives in advertising and promotion. By tailoring these efforts to specific tourism niches and targeting discerning market segments, a

harmonious interplay between destination appeal and visitor preference can be achieved. This finely calibrated approach accommodates segmentation both by country and by interests, thus aligning tourism offerings with diverse consumer needs.

In this continuum of strategic initiatives, the marketing strategy for the Sofia tourist region for 2021-2024 unfurls an ambitious vision ([National Development Programme Bulgaria 2030, 2020, p. 111](#)). This vision outlines the pursuit of a prominent standing on the European and global cultural calendar. The overarching goal is to establish the Sofia tourist region as an irresistible cultural and distinctive destination, characterized by year-round availability of both business and cultural tourism. Central to this identity is Sofia's captivating amalgamation of diverse eras, styles, landscapes, resonant sounds, and flavors.

In essence, these strategies underscore a meticulous orchestration, whereby Bulgaria's tourism potential is harnessed through strategic branding and targeted marketing. This integrated approach seeks not only to showcase the nation's cultural richness but also to foster an enduring connection between visitors and the myriad treasures Bulgaria offers, thus propelling sustainable tourism growth on both the regional and global stages.

### 3. THE POWER OF EXPERIENCES IN MODERN TOURISM

In the contemporary landscape of tourism, destinations are actively embarking on initiatives to craft compelling attractions aimed at luring visitors. This strategic pursuit is geared towards diversifying the tourist experience and curating a distinct product that resonates with consumers. In a world characterized by globalization, the quest for a unique identity and unparalleled encounters has impelled destinations to innovate, fabricate, and establish novel concepts, sites, facilities, and experiences that are readily identifiable and enticing. In today's context, it is paramount for destinations to offer an exclusive tourism offering that can only be "experienced" within their specific boundaries ([Misheva, 2019](#)).

Gone are the times when tourism revolved solely around leisure or business ventures. In the contemporary milieu, the driving forces behind travel motivation are intrinsically linked to the pursuit of authentic, unfiltered experiences. Tourist journeys have transcended the conventional notion of visiting desired landmarks; they have evolved into vehicles for uncovering the unfamiliar, embracing the exotic, and empathizing with foreign cultures and societies. Modern visitors increasingly yearn to actively partake in the everyday lives of local inhabitants, immersing themselves in their customs and lifestyles. This shift necessitates an innovative, creative approach to tourism management, particularly within the realm of experiential travel. Here, the emphasis lies in forging diverse avenues, business models, and lasting assets for the industry.

Integral to this paradigm is the concept of experience, which is intimately interwoven with knowledge, memories, and emotions. Often eluding precise description, the experience transcends mere physical and sensory perception, making it a profound and cherished aspect of travel. It is profoundly influenced by the quality of the product and how it is conceived. From interactions with local culture and guides to impressions of the destination, these elements coalesce to shape an experience that imparts added value to the journey. The tactile engagement with artifacts, the reenactment of historical events, the narratives shared by locals, and their traditional crafts – all contribute to etching lasting memories in the minds of travelers. Crafting these experiences is a multifaceted and subjective endeavor that lies at the core of the tourism product ([Emilova, 2021](#)).

In essence, the contemporary tourism landscape is undergoing a transformative shift towards a more experiential dimension. Destinations are no longer mere locales to visit; they are immersive playgrounds for cultivating memories, forging connections, and engaging with cultures. This strategic pivot underscores the profound impact of experiential travel on the industry, where the intangible and the unforgettable take precedence over conventional tourism paradigms.

**Constructing a Conceptual Model of Tourism Product Core in Sofia: Embracing Experiences (Fig. 1):** The development of a robust conceptual model that forms the nucleus of Sofia's tourism product, firmly rooted in enriching visitor experiences (refer to Figure 1), thrives on the dynamic interaction and collaborative efforts of all vested stakeholders, each wielding a direct and/or indirect impact on the city's tourism evolution.

Central to this construct is the branding of the tourist destination and the seamless digitization of the tourism product. This pivotal foundation draws inspiration from an array of strategic blueprints and initiatives, orchestrated by the public sector including the Ministry of Tourism, allied tourist associations and organizations, and the bustling local tourism industry. The seamless integration of these facets is pivotal in engineering a compelling identity for Sofia within the global tourism marketplace.

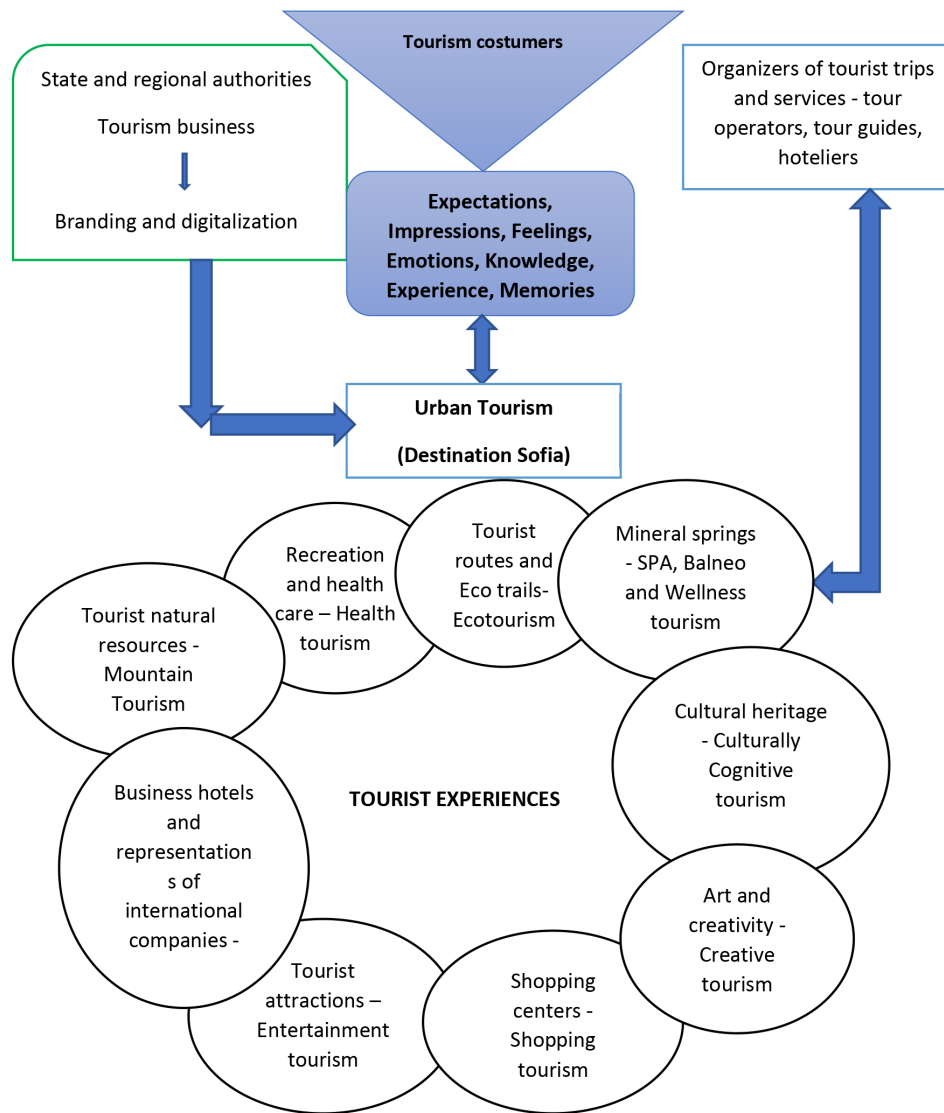
Crucially, the triumphant positioning of Sofia as an irresistible destination on the international stage is intricately intertwined with the shifting inclinations and desires of contemporary travelers, particularly Generation Z. This cohort is characterized by their penchant for immersive explorations, extended stays, and a pronounced impact on destination image through their extensive engagement on social media platforms. Notably, digital nomads, often extending their tenure in locales, play a dual role by actively partaking in destination promotion while simultaneously luring other travellers to follow suit.

**Constructing the Core of Sofia's Tourism Product through Experiences and Collaboration:** At the heart of this dynamic model lies the mutual collaboration between multifaceted contributors – the public sector, local businesses, technology-driven platforms, and the evolving preferences of travelers. Their interplay shapes Sofia into an alluring magnet for travelers who seek more than mere sightseeing – they yearn for memorable, immersive encounters that resonate deeply, influencing both the destination and its visitors.

To ensure the utmost satisfaction during a sojourn in a particular destination, it is imperative to engage all facets of a tourist's senses and, concomitantly, evoke a symphony of emotions. By orchestrating this sensorial symposium, an unparalleled voyage is curated, nurturing both an unforgettable experiential odyssey and a flourishing, financially viable tourist enterprise.

The essence of tourism experiences transcends mere fleeting moments; rather, they unfold across multiple strata, akin to an intricately woven tapestry. This art of crafting experiences typically unfolds across three pivotal stages: the emotional crescendo leading up to the journey, the immersive encounters during the expedition, and the poignant epilogue as the expedition concludes. Collectively, this journey through emotional landscapes constitutes the complete tapestry of the tourist's experience. Intriguingly, it is often observed that travellers often hold these experiences in greater esteem after they return to their abodes, reminiscing and relishing in the tapestry of memories woven.





**Figure. 1.** Conceptual model of the tourist experience in destination Sofia

Source: Authors

Notably, these experiences serve as a reservoir of impressions, akin to a sonic record, enabling tourists to juxtapose, contrast, and contextualize their encounters. It is these records that sculpt their expectations and mold their travel aspirations, acting as the catalyst for future voyages. Provoking a whirlwind of emotions in tourists, through compelling narratives, profound connections, indelible memories, and surprises, encapsulates the bedrock of crafting compelling tourist experiences. As they journey back home with these intangible treasures, they become storytellers in their own right, sharing their authentic, unfiltered impressions with friends and family, cementing the allure of their experiences.

**Crafting a Multisensory and Emotion-Stirring Tourist Experience:** Intricately intertwining sensory engagement and emotional resonance, the touristic sojourn transforms into a poignant voyage of the senses and sentiments. Such multi-layered experiences, echoing in the hearts and tales of the travelers, epitomize the pinnacle of successful and captivating tourism.

The rapidly evolving experience economy within the realm of tourism services underscores consumers' pursuit of enduring memories, emotions, and symbolism that coalesce into

comprehensive and lasting personal encounters (Prayag et al., 2017). This dynamic signals the obsolescence of traditional marketing paradigms that focus solely on functional attributes and product quality (e.g., Schmitt, 2009; Gentile et al., 2007; Emilova, 2020)

It is noteworthy that tourists navigate a unidirectional, pre-structured flow of images and information before, during, and after their experiences. Framed within the purview of travel agencies, the potential unfolds for an entertainment and/or discovery model that inherently acknowledges the active role tourists play in shaping and orchestrating their experiences. Experience design emerges as an interplay involving tourism agencies, entities, municipalities, local authorities, and the very consumers partaking in the tourism journey. A systematic comprehension of tourists' spatial trajectories and the diverse array of activities they engage in becomes pivotal for urban planners in the tourism sector. This encompasses discerning where and when tourists traverse the landscape. While various studies suggest that many tourists predominantly adhere to pre-defined routes delineated in guidebooks, this should not be taken at face value when gauging urban events. Thus, it becomes imperative to scrutinize tourists' behaviors and intentions before, during, and after their experiences. Such scrutiny fosters a symbiotic connection and interaction between the experiential creation (management) and consumption facets of the tourism spectrum (Emilova, 2022).

#### **4. FUTURE RESEARCH DIRECTIONS**

Future research endeavours stemming from this study could delve into the exploration and establishment of correlations and interdependencies between the offered tourist product within Sofia as a destination and the prospects for expanding the tourist market. This expansion could be facilitated through the introduction of novel destinations by existing airlines or the entry of new carriers operating at Sofia Airport.

#### **5. CONCLUSION**

The variety of experiences accessible through tourism in Sofia, Bulgaria is fundamentally woven from the rich concentration of natural and cultural tourism resources, an intricate cultural heritage, business and shopping recourses captivating itineraries within the surrounding areas, a multitude of entertainment venues and tourist attractions, and a canvas of opportunities for engaging in creative and health-centric recreational activities.

Our analysis findings have unequivocally underscored the value of diversifying tourism products and experiences to magnetize a diverse spectrum of tourists, consequently fostering robust and sustainable economic outcomes. The integration of tailored tourist routes, events, and programs tailored to specific tourist segments lends itself to optimal resource utilization within the destination and a consequential surge in tourism-generated revenue.

In summary, the integrated approach to crafting tourism experiences within Sofia, Bulgaria emerges as a potent paradigm for augmenting the economic yield of the destination. This synergy between distinctive attractions and tourists' desires serves as a potential blueprint for not only the evolution and enhancement of the tourism sector within other locales but also the orchestration of an intimate relationship between sustainable tourism growth and the preservation of the local cultural and natural milieu.

In closing, the framework of integrated tourism experiences nurtured in Sofia stands as a compelling model for catalyzing the economic potency of a destination by intertwining distinctive allurements with tourist demands. This model stands poised to not only inspire the evolution and enrichment of the tourism sector in other urban and regional settings but also underscore the importance of the symbiotic connection between sustainable tourism expansion and the guardianship of the indigenous cultural and environmental fabric.

## References

- Ashworth, G. J. (2008). Urban Tourism: Reflections on an Emerging Field. In M. Smith & G. J. Ashworth (Eds.), *The Study of Tourism: Anthropological and Sociological Beginnings* (Vol. 2, pp. 97-117). Routledge.
- Buhalis, D., & Amaranggana, A. (2015). Smart Tourism Destinations Enhancing Tourism Experience Through Personalisation of Services. *Information and Communication Technologies in Tourism*, 377-389. [https://doi.org/10.1007/978-3-319-14343-9\\_28](https://doi.org/10.1007/978-3-319-14343-9_28)
- Emilova, I. (2020). The invisible part of generating experiences. <https://plus.cobiss.net/cobiss/bg/bg/bib/nbkm/45264136#full>
- Emilova, I. (2020). The new experiences in tourism. UNWE.
- Emilova, I. (2021). The economy of experiences in a tourism context. Yearbook of the Department "Administration and Management", item 6.
- Emilova, I. (2022). Designing tourism experiences. Veliko Tarnovo.
- Emilova, V. (2017). Urban Tourism: Complex Phenomenon on an International Scale. *Journal of Tourism & Hospitality Management*, 5(3), 123-135.
- Gentile, C., Spiller, N., & Noci, G. (2007). How to Sustain the Customer Experience. *European Management Journal*, 25(5), 395-410. <https://doi.org/10.1016/j.emj.2007.08.005>
- Global Metrics. (2021). Survey of foreign tourists, September 2021.
- Hoarau, J., & Kline, C. (2014). *Values and concern: Drivers of innovation in experience-based tourism*, Volume 19, Issue 1, <https://doi.org/10.1177/1467358416683>
- Ianeva, M., Basmadzhieva, S., Doneva, V., & Georgieva, R. (2022). Consulting Assessment of the Potential for Development of Health Tourist Areas: The Case of Bulgaria. In *Tourism & Hospitality Industry 2022, Congress Proceedings* (pp. 97-112). <https://doi.org/10.20867/thi.26.17>
- Juttner, U., Schaffner, D., Windler, K., & Maklan, S. (2013). Customer service experiences: Developing and applying a sequential incident laddering technique. *European Journal of Marketing*, 47(5/6), 738-769. <https://doi.org/10.1108/03090561311306769>
- Mascarenhas, O. A., Kesavan, R., & Bernacchi, M. (2006). Lasting customer loyalty: a total customer experience approach. *Journal of Consumer Marketing*, 23(7), 397-405. <https://doi.org/10.1108/07363760610712939>
- Metropolitan Municipality. (2009). Metropolitan Municipality Environmental Protection Program 2010-2020, Part I. Environmental Protection Act. <https://www.moew.government.bg/en/environmental-protection-act-7628/>
- Misheva, M. (2019). Tourist attractions - role and importance for destinations. Yearbook of the "Administration and Management" Department, item 4, NBU.
- National Development Programme Bulgaria 2030. (2020). <https://www.mtc.government.bg/sites/default/files/nationaldevelopmentprogrammebulgaria2030-en.pdf>
- NSRD (National Strategy for Regional Development), 2012-2022. (2012). <https://www.mrrb.bg/bg/national-regional-development-strategy-of-the-republic-of-bulgaria-2012-2022/>
- Prayag, G., Hosany, S., Muskat, B., & Del Chiappa, G. (2017). Understanding the Relationships between Tourists' Emotional Experiences, Perceived Overall Image,

- Satisfaction, and Intention to Recommend. *Journal of Travel Research*, 56(1), 41-54. <https://doi.org/10.1177/0047287515620567>
- Richards, G., & Wilson, J. (Eds.). (2007). *Tourism Development Trajectories: From Culture to Creativity? Tourism, Creativity and Development*, Routledge, London.
- Schmitt, B. (2009). Customer Experience Management. *Handbuch Kommunikation*, 697-711. [https://doi.org/10.1007/978-3-8349-8078-6\\_33](https://doi.org/10.1007/978-3-8349-8078-6_33)
- State Gazette No. 19, 13.03.2009. ENVIRONMENTAL PROTECTION ACT.
- Wang, Y., Naumann, U., Wright, S. T., & Warton, D. I. (2012). mvabund- an R package for model-based analysis of multivariate abundance data. *Methods in Ecology and Evolution*, 3(3), 471-474. <https://doi.org/10.1111/j.2041-210x.2012.00190.x>

### Additional reading

- Emilova, I. (2023). Socio-cultural dimensions of urban tourism in the context of an experience economy. In Collection of scientific reports from the VI International Scientific and Practical Conference "Sociocultural Codes of Modern Development" - Plovdiv, 2023.
- National Strategy for Sustainable Tourism Development in the Republic of Bulgaria 2014-2030 and Action Plan 2017-2020 – November 2019.



# Digital Experience Scale Development: An Application in Rural Heritage Tourism

Suzana Marković<sup>1</sup>   
Sanja Raspor Janković<sup>2</sup> 

Received: November 29, 2023  
Accepted: December 29, 2023  
Published: March 16, 2024

## Keywords:

Digital experience dimensions;  
Scale development;  
Experience measurement;  
Rural heritage tourism



Creative Commons Non Commercial CC BY-NC: This article is distributed under the terms of the Creative Commons Attribution-Non-Commercial 4.0 License (<https://creativecommons.org/licenses/by-nc/4.0/>) which permits non-commercial use, reproduction and distribution of the work without further permission.

**Abstract:** *By using qualitative and quantitative research approaches, this study aims to develop a measurement scale for evaluating digital experience in the context of heritage tourism. The three-step procedure was used to conceptualize, create, and validate a digital experience scale. Conceptualization is based on key digital experience dimensions extracted from the literature review. The developed digital experience scale consists of seven dimensions: expectation confirmation, perceived enjoyment/entertainment, engagement, perceived ease of use, education, escapism, and aesthetics. The scale was tested in a small heritage site located in a rural tourist destination in Croatia. The results show adequate reliability and validity of the measurement scale, implying its applicability in future research on the digital experience of heritage visitors. Therefore, this study extends the experience measurement literature and adds to the knowledge of digital technology implementation in small rural heritage sites.*

## 1. INTRODUCTION

Many cultural heritage sites have implemented new digital technologies (e.g. virtual and augmented reality) to innovate their products and services, and to enrich the visitor experience. What is more, the rapid development and increasing implementation of digital technologies in the leisure context resulted in the need to explore their nature and implications within the user experience scope.

Previous research found that digital technologies enhance the tourist experience (e. g. Jung et al., 2016). What is more, digital technologies like virtual and augmented reality have the potential to create immersive heritage tourism experiences. In this vein, Bec et al. (2019) demonstrated that integrating history with cutting-edge technology enriches visitor experience and subsequent engagement with history. In addition, Han et al. (2017) found that augmented reality benefits cultural heritage tourism, while Han et al. (2019) put forward the importance of using the latest technologies in enhancing the cultural tourism experience.

Since experiences are service/product specific, and depend on the context, it is important to know service/product factors that contribute to user experience in a particular environment. What is more, tom Dieck and Jung (2018) revealed the necessity of exploring context-specific factors to increase the success of technology adoption. Following this approach, it is important to explore digital experience features in small and less developed tourism destinations (e.g. rural destinations), to better understand the effects that new technologies have on visitor experience in this specific context.

<sup>1</sup> University of Rijeka, Faculty of Tourism and Hospitality Management, Primorska 42, 51410 Opatija, Croatia

<sup>2</sup> Polytechnic of Rijeka, Trpimirova 2/V, 51000 Rijeka, Croatia

There has been increasing research that focused on digital technology applications in the heritage context. However, Han et al. (2017) concluded that research regarding the tourist experience is still limited and lacks both theoretical and empirical studies. Similarly, Trunfio et al. (2019) pointed out that research on how new technologies impact visitor experience is mainly conceptual and in its early stage of development. Particularly, Liu (2020) noted that the measurement framework for digital experience is lacking.

Therefore, in an attempt to address previously identified gaps in experience measurement literature, this study aims to develop a measurement scale for evaluating digital experience, focusing on small heritage sites located in rural environments.

## 2. DIGITAL EXPERIENCE: CONCEPTUALIZATION AND SCALE DEVELOPMENT

Digital technologies are creating an environment where real and virtual elements are mixed in different ways. Currently, literature distinguishes between the following types of new digital technologies, namely virtual reality, augmented reality, and mixed reality. According to Weber Sabil and Han (2021), virtual reality (VR) fully immerses the user into a computer-simulated environment, augmented reality (AR) enhances real-world vision through the overlay of computer-generated content, while mixed reality (MR) merges the real world with the virtually generated content into creating a third viewing dimension, where both realities can interact with each other in real-time.

Due to these features, implementing digital technologies in the tourism industry changes tourism services and products, and affects tourist experience by creating new types of experiences. In the context of tourist interaction with digital devices, digital experiences are formed. Thus, it is important to understand the attributes that describe the digital experience concept.

Based on the literature review on digital experience, the main digital experience features in the cultural and heritage context were identified from past empirical research, as presented in Table 1.

**Table 1.** An overview of digital experience dimensions

Reference	Research context	Digital experience dimensions
Jung et al. (2016)	Museum in the United Kingdom	<ul style="list-style-type: none"> <li>• Education experience</li> <li>• Aesthetics experience</li> <li>• Entertainment experience</li> <li>• Escape experience</li> </ul>
Chung et al. (2017)	Cultural heritage site in South Korea	<ul style="list-style-type: none"> <li>• Expectation confirmation</li> <li>• Perceived advantage</li> <li>• Aesthetic experience</li> <li>• Perceived enjoyment</li> </ul>
Jung et al. (2018)	Cultural heritage site in South Korea and museum in Ireland	<ul style="list-style-type: none"> <li>• Aesthetics</li> <li>• Perceived usefulness</li> <li>• Perceived ease of use</li> <li>• Perceived enjoyment</li> </ul>
Trunfio et al. (2019)	Museum in Italy	<ul style="list-style-type: none"> <li>• Heritage valorization</li> <li>• Education</li> <li>• Entertainment</li> <li>• Socialization</li> <li>• Escape</li> </ul>
Bae et al. (2020)	Cultural and artistic attraction in South Korea	<ul style="list-style-type: none"> <li>• Interactivity</li> <li>• Vividness</li> <li>• Perceived immersion</li> <li>• Perceived enjoyment</li> </ul>

Reference	Research context	Digital experience dimensions
Liu (2020)	Cultural heritage site in Taiwan	<ul style="list-style-type: none"> <li>• Interpretation and presentation</li> <li>• Usability</li> <li>• Information/knowledge</li> <li>• Entertainment</li> <li>• Engagement</li> </ul>
Guo et al. (2023)	Digital museum	<ul style="list-style-type: none"> <li>• Joviality</li> <li>• Personal escapism</li> <li>• Localness</li> </ul>

Source: Own research

As displayed in Table 1, digital experience is a multidimensional construct. According to these results, the most emphasized digital experience dimensions are entertainment and enjoyment, education, as well as escapism (escape) and immersion. In addition, in their analysis of best practices relating to the application of smart technologies in the cultural heritage context, [Buonincontri and Marasco \(2017\)](#) found that technological applications are mostly oriented to intensify and support education and entertainment, while [Han et al. \(2019\)](#) confirmed enjoyment as dominant factor that participants experienced while using augmented reality smart glasses in the cultural tourism context.

Following the digital experience features identified in the relevant literature, a measurement scale was developed. It consisted of 25 items, grouped in seven dimensions.

Namely, the dimension “expectation confirmation” was made up of 3 items (experience better than expected, service level better than expected, confirmed expectations), adapted from [Chung et al. \(2017\)](#). Dimension “perceived enjoyment/entertainment” consisted of 4 items (fun, captivating, enjoy, interesting), based on [Jung et al. \(2016\)](#), [Chung et al. \(2017\)](#), and [Liu \(2020\)](#). Dimension “engagement” comprised 4 items (spending time, immersive experience, participating experience, unique experience), as suggested by [Liu \(2020\)](#). Dimension “perceived ease of use” was made up of 3 items (clear and understandable interaction, low level of effort, ease of use), adapted from [Jung et al. \(2018\)](#). Dimension “education” consisted of 5 items (learning something new, becoming more knowledgeable, learning a lot, stimulating curiosity, good learning experience), based on [Jung et al. \(2016\)](#) and [Chung et al. \(2017\)](#). Dimension “escapism” comprised 3 items (imagining being someone else, living in a different time or place, escaping from reality), as suggested by [Jung et al. \(2016\)](#). Finally, dimension “aesthetics” was made up of 3 items (attractive, design details, pleasant), adapted from [Jung et al. \(2016\)](#) and [Jung et al. \(2018\)](#).

The digital experience features in the developed measurement scale were assessed with response options from “strongly disagree” (as 1) to “strongly agree” (as 5).

The validity of the measurement scale was established using a two-step approach. Firstly, in scale development stage, previously validated items related to the measurement construct were extracted using literature analysis (Table 1). In addition, to evaluate items in terms of sufficiency, coherence, clarity and relevance, a panel of academic and professional experts was addressed. Their review confirmed the items to be valid. Secondly, the scale validity was tested empirically. These results are reported in the next section of this paper.

The developed digital experience scale was validated by conducting a pilot study. According to [Baker \(1994\)](#), pilot studies are used to pre-test a particular research instrument. They are

conducted to increase research quality (Malmqvist et al., 2019), and to enhance research validity and reliability (Gudmundsdottir & Brock-Utne, 2010). Therefore, to meet the research goals in the present study, it is justified to conduct the pilot study.

To empirically test the developed digital experience scale, self-administered questionnaires were distributed to visitors of a medieval castle, a small heritage site located in a rural tourist destination in Croatia. The castle dates from the 13<sup>th</sup> century and is newly renovated and revitalized. Among other activities, visitors can experience the history of the castle in multimedia exhibitions using virtual and augmented reality technology. The questionnaires were distributed only to those visitors who have experienced digital technologies in the castle and showed interest in participating in the study.

Following the suggestions regarding minimum sample size, further analysis is based on data gathered from 54 participants. This sample size fulfills the rule of thumb of 30 participants as the minimum sample size for a pilot study recommended by Browne (1995) and is in accordance with a minimum acceptable sample size of 50 for performing exploratory factor analysis, as suggested by Hair et al. (2010).

A combination of statistical analysis methods was performed. Data was described with descriptive statistical analysis, calculating percentages, mean, and standard deviation. Scale validity was empirically examined using exploratory factor analysis and correlation analysis. Reliability analysis with Cronbach's alpha coefficients was performed to determine scale reliability.

### 3. PILOT STUDY RESULTS

The pilot sample consisted of 44.4 per cent male and 55.6 per cent female respondents. Their mean age was 25.8 years (SD = 7.85, ranging between 18 and 45 years). In terms of their employment status, the majority of the respondents identified themselves as students (74.1 per cent), and 25.9 per cent were employees. Accordingly, 70.4 per cent of respondents completed a secondary level of education, while 29.6 per cent reported a higher level of education. Moreover, more than half of them (51.9 per cent) indicated previous experience with digital technology usage, and the majority of respondents (88.9 per cent) reported a positive attitude toward using digital technology for heritage interpretation. Thus, the pilot sample structure suggested appropriate respondents' profiles, since young adults are deemed as the most prominent users of digital technology.

Data analysis was performed in two steps. Firstly, the validity and reliability of the tested digital experience scale were evaluated. Next, descriptive statistics for measurement items and interpretation of extracted factors (dimensions) of the tested measurement scale were conducted.

Prior to assessing the validity and reliability of the proposed measurement scale, data adequacy was checked. Kaiser-Meyer-Olkin (KMO) measure was higher than the minimum acceptable value of 0.5, as suggested by Stewart (1981), and Bartlett's Test of Sphericity was significant, as recommended by Leech et al. (2005) (see Table 2). These results imply that it is appropriate to perform exploratory factor analysis.

Table 2 summarises the results of descriptive statistics, exploratory factor analysis, and reliability analysis.



**Table 2.** Digital experience scale analyses

Factors and items	Mean (SD)	Factor loadings	Eigen values	% of Variance	Cronbach alpha
<i>Factor 1</i>	4.00 (0.720)		5.996	23.985	0.927
The experience of using digital technologies has made me more knowledgeable	3.85 (0.960)	0.859			
Using digital technologies has stimulated my curiosity to learn new things	3.70 (0.924)	0.832			
I learnt a lot by using digital technologies	3.43 (0.815)	0.795			
I learnt something new using digital technologies	4.09 (1.086)	0.780			
Digital technologies offered me the experience of participating in the history	4.30 (0.816)	0.756			
The setting reality of digital technologies showed attention to design details	4.20 (0.919)	0.726			
Digital technologies provided a good learning experience.	3.85 (0.878)	0.712			
The way the history was presented through digital technologies was interesting	4.59 (0.599)	0.680			
<i>Factor 2</i>	4.36 (0.676)		4.392	17.567	0.917
I was willing to spend time exploring different areas with digital technologies	4.59 (0.599)	0.856			
The interaction with digital technologies is clear and understandable	4.67 (0.752)	0.842			
The interaction with digital technologies does not require a lot of effort	4.65 (0.955)	0.775			
Digital technologies offered me a personalized, unique experience	4.22 (0.861)	0.730			
My experience of using digital technologies was better than what I expected	3.98 (0.789)	0.699			
Digital technologies offered me an immersive experience	4.04 (0.823)	0.619			
<i>Factor 3</i>	3.35 (0.897)		3.404	13.616	0.896
I felt like I was living in a different time or place when using digital technologies	3.19 (0.992)	0.923			
Digital technology experience let me imagine being someone else	3.44 (0.984)	0.912			
I completely escaped from reality when using digital technologies	3.41 (0.981)	0.767			
Using digital technologies was very pleasant*	4.48 (0.795)	0.477			
<i>Factor 4</i>	4.37 (0.495)		3.153	12.613	0,784
Using digital technologies was captivating	3.83 (0.637)	0.823			

Factors and items	Mean (SD)	Factor loadings	Eigen values	% of Variance	Cronbach alpha
I enjoyed using digital technologies	4.50 (0.607)	0.793			
Using digital technologies was fun	4.70 (0.571)	0.758			
Overall, most of my expectations from using digital technologies were confirmed*	3.80 (1.035)	0.590			
Using digital technologies was very attractive	4.43 (0.716)	0.565			
<i>Factor 5</i>			-	-	-
The service level provided by digital technologies was better than what I expected*	3.98 (0.789)	0.845			
<i>Factor 6</i>			-	-	-
I find digital technologies easy to use*	4.81 (0.392)	0.700			
<i>Total</i>				67.780	0.923
Kaiser-Meyer-Olkin (KMO)	0.647				
Bartlett's Test of Sphericity	1601.830 (p < 0.01)				

**Note:** mean scores range from 1 to 5; values in parentheses are standard deviations;  
\* removed from further analysis

**Source:** Own research

In addition to content validity addressed in the methodology section, the validity of the proposed digital experience measurement scale was assessed using exploratory factor analysis, as well.

The data analysis (see Table 2) showed that of 25 items, one item (“Using digital technologies was very pleasant”) had factor loading value lower than 0.5, one item (“Overall, most of my expectations from using digital technologies were confirmed”) was strongly loaded on several factors, and two items (“The service level provided by digital technologies was better than what I expected” and “I find digital technologies easy to use”) were loaded as factors with single-item solution. To meet the criteria for an acceptable factor solution, as proposed by [Hair et al. \(2010\)](#), these four items were excluded from further analysis. Accordingly, further analysis is based on a four-factor solution with 21 items.

Therefore, as shown in Table 2, exploratory factor analysis, using principal component analysis with varimax rotation resulted in the final factor solution explaining 67.78 per cent of the total variance in the data. Factor loadings ranged from 0.565 to 0.923, and eigenvalues were between 3.153 and 5.996. According to the cut-off criteria recommended by [Taherdoost \(2016\)](#), these results confirm the validity of the tested measurement scale, since all items had factor loadings above 0.4, and eigenvalues for all factors were greater than 1. In addition, as displayed in the correlation matrix in Table 3, correlation coefficients did not exceed the value of 0.70, meaning that extracted factors are not highly correlated and are distinct from each other, confirming adequate scale validity, as well.

**Table 3.** Correlation matrix for extracted factors

Factor	Factor 1	Factor 2	Factor 3	Factor 4
Factor 1	1.000			
Factor 2	0.635**	1.000		
Factor 3	0.351**	0.376**	1.000	
Factor 4	0.183	0.247	0.316*	1.000

**Note:** \*\* correlation significant at 0.01 level; \* correlation significant at 0.05 level

**Source:** Own research

Next, the reliability of the measurement scale was examined using Cronbach's alpha coefficients (see Table 2). The values for each factor varied from 0.784 to 0.927, and for the overall scale, the coefficient was 0.923, exceeding the value of 0.70, as proposed by Hair et al. (2010). These results suggest good internal consistency and high reliability of the measurement scale.

Thus, the results of the validity and reliability assessment imply that the tested digital experience scale met the validity criteria, and confirmed the reliability of the scale.

Furthermore, as shown in Table 2 and explained above, the final factor solution resulted in four factors (dimensions). The first factor was made up of eight items, explained the largest percentage of variances among the four factors, and was named "learning experience". The second factor consisted of six items, had a second-highest overall mean score, and was labelled as "interaction". The third factor called "escapism" included three items, and had the lowest overall mean score among the extracted factors. The fourth factor, "enjoyment/entertainment" was made up of four items, and had the highest overall mean score among the four factors.

#### 4. CONCLUSION

By developing a digital experience scale and testing it with quantitative data, this study provided a set of features that affect visitor experience when using digital technologies in a small rural heritage setting.

As a result of conducted pilot testing, the developed measurement scale was improved. Research results confirmed the validity and reliability of the proposed digital experience scale, which in the final stage, after item purification, consisted of 21 items. In addition, four distinct factors were identified to measure digital experience in small rural heritage settings: learning experience, interaction, escapism, and enjoyment/entertainment. They align with the theoretical foundation in the development stage of the tested measurement scale.

Additionally, these results indicated a four-dimensional digital experience in a rural heritage context. The first dimension "learning experience" includes items related to knowledge, curiosity, learning, and the way of presenting history. The second dimension "interaction" consists of items related to ease of use, engagement, and personalization, and reflects visitors' way of interaction with technology used and presented historical contents. The third dimension "escapism" describes visitors' experiences that differ from their everyday lives, and take them to different times and places. Finally, the fourth dimension "enjoyment/entertainment" regards items reflecting captivating, enjoyable, funny, and attractive aspects of digital experience.

Even though all methodological recommendations were met for conducting a pilot study, and reported results were valid and supported by the theory, several research limitations should be addressed in future research. Future studies should further test the measurement scale and try to improve the final factor solution proposed in the present study, using a larger sample that would allow testing of other psychometric properties of the scale. A larger sample would also allow easier generalization of the findings. In addition, future research is suggested to explore how features included in the developed digital experience scale influence visitors' satisfaction and behavioral intention.

Although further research is needed to additionally validate the proposed measurement scale and four-dimensional digital experience structure, this study extends the experience measurement literature and adds to the knowledge of digital technologies implementation in small rural heritage sites. It also contributes to the conceptualization of digital experience, by reflecting the rural heritage site digital experience as an educational, interactive, enjoyable and entertaining escape from reality. Thus, the present study provides useful guidelines to better understand the key digital technology experience factors and implications in small heritage sites located in rural destinations.

### Acknowledgment

This paper is the result of the scientific project “Tourism Experience Measurement in Physical and Virtual Space”, which is supported by the University of Rijeka (project ZIP- UNIRI-116-1-21).

### References

- Bae, S., Jung, T. H., Moorhouse, N., Suh, M., & Kwon, O. (2020). The Influence of Mixed Reality on Satisfaction and Brand Loyalty in Cultural Heritage Attractions: A Brand Equity Perspective. *Sustainability*, 12, 2956. doi:10.3390/su12072956
- Baker, T. L. (1994). *Doing social research*. 2<sup>nd</sup> edition, New York, NY: McGraw-Hill.
- Bec, A., Moyle, B., Timms, K., Schaffer, V., Skavronskaya, L., & Little, C. (2019). Management of immersive heritage tourism experiences: A conceptual model. *Tourism Management*, 72, 117-120. <https://doi.org/10.1016/j.tourman.2018.10.033>
- Browne, R. H. (1995). On the use of a pilot sample for sample size determination. *Statistics in Medicine* 14, 1933– 1940.
- Buonincontri, P., & Marasco, A. (2017). Enhancing Cultural Heritage Experiences with Smart Technologies: An Integrated Experiential Framework. *European Journal of Tourism Research* 17, 83-101.
- Chung, N., Lee, H., Kim, J.-Y., & Koo, C. (2017). The Role of Augmented reality for Experience-Influenced Environments: The Case of Cultural Heritage Tourism in Korea. *Journal of Travel Research*, 1-17, <https://doi.org/10.1177/0047287517708255>
- Gudmundsdottir, G. B., & Brock-Utne, B. (2010). An exploration of the importance of piloting and access as action research. *Educational Action Research*, 18, 359–372. doi:10.1080/09650792.2010.499815
- Guo, K., Fan, A., Lehto, X., & Day, J. (2023). Immersive Digital Tourism: The Role of Multisensory Cues in Digital Museum Experiences. *Journal of Hospitality & Tourism Research*, 47(6), 1017-1039. <https://doi.org/10.1177/10963480211030319>
- Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2010). *Multivariate Data Analysis: A Global Perspective*. 7th Edition, New Jersey: Pearson Education Inc., Upper Saddle River.
- Han, D-I., tom Dieck, M. C., & Jung, T. (2017). User experience model for augmented reality applications in urban heritage tourism. *Journal of Heritage Tourism*, DOI: 10.1080/1743873X.2016.1251931
- Han, D-I., tom Dieck, M. C., & Jung, T. (2019). Augmented Reality Smart Glasses (ARSG) visitor adoption in cultural tourism. *Leisure Studies*, <https://doi.org/10.1080/02614367.2019.1604790>
- Jung, T., tom Dieck, M. C., Lee, H., & Chung, N. (2016). Effects of Virtual Reality and Augmented Reality on Visitor Experiences in Museum. In: Inversini, A., Schegg, R. (Eds.), *Information and Communication Technologies in Tourism*. Springer, Cham. [https://doi.org/10.1007/978-3-319-28231-2\\_45](https://doi.org/10.1007/978-3-319-28231-2_45)

- Jung, T. H., Lee, H., Chung, N., & tom Dieck, M. C. (2018). Cross cultural differences in adopting mobile augmented reality at cultural heritage tourism sites. *International Journal of Contemporary Hospitality Management*, 30(3), 1621-1645. DOI 10.1108/IJCHM-02-2017-0084
- Leech, N. L., Barrett, K. C., & Morgan, G. A. (2005). *SPSS for Intermediate Statistics: Use and Interpretation*. 2nd Edition, New Jersey: Lawrence Erlbaum Associates Publishers.
- Liu, Y. (2020). Evaluating visitor experience of digital interpretation and presentation technologies at cultural heritage sites: a case study of the old town Zuoying. *Built Heritage*, 4(14), 1-15. <https://doi.org/10.1186/s43238-020-00016-4>
- Malmqvist, J., Hellberg, K., Möllås, G., Rose, R., & Shevlin, M. (2019). Conducting the Pilot Study: A Neglected Part of the Research Process? Methodological Findings Supporting the Importance of Piloting in Qualitative Research Studies. *International Journal of Qualitative Methods*, 18. <https://doi.org/10.1177/1609406919878341>
- Stewart, D. W. (1981). The Application and Misapplication of Factor Analysis in Marketing Research. *Journal of Marketing Research*, 18(1), 51-62.
- Taherdoost, H. (2016). Validity and Reliability of the Research Instrument: How to test the Validation of a Questionnaire/Survey in a Research. *International Journal of Academic Research and Management*, 5(3), 28-36.
- tom Dieck, M. C., & Jung, T. (2018). A theoretical model of mobile augmented reality acceptance in urban heritage tourism. *Current Issues in Tourism*, 21(2), 154–174.
- Trunfio, M., Campana, S., & Magnelli, A. (2019). Measuring the impact of functional and experiential mixed reality elements on a museum visit, *Current Issues in Tourism*, <https://doi.org/10.1080/13683500.2019.1703914>
- Weber Sabil, J., & Han, D-I. (2021). Immersive tourism: State of the Art of Immersive Tourism Realities through XR Technology. Available online: [https://pure.buas.nl/ws/portalfiles/portal/10867716/Weber\\_Han\\_Immersive\\_Tourism\\_State\\_of\\_the\\_Art.pdf](https://pure.buas.nl/ws/portalfiles/portal/10867716/Weber_Han_Immersive_Tourism_State_of_the_Art.pdf)





# Sustainable Development of Spa Tourism through the Mobilization of Local Resources

Boban Đurović<sup>1</sup> 

Received: June 21, 2023

Accepted: November 3, 2023

Published: March 16, 2024

## Keywords:

Spa tourism;  
Sustainable development;  
Spa destinations;  
Sustainable tourism



Creative Commons Non Commercial CC BY-NC: This article is distributed under the terms of the Creative Commons Attribution-Non-Commercial 4.0 License (<https://creativecommons.org/licenses/by-nc/4.0/>) which permits non-commercial use, reproduction and distribution of the work without further permission.

**Abstract:** *The heterogeneous needs and demands of tourists have led to the development of different types of tourism. Due to the desire to spend a part of their time outside of the usual daily activities, tourists today are increasingly developing needs that are in line with the principles of sustainable development. The Republic of Serbia is often referred to as the land of spas, due to numerous thermal mineral springs, which have been used as tourist destinations for decades. In order to preserve the value of spas, and then improve the spa's position as a sustainable tourist destination, strategic decisions are needed that will ensure the use of the resources available to the spa, while respecting the principles of sustainable development. Bearing in mind the above, this paper aims to examine the possibilities of spa tourism development through the mobilization, ie engagement of local resources.*

## 1. INTRODUCTION

Tourism worldwide experienced significant growth following the Second World War. This rapid development brought about numerous positive effects on employment and the gross domestic product. However, it also led to noticeable negative consequences, which are particularly prominent in today's context. The surge in tourist demand necessitated the establishment of new tourism infrastructure, resulting in detrimental environmental impacts. Additionally, tourism involves the intensive utilization of both natural and anthropogenic resources in a destination, leading to a decline not only in the overall availability of resources but also in their quality (Bošković, 2008). To counteract this trend, strategic transformations within the tourism industry are imperative. These changes must encompass the integration and implementation of sustainable development principles in tourist destinations. The notion of sustainable development in tourism aims to prevent further resource degradation and depletion. It involves educating all stakeholders within the tourism sector about the significance of environmental protection, fostering environmental responsibility, achieving a balance between economic, ecological, and social objectives, and advocating for ethical responsibility towards the natural and anthropogenic resources of the destination (Cvetanović & Stamatović, 2013). One particular manifestation of sustainable tourism that holds considerable relevance for the Republic of Serbia is spa tourism.

As the Republic of Serbia is often referred to as a country of spas, the development of this type of sustainable tourism can not only ensure the use of comparative advantages in the field of tourism but also enable the basis of overall social and economic progress (Petrović & Đoković, 2017). In order to achieve this, strategic decisions are necessary, which are based on the sustainable use of local resources available to spa destinations. Bearing in mind the above, this paper aims to examine the possibilities of spa tourism development through the mobilization, ie engagement of local resources.

<sup>1</sup> Municipality of Vrnjačka Banja, Kruševačka 17, 36210, Vrnjačka Banja, Republic of Serbia

The analysis in the paper is based on the case study of Vrnjačka Spa, the most popular and sought-after spa destination in the Republic of Serbia. The specific natural and anthropogenic resources of this spa enable their engagement to develop specific and different types of sustainable tourism. Since other spa destinations have similar resources to a greater or lesser extent, the results of the analysis can be useful for defining the strategy of engaging local resources and developing sustainable spa tourism in the Republic of Serbia.

## 2. SUSTAINABLE TOURISM

Tourism represents one of the fastest-growing activities in the world, which provides a large number of jobs and a significant contribution to the overall economic result. But in addition to the positives, the intensive development of tourism activities also provides certain negative effects, which are especially pronounced when it comes to the effects on the environment (Yazdi, 2012). Increased tourism needs require the construction of new capacities, air, water and soil pollution, consumption of non-renewable resources, but also the degradation of anthropogenic resources that have been created throughout history (Bošković, 2008). In order to prevent the further negative impact of tourism on the environment, it is necessary to develop and implement the principles of sustainable development. Sustainable tourism emerges as a noteworthy new facet of the tourist industry, given the contemporary lifestyle of individuals who seek to substitute noise, stress, and unhealthy habits with healthier principles. It represents a new approach to travel and leisure, aligning with the evolving preferences of people in today's world.

Sustainable tourism encompasses the concept of conducting tourism activities and businesses in a manner that avoids any detrimental effects on both the environment and the socio-cultural aspects of the local community where the tourism takes place (Pavlović et al., 2009). The World Tourism Organization emphasizes that sustainable tourism enables the fulfillment of tourist needs while ensuring minimal negative impact on the environment. Moreover, it asserts that tourism activities should be executed in a way that allows future generations to meet their own specific tourism requirements (Stefanović & Azemović, 2012). The implementation of sustainable development principles becomes crucial in achieving this objective. Thus, sustainable tourism revolves around three pivotal elements (Yazdi, 2012):

1. Quality - the tourist offer must still be at a high level of quality in order to create tourist satisfaction. In parallel with that, it is necessary to ensure the continuous quality of life of the local community within which tourism is realized, which is possible only with the preservation of natural and anthropogenic resources.
2. Continuity - the natural and anthropogenic resources of the tourist destination must be permanently preserved so that they can be used for the needs of tourism and the coming generations in the future.
3. Balance - sustainable tourism necessarily requires a balancing of economic, ecological and social goals.

While the primary objective of sustainable tourism remains the generation of profits for service providers, it is acknowledged that these profits should also be distributed within the local community. Furthermore, sustainable tourism entails promoting an understanding of the local flora and fauna, as well as the historical and cultural attributes of the destination (Pavlović et al., 2009). Consequently, sustainable tourism goes beyond mere leisure and recreation; it assumes an educational dimension as well. In addition to the aforementioned aspects, the following goals



of sustainable tourism can be identified (Niedziolka, 2012; Cvetanović & Stamatović, 2013; Stefanović & Azemović, 2012):

- respect for the interests of the local community when creating the tourist offer,
- development of the mission, vision and strategy for the preservation of resources used within the offer,
- destination branding in accordance with the principles of sustainable development,
- preserving the social, cultural and historical integrity of the community,
- environmental protection,
- satisfying the needs of tourists,
- making a profit.

The realization of the principles of sustainable tourism is possible only with the definition of strategic plans, in which tourist organizations, public institutions and the local community will be engaged. The goal is to ensure optimal engagement of available natural and anthropogenic resources, in a way that will not lead to their degradation (Bošković, 2008). Strategic decisions for the development of sustainable tourism especially require the suspension of unplanned infrastructural construction and the expansion of physical capacities to the detriment of the natural environment. In parallel with that, the revitalization of natural attractions and their sustainable management in accordance with the principles of sustainable development is needed (Cvetanović & Stamatović, 2013). Therefore, sustainable tourism requires a systematic approach to the preservation of biodiversity, cultural and historical creations, optimal use of natural resources, respect for ethnicity, traditions and customs of the local community, in such a way as to ensure the satisfaction of tourists, create a certain degree of profit, but also preserve all the aforementioned resources for the needs future generations (Niedziolka, 2012; Cvetanović & Stamatović, 2013).

### 3. SPA TOURISM

Spa tourism represents a distinctive form of sustainable tourism that capitalizes on the inherent elements of spas, including thermal mineral springs, healing mud, clean air, abundant vegetation, and unique climatic conditions (Topalović, 2015). Given the specific nature of these natural resources, spa destinations are well-suited for the development of medical tourism, which can be regarded as a specialized form of sustainable tourism (Ljubisavljević & Leković, 2020). However, in addition to medical tourism, spas are also conducive to the growth of other tourism types such as ecological, educational, sports-recreational, wellness tourism, and more.

Spa tourism, as a specific form of tourism, primarily involves the use of thermal and mineral springs for treatment, rest and rehabilitation of visitors. However, the specific nature and quality of natural resources and climatic features also attract tourists who are eager for rest and recreation in a healthy environment. In addition, business events, congresses and various manifestations are often organized in spas, which is a possibility for the development of some other additional types of sustainable tourism in spa destinations (Petrović, 2017). These are some of the reasons why in a large number of spas there is an even distribution of tourist visits and overnight stays throughout the year (regardless of the season), as well as an average longer stay of guests than in other destinations (Topalović, 2015). In order for sustainable tourism to develop, spas should realize fundamental functions concerning the mandatory protection and rational use of thermo-mineral sources and the planned improvement and development of infrastructure and physical capacities (Petrović & Đoković, 2017). In fact, special emphasis must be placed on the preservation of thermal mineral springs, since it is the most important natural

resource of every spa, which plays a central role not only in providing tourist services but also in providing healing functions (Mojčić & Šušić, 2018). The development of spa tourism is largely based on the healing effects of thermomineral springs, through the promotion of the effects of thermomineral springs on cardiovascular health, skin care, reducing stress levels and physical pain. More precisely, all elements of demand in spa tourism can be viewed from the aspect of the influence of balneological properties on mental, physical and spiritual health (Ljubisavljević & Leković, 2020).

In addition to the above, spa destinations are often characterized by the presence of pronounced cultural characteristics of the local community, as well as the existence of specific cultural and historical creations. Therefore, the development of spa tourism must also be based on ensuring a balance between economic, ecological and social goals (Hrabovski Tomić & Milićević, 2012). Continuous research into the qualitative properties of thermomineral waters is required, to ensure that the development of tourism does not have a degrading effect on this natural resource. In addition, it implies the creation of long-term strategic plans in order to ensure the optimal use of the available resources of the spa destination, first to preserve the flora and fauna, and then to preserve the resources for the needs of future generations (Mojčić & Šušić, 2018).

#### **4. SUSTAINABLE SPA TOURISM DEVELOPMENT THROUGH THE MOBILIZATION OF LOCAL RESOURCES: CASE STUDY OF VRNJAČKA BANJA**

As frequently stated, the Republic of Serbia is renowned as the "land of spas" boasting over 300 distinct thermal mineral springs (Topalović, 2015). Spa tourism holds a pivotal role in the overall development of tourism in the country, with Vrnjačka Spa emerging as a highly competitive destination (Petrović & Đoković, 2017). According to data from the Statistical Office of the Republic of Serbia, a total of 12,245,613 overnight stays were recorded in 2022. Among these, 3,054,744 overnight stays were attributed to spa destinations, accounting for 24.94% of all stays. Vrnjačka Spa, in particular, achieved 756,142 overnight stays, representing 24.75% of the total, securing its second-place position after Sokobanja. However, unlike Sokobanja, where foreign tourists accounted for 2.83% of overnight stays, Vrnjačka Spa experienced a higher percentage of 10.59%, indicating its international recognition as a spa destination (Republički zavod za statistiku, 2022). This recognition stems primarily from Vrnjačka Spa status as the most renowned spa resort in the Republic of Serbia (Hrabovski Tomić & Milićević, 2012). Additionally, the development of various forms of sustainable tourism, including events, sports-recreational activities, ecological tourism, and rural tourism, further contributes to its appeal (Pavlović et al., 2009).

Vrnjačka Banja is located at an altitude of 210-300 meters above sea level, in the valley of Zapadna Morava, on the slopes of Mount Goč and is part of the large forest complex of Mount Kopaonik. The specific climate is also determined by the presence of the surrounding mountains Jastrebac, Stolovi and Željin (Hrabovski Tomić & Milićević, 2012; Savić & Manić, 2023). If we look at its spa location, Vrnjačka Spa belongs to the thermomineral zone of Western Morava and second group of spas (out of a total of three) within which both the summer and winter seasons are expressed (Topalović, 2015).

The sustainable development of spa tourism in Vrnjačka Spa requires responsible and sustainable use of numerous natural and anthropogenic resources. Zrnić et al. (2021) highlight the strategic nature of planning the use of local resources, which implies balancing the needs and

demands of tourists with the sustainable character of natural and anthropogenic resources. The above requires a clear definition of long-term strategic goals, mission and vision of tourism development. The strategic nature of such a plan implies that, in addition to the involvement of tourist organizations, the development of sustainable spa tourism also includes public organizations, which will provide adequate marketing, financial and logistical support.

Examining the wealth of natural resources, it is worth highlighting their potential principles and future applications. Vrnjačka Spa boasts a plethora of hydrological resources, including a diverse river network, Selište lake, etc. Notably, there are seven mineral springs, four of which are employed for balneological therapy. Among these, the oldest source, known as Topla voda, stands as a unique marvel worldwide, maintaining a temperature of 36.5 degrees Celsius. Consequently, safeguarding this source from any form of pollution or unregulated use is of utmost importance (Hrabovski Tomić & Milićević, 2012). These thermal mineral springs, along with others, hold immense potential for therapeutic applications and the development of medical and wellness tourism as a sustainable form of tourism. Furthermore, considering the additional hydrographic resources such as Zapadna Morava, Vrnjačka river, Selište lake, and others, opportunities arise for fishing tourism, as well as ecological and educational tourism, offering visitors the chance to explore the diverse flora and fauna within these ecosystems.

Among the array of natural resources, the numerous and distinctive parks in Vrnjačka Spa deserve special recognition. These parks encompass a total area of 27 hectares and host an impressive variety of 165 woody species, including trees that have thrived for over a century. Serving as exceptional avenues, these parks provide well-designed pathways within a pristine environment (Hrabovski Tomić & Milićević, 2012). They contribute not only to the development of medical tourism but also offer opportunities for recreational, excursion, and ecological tourism. Notably, the Japanese Garden, spanning 3,000 square meters, serves as a captivating representation of Japanese culture, architecture, and horticulture, adding an anthropogenic dimension to the natural surroundings (Opština Vrnjačka Banja, 2013). The parks encompass a diverse range of plant species, including deciduous and coniferous trees, as well as exotic varieties like Canadian spruce, Ayan spruce, Japanese cherry, and more. Furthermore, the parks feature expansive flower roundels, spanning over 1,630 square meters, adorned with a plethora of floral species and embellishments. Situated in the central part of the park, the natural monument Crni bor is an ancient black pine tree, over 200 years old, standing tall at a height of 35 meters (Vrnjačka Banja, 2023).

Ecological and educational tourism of Vrnjačka Spa can be developed due to the existence of numerous forest resources. Namely, Vrnjačka Spa represents one of the most forested territories of the Republic of Serbia, since forests cover more than 65% of the total territory. Within these forests there are numerous springs and watercourses, medicinal and aromatic plants (it is estimated that there are more than 650 species), as well as specific flora and fauna. Such an ecosystem enables another direction of potential development of sustainable tourism, which is hunting tourism. Namely, the sustainable development of spa tourism in Vrnjačka Spa can move towards the implementation of specially planned and controlled hunting tourism, due to numerous animal species. This is made possible by the two hunting grounds that exist on the territory of Vrnjačka Spa, namely Vrnjačka Reka and Beli Izvor (Opština Vrnjačka Banja, 2013).

In addition to natural ones, Vrnjačka Spa also has specific anthropogenic resources, which can also be used for the development of sustainable tourism. In this regard, the oldest resources among them should be highlighted, which are archaeological sites dating from the period of

the Roman Empire, such as the Roman spring Fons Romanus. In the 19<sup>th</sup> century, the first spa resorts were developed, and in that period the development of tourism in Vrnjačka Banja began. In order to provide accommodation, first of all for rich aristocratic families, specific architectural buildings were created that today have specific cultural and historical significance (Hrabovski Tomić & Milićević, 2012). The Belmark's Castle, built in the 19<sup>th</sup> century based on the model of Polish castles built in the north of Italy, appears as the best representative example of this spa architecture. We should also highlight the traditional Serbian houses on Čajka Hill (49 buildings in total), which represent part of the cultural and historical complex of Vrnjačka Spa (Kovačević, 2001). Vrnjačka Spa boasts remarkable anthropogenic resources that contribute to its cultural and historical appeal. Noteworthy among these resources are the public library, which holds a legacy of over a century, and the Museum of spa treatment housed within the Museum of Science and Technology. Additionally, the memorial room dedicated to Danilo Bata Stojković, one of the most renowned Serbian actors, adds to the cultural richness of the destination. Furthermore, the Church of the Nativity of the Blessed Virgin Mary holds significant potential in fostering the development of religious tourism, offering visitors an important spiritual and cultural experience (Vrnjačka Banja, 2023).

Vrnjačka Spa is also known for numerous events. As an anthropogenic creation, manifestations can be used for the development of sustainable tourism, where the Vrnjački Carnival should first be highlighted, the content of which consists of numerous theater performances, concerts, sports events, exhibitions, as well as other activities through which local culture and tradition are presented (Đorđević et al., 2021). Apart from events that have national significance, Vrnjačka Spa also organizes numerous other events of different characters, which also attract foreign tourists. Among these events, we should highlight "Lovefest" (which promotes contemporary music and youth art), an event in honor of the poet Desanka Maksimović, "Mathematical Bridge" - an event that popularizes mathematics, as well as events that popularize traditional crafts, flowers, sports activities, acting and so on (Vrnjačka Banja, 2023). Given the above, there is a possibility of development and event tourism in Vrnjačka Spa.

## 5. FUTURE RESEARCH DIRECTIONS

Considering the escalating environmental impact of tourism, it is evident that research and development of sustainable tourism will gain increasing significance in the foreseeable future. Within the Republic of Serbia, this form of tourism can be fostered through the advancement of spa tourism, given the abundance of spas in the country, many of which are well-developed and attract a substantial number of tourists. To safeguard both natural and anthropogenic resources, it is imperative to implement sustainable development principles within spa environments, ensuring a harmonious balance of economic, ecological, and social objectives. The findings presented in this paper are based on the case study of Vrnjačka Spa, one of the most renowned spa destinations in the Republic of Serbia. While the results of this analysis can be extrapolated to guide the strategy of sustainable spa tourism development in other destinations, future research should encompass a wider range of spa destinations, particularly those that are most frequented within the Republic of Serbia. This inclusion is necessary to identify significant natural and anthropogenic resources that attract tourists and to preserve these resources from potential degradation. Additionally, future research should delve into analyzing the possibilities of developing specific forms of tourism within spas, examining the roles and importance of individual tourist organizations and public institutions. Furthermore, capturing the opinions and attitudes of tourists and the public will provide valuable insights for comprehensive studies in the field.

## 6. CONCLUSION

The findings derived from the case study hold significant importance in assessing the potential for utilizing local resources in spa destinations and developing specific forms of sustainable tourism. As the Republic of Serbia is renowned for its abundance of spas, there exists a wealth of natural and anthropogenic resources that can be leveraged to enhance tourism development. However, considering the value and rarity of these resources, along with their unique cultural and historical factors, their mobilization must align with strategic principles. The aim is to achieve a balance between economic, ecological, and social objectives, ensuring the preservation of these resources for future generations.

The distinctive climatic attributes of spa destinations, coupled with a pristine and healthful environment, make them particularly well-suited for the advancement of medical tourism. Indeed, spas in the Republic of Serbia predominantly cater to the development of medical and wellness tourism. Yet, it is important to recognize that these climatic features, along with the distinctive flora and fauna, offer opportunities for the development of other forms of sustainable tourism within spas, such as ecotourism, educational tourism, hunting and fishing tourism, as well as excursion tourism. When considering anthropogenic resources, a plethora of cultural and historical monuments, archaeological sites, architectural wonders, religious edifices, and sports facilities are present within spas. These resources provide avenues for the development of cultural-historical tourism, sports-recreational tourism, and religious tourism as forms of sustainable tourism. Furthermore, it is essential to acknowledge the significance of the local culture, traditions, customs, and the multitude of events taking place in spas, presenting opportunities for the development of event tourism.

## References

- Bošković, T. (2008). Održivi turizam kao savremeni koncept razvoja turizma. *Škola biznisa*, 4(16), 123-127.
- Cvetanović, D. S., & Stamatović, Lj. M. (2013). Karakteristike novih usluga u turizmu. *Ekonomika*, 4, 202-216.
- Đorđević, N., Podovac, M., & Milićević, S. (2021). Istraživanje zadovoljstva lokalne zajednice manifestacijom međunarodni Vrnjački karneval. *Oditor*, 7(1), 101-130. <https://doi.org/10.5937/Oditor2101101D>
- Hrabovski Tomić, E., & Milićević, S. (2012). Razvoj turizma Vrnjačke Banje na principima održivog razvoja. *Teme*, 36(2), 755-771.
- Kovačević, T. (2001). Antropogeni potencijali Vrnjačke Banje. *Turizam*, 5, 109-111.
- Ljubisavljević, T., & Leković, M. (2020). Contemporary spa tourism development trends with reference to the Republic of Serbia. In: D. Cvijanović (Ed.), *Tourism in function of development of the Republic of Serbia - Tourism and Rural Development* (TISC 2020), Faculty of Hotel Management and Tourism in Vrnjačka Banja, University of Kragujevac, Vrnjačka Banja, 215-230.
- Mojić, J., & Šušić, V. (2018). Thermomineral sources in the function of healthcare tourism in southern Serbia. In: J. Đurović Todorović (Ed.), *49th International Scientific Conference quantitative and qualitative analysis in economics*, University of Niš, Faculty of Economics, Niš, 89-100.
- Niedziolka, I. (2012). Sustainable tourism development. *Regional Formation and Development Studies*, 8(3), 157-166. <https://doi.org/10.15181/rfds.v7i2.2371>

- Opština Vrnjačka Banja. (2013). *Strategija održivog razvoja opštine Vrnjačka Banja 2013-2023*. Vrnjačka Banja: Opština Vrnjačka Banja.
- Pavlović, M., Radivojević, N., & Lazić, J. (2009). Održivi razvoj banjskog turizma u Srbiji. *Industrija*, 37(2), 37-57.
- Petrović, D. (2017). Banje Republike Srpske kao održive turističke destinacije. *Turističko poslovanje*, 20, 37-50. <https://doi.org/10.5937/TurPos1720037P>
- Petrović, J., & Đoković, F. (2017). Economic aspects of sustainable tourism development of Vrnjci spa. *Ekonomika*, 1(1), 83-91.
- Republički zavod za statistiku. (2022). *Saopštenje. Statistika ugostiteljstva i turizma - turistički promet decembar 2022. godine*. Beograd: Republički zavod za statistiku.
- Savić, A., & Manić, V. (2023). Dalji razvoj medicinskog turizma u Vrnjačkoj Banji uvođenjem Schroth metode. *Zdravstvena zaštita*, 52(1), 94-105. <https://doi.org/10.5937/zdravzast52-43692>
- Stefanović, V., & Azemović, N. (2012). Održivi razvoj turizma na primeru Vlasinske površi. *Škola biznisa*, 1, 38-50. <https://doi.org/10.5937/skolbiz1201038S>
- Topalović, S. (2015). Stanje i perspektive banjskog turizma u Srbiji. *GLOBUS – Časopis za Metodološka i didaktička pitanja geografije*, 37(38), 123-134.
- Vrnjačka Banja. (2023). <https://vrnjackabanja.co.rs/>, Retrieved June 2023.
- Yazdi, S. K. (2012). Sustainable tourism. *American International Journal of Social Science*, 1(1), 50-56.
- Zrnić, M., Đoković, F., Košutić, J., Mašić, C., & Hassan, V. (2021). Planning and development of spa & wellness tourism. In: G. Knežević (Ed.), *SITCON 2021 Spa&Wellness Tourism – Development, Perspectives, and Experiences*, University Singidunum, Belgrade, 60-68.



# Possibility of Application of the Triple Helix Model with the Aim of Sustainable Development of Republic of Srpska's Spa

Vesna Novakovic<sup>1</sup>   
Sanel Jakupovic<sup>2</sup> 

Received: June 17, 2023.

Accepted: October 30, 2023

Published: March 16, 2024

## Keywords:

Management;  
The Triple helix model;  
Digitalization;  
Open innovation



Creative Commons Non Commercial CC BY-NC: This article is distributed under the terms of the Creative Commons Attribution-Non-Commercial 4.0 License (<https://creativecommons.org/licenses/by-nc/4.0/>) which permits non-commercial use, reproduction and distribution of the work without further permission.

**Abstract:** *This study aims to show how we can apply the Triple helix model to improve the development and management of the spa recreational potential of the Republic of Srpska. The lack of a unique platform that would represent the spa-recreational potential of the Republic of Srpska as a destination that is rich in visual content and is based on a segmentation model, was an incentive for this paper. The research concept is based on the Triple Helix model by bringing together higher education institutions, tourism small and medium enterprises, and government representatives. Also, the research aims to collect and analyze data on the possibilities of improving the business of spas through greater promotion of their activities.*

## 1. INTRODUCTION

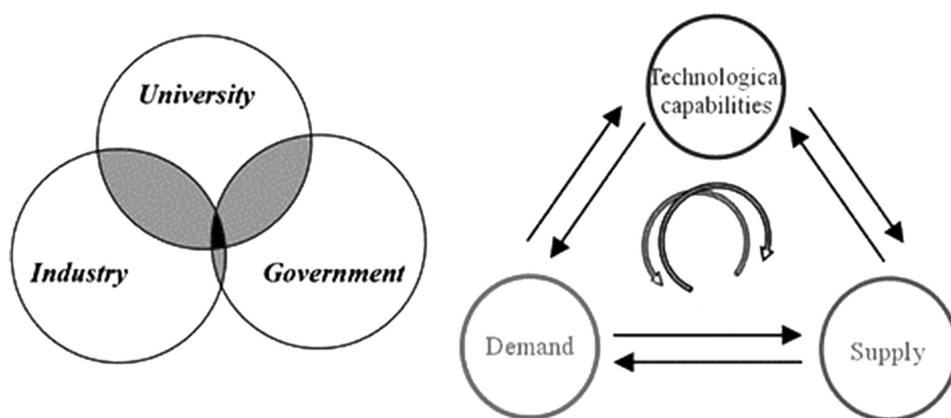
In previous decades, tourism has stood out as one of the fastest-growing industries globally. The consumption by tourists contributes to an increase in employment, an increase in production, and represents a significant increase in the income of the entire national economy (Pavlic et al., 2014). What is important for this research paper is the aspect of using water as the main resource for numerous activities in tourism. Along with the medical importance and influence of medicinal water on people's health, at the beginning of the 20<sup>th</sup> century, there was an acceptance of access to spa tourism in terms of leisure and vacation. Modern spas still use the same healing waters for similar purposes as they did millennia ago, which proves their importance in many cultures. Traditional resorts or medical spas are mainly located in "Germany, France, Baltic States, Central and Eastern European countries and Russia" (Kurek et al., 2020). Water is a symbol of health tourism through its two main components: spa tourism and wellness tourism (Nistoreanu & Aluculesei, 2021). Therefore, geothermal waters are optimal for tourist and recreational purposes, and correspond to the concept of sanum per aquam (spa) (Kurek et al., 2020). The works by Lund and Boyd (2016) estimate that 25% of geothermal water worldwide is used in spas and health facilities for its balneotherapeutic potential. These figures show the global character of the geothermal spa industry, and that geothermal spa tourism is expanding its niche. Thus, in the Republic of Srpska, through strategic documents, the importance of the development of the tourism potential of the Republic of Srpska, as well as the importance of spa tourism, was recognized. The Tourism Development Strategy of the Republic of Srpska for the period 2021–2027 defines one measure to achieve the fifth priority as the need to "create a comprehensive and high-quality bilingual (English and Serbian) website of the destination that is rich in visual content and is based on a

<sup>1</sup> Pan-European University "APEIRON" Banja Luka, Faculty of Business Economics, Vojvode Pere Krece 13, Post. box 51 Banja Luka 78102, Bosnia and Herzegovina/RS

<sup>2</sup> Pan-European University "APEIRON" Banja Luka, Faculty of Business Economics, Vojvode Pere Krece 13, Post. box 51 Banja Luka 78102, Bosnia and Herzegovina/RS

segmentation model, offering information and with the possibility of switching users to products and experiences which are offered by specific subjects using the model of voluntary access to the Internet market".

The purpose of our research was to provide an answer to the posed problem: "Whether digitalization of the process would lead to a simpler and faster performance of daily activities?" Also, the research was aimed at collecting and analyzing data on the capacities of the spa-recreational potential. Regarding the posed problem, the authors defined the hypothesis that the digitization of business processes leads to business improvement. The research concept was based on the Triple Helix model in such a way that it is implemented in cooperation with a business organization, government representatives and higher education institutions. As a result of the research and project, we have a completed product that was created with the cooperation of the interdisciplinary team and the company. The authors suggested an adequate solution for the development of spa and recreational potential in the Republic of Srpska and created a platform that can be the basis for the promotion of the entire tourist potential of the Republic of Srpska. The Triple Helix model also includes a user-oriented innovation model to fully utilize the potential of all participants, and not only those who are in a given organizational system, as in the closed innovation model (Novakovic, 2018). Mutual relations can be reflected in the financing of research done by young researchers and professors at the university to realize priority programs defined by governments as shown in Figure 1 (Leydesdorff & Ivanova, 2016).



**Figure 1.** TripleHelix Model

**Source:** Leydesdorff & Ivanova, 2016

It enables representatives of all three participants: university, government, and industry to understand the problems themselves. The Triple Helix model does not exclude concentrating on two of the three participants by studying, for example, university-industry relations (Clark, 1998), however, the third participant must at least be recognized as an additional source of variation (Leydesdorff, 2012). The Triple Helix model for innovations can also be used for guidance on network development, and knowledge transfer, highlighting the importance of the role of universities and the incubation of new start-ups (Leydesdorff, 2012).

## 2. METHODOLOGY

The methodology used in this research was primarily based on analytical methods along with cabinet and field research. The authors focused on the cabinet's data collection and literature review in the field of tourism development and the Triple Helix model. During field data collection,



authors used the interview method, and managers of spas in the Republic of Srpska were interviewed. An indispensable link of all research nowadays is the connection with the Sustainable Development Goals. Therefore, the research was directly connected with the Sustainable Development Framework in Bosnia and Herzegovina through Goal 3 – Good health and well-being. The research the authors conducted was done based on interviewing spa managers. Through the interview, we heard their attitudes regarding the innovative activities they undertake, as well as the degree of digitalization of business processes. The interview was conducted in the period August - December 2022. At the beginning, we should note that most of the business entities that were the subject of research are privately owned, while three spas are public companies.

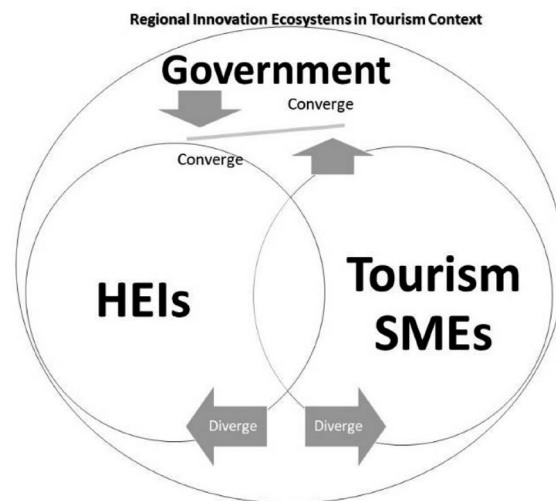
Guided by the information that eight spas are operating in the territory of Republika Srpska<sup>3</sup>, we suggested to the managers of these economic entities to interview them. Out of a total of eight registered spas, we spoke with representatives of seven spas. On the other hand, the answer from the management of the Public Health Institution, Institute for Physical Medicine, and Rehabilitation "Dr. Miroslav Zotović", Banjaluka was that this public health institution is focused more on the health segment of business, than on the spa, and that it is not an adequate interlocutor for the needs of this research. We conducted the interview through pre-defined questions.

The first segment of the conversation was related to the innovative and promotional activities of spas in the Republic of Srpska, and the degree of occupancy of accommodation facilities, while the conversation continued towards the expressed need for digitalization of business.

We also draw attention to the limitations we have had during the research. Namely, the sample of respondents is limited, there are eight registered spas in the Republic of Srpska, we note that out of the total number of potential respondents, the research was conducted with 87.5% of participants. Another limitation of the research is that managers in spas did not adequately monitor the effects of the existing digitalization processes that they partially implemented in their facilities.

When we talk about the economy and society based on knowledge, the university should overcome its traditional role in society, to focus on educational and research activities to stimulate the social and economic development of society (Zhou & Etzkowitz, 2021). Higher education institutions (HEIs) should participate in the economic development of the regions in which they are located (Soyer et al., 2020). Therefore, it is necessary to direct forces during cooperation to effectively connect corporative and academic knowledge systems (Lopes et al., 2021). The Triple Helix model emphasizes the importance of the university and gives it a significant role in the innovation process, as it initiates changes in the environment and actively participates in the process of those changes (Fidanoski et al., 2022). Tourism is a globally important sector with strong competitiveness and a high level of knowledge transfer (Tučková et al., 2017). Scientists also accept the Triple Helix model for the development of innovative projects and sustainable solutions in the tourism sector as well, we can see it in Figure 2 (Lopes et al., 2021).

<sup>3</sup> Companies within this economic activity have also formed a special group of spas within the Association of Trade, Tourism and Hospitality at the Chamber of Commerce of the Republic of Srpska. (<https://komorars.ba/grupacia-banja/>, accessed on 17.10.22), the spas registered so far in the Republic of Srpska are: "Health tourism center "Banja Vrućica", Teslić, "Banja Laktasi", Laktasi, "Banja Dvorovi", Bijeljina, "Banja Kulaši", Kulaši, Prnjavor, "Institute for Physical Medicine and Rehabilitation Dr. Miroslav Zotović, Spa "Slatina", "Hospital for Physical Medicine and Rehabilitation "Mlječanica", Kozarska Dubica, Public institution Rehabilitation Center "Vilina Vlas", Visegrad, Spa "Ozren".



**Figure 2.** The Triple Helix Model in Tourism

Source: Lopes et al., 2021

During the cabinet research work, we reviewed strategic documents and statistical data on the participation of tourists in the total GDP of the Republic of Srpska. It was noticed that there are already adopted strategic documents related to the development of tourism in the Republic of Srpska with a special emphasis on spa tourism. The Ministry of Tourism adopted the Tourism Development Strategy. Although spa tourism is well developed in the Republic of Srpska and the spas of Srpska are clearly distinguished as traditional spas that influence health improvement, a sufficiently good marketing mechanism that would promote the potential of the Republic of Srpska spa tourism abroad has not yet been developed. Spas of the Republic of Srpska have a developed brand in the Republic of Srpska thanks to the cooperation with relevant ministries.

Spa resorts, according to the definition of the Republic Institute for Statistics of the Republic of Srpska, are those resorts where curative properties of thermal and mineral waters and other geological and mineral properties were determined scientifically and medically or empirically, and which also have adequate facilities for treatment and rehabilitation of visitors.

### 3. RESULTS

Eight spas are operating in the Republic of Srpska, which were also identified through the strategic documents of the Republic of Srpska, and during our cabinet research. Strategic documents are aimed at developing the potential of the Republic of Srpska, which already exists thanks to the natural wealth we have. The natural resources and natural potential that a locality offers are crucial for spa tourism. The Tourism Development Strategy of the Republic of Srpska 2021-2027, following the Spatial Plan of the Republic of Srpska until 2025, identified six potential tourist zones, and tourism clusters were defined based on them. Tourist zones are planned according to natural resources. At least one spa operates in most of the identified tourist zones, which represents the backbone of spa tourism in the Republic of Srpska. By reviewing the statistical data available on the website of the Republic of Srpska Institute of Statistics, we can see that the coronavirus pandemic has had a negative impact on the participation of tourism in the overall economic activity on a global scale, also in the Republic of Srpska. Table 1 shows the percentage of domestic and foreign tourists in the total number of tourists visiting spas. We see that in 2019 there was the smallest difference in that participation and that year, the participation of foreign tourists in the total number of tourists who visited the spas was 44.21%.

**Table 1.** The Percentage of Domestic and Foreign Tourists  
in the Total Number of Tourists Visiting Spas

%	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
<b>Domestic tourists</b>	72.43	71.29	68.25	63.95	65.44	62.01	58.26	57.75	55.79	77.01
<b>Foreign tourists</b>	27.57	28.71	31.75	36.67	34.56	37.99	41.74	42.25	44.21	22.99

**Source:** Own calculations

After conducting field research, and analyzing the data we collected through interviewing spa managers we can state that the representatives of the spas in the Republic of Srpska already invested part of the profit from the previous year in innovation and digitalization of business. Namely, to the first question, “What percentage of profit do you invest in business innovation (product, service, process innovation), the answers are distributed as in Table 2.

**Table 2.** What percentage of profit do you invest in business innovation  
(product, service, process innovation)

Answers of the spa managers	Number of the answers	%
Less than 5%	2	28.60%
More than 5%	5	71.40%
Total	7	100,00%

**Source:** Own calculations

The next question was: “Did the investment in business innovation of your company increase profits in the first three years after the innovation?” The answers we can see in Table 3.

**Table 3.** Did the investment in business innovation of your company increase profits  
in the first three years after the innovation

Answers of the spa managers	Number of the answers	%
Yes	6	85,70%
No	1	14,30%
Total	7	100,00%

**Source:** Own calculations

The next two questions were: “Is the capacity of the spa filled throughout the year?” and “What measures are you taking to fill the spa's capacity (additional advertising, special offers, etc.)”. In the Table 4, we can see their answers.

**Table 4.** Is the capacity of the spa filled throughout the year

Answers of the spa managers	Number of the answers	%
Less than 5%	2	28.60%
More than 5%	5	71.40%
Total	7	100,00%

**Source:** Own calculations

Proposals of measures that the respondents suggested and that could be taken to fill the capacities of the spas throughout the year are advertising via internet sales, through the media, social networks, the traditional approach of word-of-mouth promotion, offers via internet sales, visits to trade fairs, advertising through social networks, promotional packages.

To the question: “Do you think that digitization and visualization of the spa-recreational potential would contribute to better utilization of the spa's capacity?” everyone unanimously stated

that the relevant digitization procedures would significantly contribute to business development and better utilization of spa facilities.

The defined hypothesis was “The digitization of business processes leads to business improvement.” Considering the answers of the spa managers we can conclude that our hypothesis is confirmed. Based on the data of our research, the business entity created a web platform and mobile application that enables the digitization of the spa and recreational potential of the Republic of Srpska, which is available at the link: [www.turizamrs.com](http://www.turizamrs.com). Considering the Triple Helix model is made up of three partners, the role of the state in our research was reflected in the investment of grant funds. After the research part, several workshops were held. The first workshop was attended by team members from the University and the management of the “Kulasi” spa. In the following three workshops, which were held on the premises of the University and online, the presenters of Nenasal. Ltd also participated. After creating the conceptual solution, representatives of two more spas were included. The final version of the web platform was created in cooperation with the representatives of “Kulasi” spa, “Vilina Vlas” and “Dvorovi”. In this way, we applied the triple helix model with the aim of sustainable development and promotion of the spa and recreational potential of the Republic of Srpska. We have created a good basis that can be further developed.

#### **4. FUTURE RESEARCH DIRECTIONS**

At the end, we can set directions for the following research. It can be focused on the possibilities of including new and interested parties to form a quadruple or quintuple helix model. The significant development of tourism in the Republic of Srpska can certainly be improved through targeted public campaigns that are focused on the categories of tourists they want to attract. When we talk about spa and recreational tourism, we can certainly focus on the development of tourism destinations. One of the strategic goals of the Tourism Development Strategy of the Republic of Srpska is to improve destination marketing, increase the attractiveness of destinations on the main markets by using a greater number of different distribution channels, and intensify digital communication through social networks. Design and implement traditional, digital, and social media campaigns to attract tourists from priority regions. Also, a recommendation for future research is to examine the possibility of increasing the participation of foreign tourists visiting the spa in the Republic of Srpska.

#### **5. CONCLUSION**

The results of our research and project directly affect the promotion of the Republic of Srpska through the digitalization of its spa and recreational potential. Although the creative economy is mostly identified with an urban context, numerous examples show that rural environments can take advantage of local traditions, crafts, and customs to create attractive products. Universities are a very important link in the creative economy, which should prepare students for the opportunities offered by the digital age through the creation of innovative solutions, products, and processes. Through the realization of our research, we have shown that cooperation is possible, and as a result, we received a simple product that is also in line with the strategic documents of the Republic of Srpska. Therefore, we found an adequate solution for the development of spa and recreational potential in the Republic of Srpska and created a platform that can be the basis for the promotion of the entire tourist potential of the Republic of Srpska. With the development of information and communication technologies and the emergence of the fourth

industrial revolution, neither the industry, nor the education system, nor state governments remained immune to the wave of digitization (Novaković et al., 2022). They are increasingly using digital technology in their daily business. As Pereira et al. (2022) stated the internationalization of companies is increasingly dependent on their digitalization. Advances in information and communication technologies have the potential to create a fundamental transformation in society by fostering the ability to connect and collaborate with different social actors. The tourist business has become more flexible thanks to digitalization (Barashok et al., 2021).

However, the approach of modern companies, to turn to the model of open innovation, is characterized by the specificity that ideas are created outside the company, and that profit can be made even if the company is not the carrier of the creation of a certain value (Novakovic, 2018).

### Acknowledgment

This research was supported by the Ministry for Scientific Technological Development and Higher Education in the Government of the Republic of Srpska (19.030/961-7-2/21).

### References

- Barashok, I. V., Rudenko, L. L., Shumakova, E. V., & Orlovskaja, V. (2021). IOP Conf. Ser.: Earth Environ. Sci. Vladivostok, Russian Federation DOI 10.1088/1755-1315/666/6/062059
- Clark, B. R. (1998). *Creating Entrepreneurial Universities: Organization Pathways of Transformation*. Guildford, UK: Pergamon.
- Decision of the Minister for Scientific Technological Development and Higher Education no. 19.030/961-7-1/21, date: 27.12.2021.
- Fidanoski, F., Simeonovski, K., Kaftandzieva, T., Ranga, M., Dana, L. P., Davidovic, M., Ziolo, M., & Sergi, B. S. (2022). The triple helix in developed countries: when knowledge meets innovation? *Heliyon*, 8(8), e10168. <https://doi.org/10.1016/j.heliyon.2022.e10168>  
<https://www.turizamrs.com/>
- Kurek, A. K., Heijman, W., Ophem, J., Gędek, S., & Strojny, J. (2020). Geothermal spas as a local development factor, the case of Poland. *Geothermics*. Volume 85, 101777, ISSN 0375-6505, <https://doi.org/10.1016/j.geothermics.2019.101777>
- Leydesdorff, L. (2012). The Triple Helix of University-Industry-Government Relations forthcoming in: Elias Carayannis and David Campbell (Eds.), *Encyclopedia of Creativity, Innovation, and Entrepreneurship*, New York: Springer. Available at SSRN: <https://ssrn.com/abstract=1996760> or <http://dx.doi.org/10.2139/ssrn.1996760>
- Leydesdorff, L., & Ivanova, I. (2016). "Open innovation" and "triple helix" models of innovation: can synergy in innovation systems be measured? *Journal of Open Innovation: Technology, Market, and Complexity*, 2(3), 1-12. <https://doi.org/10.1186/s40852-016-0039-7>
- Lopes, J. M., Oliveira, M., Lopes, J., & Zaman, U. (2021). Networks, Innovation and Knowledge Transfer in Tourism Industry: An Empirical Study of SMEs in Portugal. *Social Sciences*, 10(5), 159. MDPI AG. Retrieved from <http://dx.doi.org/10.3390/socsci10050159>
- Lund, J. W., & Boyd, T. L. (2016). Direct utilization of geothermal energy 2015 worldwide review, *Geothermics*, Volume 60, Pages 66-93, ISSN 0375-6505, <https://doi.org/10.1016/j.geothermics.2015.11.004>
- Nistoreanu, P., & Aluculesei, A.-C. (2021). Can Spa Tourism Enhance Water Resources and Turn Them into a National Brand? A Theoretical Review about the Romanian Case. *Information*, 12(7), 270. MDPI AG. Retrieved from <http://dx.doi.org/10.3390/info12070270>

- Novakovic, V. (2018). Upravljanja inovacijama. Panevropski univerzitet Apeiron. Banja Luka. Republic of Srpska. BiH
- Novaković, V., Milovanović, M., & Gligorić, D. (2022). Possibilities for Public Sector Management Improvement by the Digitalization of Financial Management and Control System in the Western Balkan Countries. Vol. 2, No. 2, pp. 56 – 77, DOI: <https://doi.org/10.2478/jfap-2022-0009>
- Pavlic, I., Svilokos, T., & Suman, T. M. (2014). Tourism, Real Effective Exchange Rate and Economic Growth: Empirical Evidence for Croatia. *International Journal of Tourism Research*, 17. 10.1002/jtr.1986.
- Pereira, C. S., Durão, N., Moreira, F., & Veloso, B. (2022). The Importance of Digital Transformation in International Business. *Sustainability*, 14(2), 834. MDPI AG. Retrieved from <http://dx.doi.org/10.3390/su14020834>
- Soyer, K., Ozgit, H., & Rjoub, H. (2020). Applying an Evolutionary Growth Theory for Sustainable Economic Development: The Effect of International Students as Tourists. *Sustainability*, 12(1), 418. MDPI AG. Retrieved from <http://dx.doi.org/10.3390/su12010418>
- The Tourism Development Strategy of the Republic of Srpska 2021-2027. Ministry of Trade and Tourism. <https://www.vladars.net>
- Tučková, Z., Jurigová, Z., & Kuncová, M. (2017). Knowledge as a basis for sustainable tourism in terms of V4 countries. In: Proceedings of the 18th European Conference on Knowledge Management (ECKM 2017), Barcelona: Academic Conferences Ltd., s. 991-998. ISSN 2048-8963. Retrieved from <https://search.proquest.com/docview/1967754688?pq-origsite=gscholar>
- Zhou, C., & Etzkowitz, H. (2021). Triple Helix Twins: A Framework for Achieving Innovation and UN Sustainable Development Goals. *Sustainability*, 13(12), 6535. MDPI AG. Retrieved from <http://dx.doi.org/10.3390/su13126535>



## Analysis of Stay of Cruise Ships in the Port of Kotor

Nikola Konjević<sup>1</sup>   
Sava Popović<sup>2</sup> 

Received: August 30, 2023

Accepted: November 20, 2023

Published: March 16, 2024

### Keywords:

Cruise tourism;  
Transit cruise port;  
Bay of Kotor;  
Adriatic Sea



Creative Commons Non Commercial CC BY-NC: This article is distributed under the terms of the Creative Commons Attribution-NonCommercial 4.0 License (<https://creativecommons.org/licenses/by-nc/4.0/>) which permits non-commercial use, reproduction and distribution of the work without further permission.

**Abstract:** *The business mission of ports specialized in receiving cruise ships is the optimal use of capacity for the reception and dispatch of ships and tourists sailing on them while applying all safety, security and environmental standards. Hence, the aim is to maximize the number of ship and passenger arrivals, and their time spent in the port. Using the port of Kotor example, this paper presents the achieved results of this mission.*

*The main goal of reviewing this topic is to determine the correlation between the size of a ship and the place of its stay in the port and to define tendencies regarding the length of its stay. The paper also seeks to affirm the position of Kotor as a recognized point on the itinerary of cruise ships sailing the Adriatic and the Mediterranean.*

## 1. INTRODUCTION

The Port of Kotor is an Adriatic port, located at the extreme Southeastern part of the Bay of Kotor in Montenegro. The geographical position is determined by the coordinates: N 42° 25' 52.80" - E 018° 45' 49.34. The official UN/Locode of this port is MEKOT. The position of the port concerning the environment makes it a natural shelter and very suitable for safe mooring and stay of ships and yachts. It is inextricably linked with the City of Kotor, which is located on the alluvium of the Skurda River that flows along its northern walls and the Gurdic spring that comes out along its southern walls. The slopes of Mount Lovcen with Saint John's Hill (260m) rise above it in the East, while the sea connects it with the world in the Southwest.

Data on the number of passengers, available in the Kotor Historical Archive, date back to 1925 (Konjević, 2003). "Back in 1952, 31,524 passengers passed through the port of Kotor, while that number increased to 64,988 in 1930. The period (1925–1930) is characterized by an increase in the number of passengers with a growth index greater than one hundred for all years, except in 1927. Monthly oscillations are noticeable, so July or August are the months with the highest passenger traffic, almost as a rule." (p.18).

The port of Kotor, as the main cruising port of Montenegro, has an important role not only in the development of this type of tourism but also in the tourism industry, dominantly in Kotor, the Bay of Kotor, and neighboring municipalities. As already emphasized above, its suitable geographical position, climatic and navigation conveniences, cultural and historical values, as well as the wealth and diversity of facilities in the hinterland, positioned Kotor as an important transit cruise port on the Eastern coast of the Adriatic. In this connection, the focus of interest of this paper is on the visiting ships with very popular itineraries for cruises on the Adriatic Sea and

<sup>1</sup> Faculty for Mediterranean Business Studies, Street Luke Tomanovica 1, 85330 Tivat, University Adriatik, 85000 Bar, Montenegro

<sup>2</sup> Faculty for Mediterranean Business Studies, Street Luke Tomanovica 1, 85330 Tivat, University Adriatik, 85000 Bar, Montenegro

the Mediterranean. These determinants indicate that the ships that visit the port of Kotor also represent the offer that the world's most famous shipping companies offer to tourists as tourist cruise packages in the Mediterranean.

At the same time, the business mission of ports specialized in the reception of cruise ships is the optimal use of capacity for the reception and dispatch of ships and tourists sailing on them, with the application of all safety, security and environmental standards. Therefore, the goal is to maximize the number of ship arrivals and passengers, and their time spent in the port. *This paper aims to determine and present the correlation between the size of a ship and the place of its stay in the port of Kotor, as well as to define the tendencies regarding the length of its stay.*

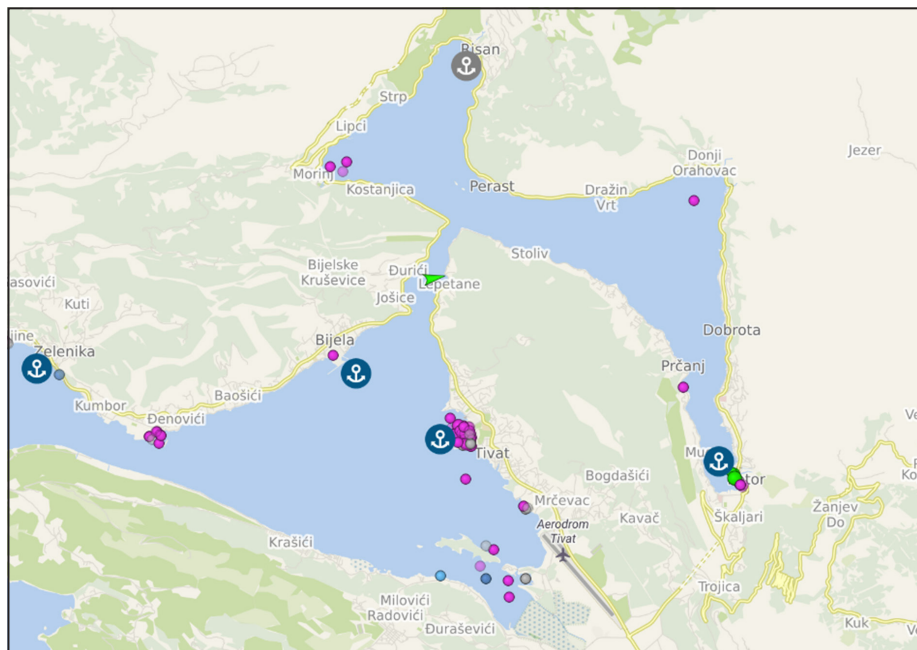


Figure 1. Location of the Port of Kotor

Source: VesselFinder, 2023

## 2. POTENTIAL, MANAGEMENT AND USE OF THE PORT OF KOTOR

The present-day form of the operational quay of the Port of Kotor was designed during its reconstruction carried out after the catastrophic earthquake that struck the Montenegrin coast in 1979. According to official data of the "Port of Kotor JSC" (2023) "the port operational quay managed by the Port of Kotor is 665 m long, including 512 m in the Western part, and 153 m facing the Skurda River. The operational quay can be functionally divided into 5 berths, namely:

- **Waterfront I**, an approximately 150 m long berth. The operational quay on this berth is equipped with 11 bollards.
- **Waterfront II**, an approximately 100 m long berth. Along this operational quay, there is only a 6-9 m wide narrow strip that can be used by ships.
- **Waterfront III**, approximately 250 m long, covers the Southern part of the waterfront.
- **River I** is an approximately 80 m long berth on the Northern part towards the Skurda River.
- **River II** is an approximately 70 m long berth."

In cruise ports, especially in the port of Kotor, anchorages are also important for the reception of passengers. The legislation of Montenegro that regulates ports stipulates: "An anchorage



of a port is a regulated and marked part of the sea intended for maneuvering and anchoring of ships" (Law on Ports, 51/08, Article 4, Item 14). Later Amendments to the Law (Law on Amendments to the Law on Ports, 2013) amended the term in such a way that the words "...and other vessels" were added after the introductory part of the previous definition "port anchorage ... intended", which extended the use of anchorage to other vessels.

Based on the conducted research, the following determinants related to the anchorages of the port of Kotor are noted: "... anchorages at the locations of Dobrota - opposite the Maritime Faculty, Kamenarovici bay and Orahovac bay" ("Port of Kotor" JSC, 2018). Two anchorages are also precisely specified in the document "Plan for the reception and control of the port area for the accommodation of foreign vessels and their crews during the COVID-19 pandemic in 2020" ("Port of Kotor" JSC, 2020), which specifies the location of the zone for self-isolation of a foreign vessel and its crew within the "Port of Kotor JSC" concession area. There are four segments. Two of them are located on the operational quay, while segments 3 and 4 (specified as the areas of restricted access) are at anchorages: "Anchorage No. 2, Kamenarovici bay". The position of this anchorage is used as a quarantine site for large vessels 110-330 meters long. Anchorage No. 3 "Orahovac". The position of this anchorage is used as a quarantine site for large vessels 110-330 meters long" (p.3).

The table below (Table 1) listing the main characteristics of the port's anchorage was drawn up after reviewing all available relevant literature and the Report of the Pilot Office of the Port of Kotor. This numbering will be used in the analyses that follow in this paper.

**Table 1.** Characteristics of the Kotor Port anchorage

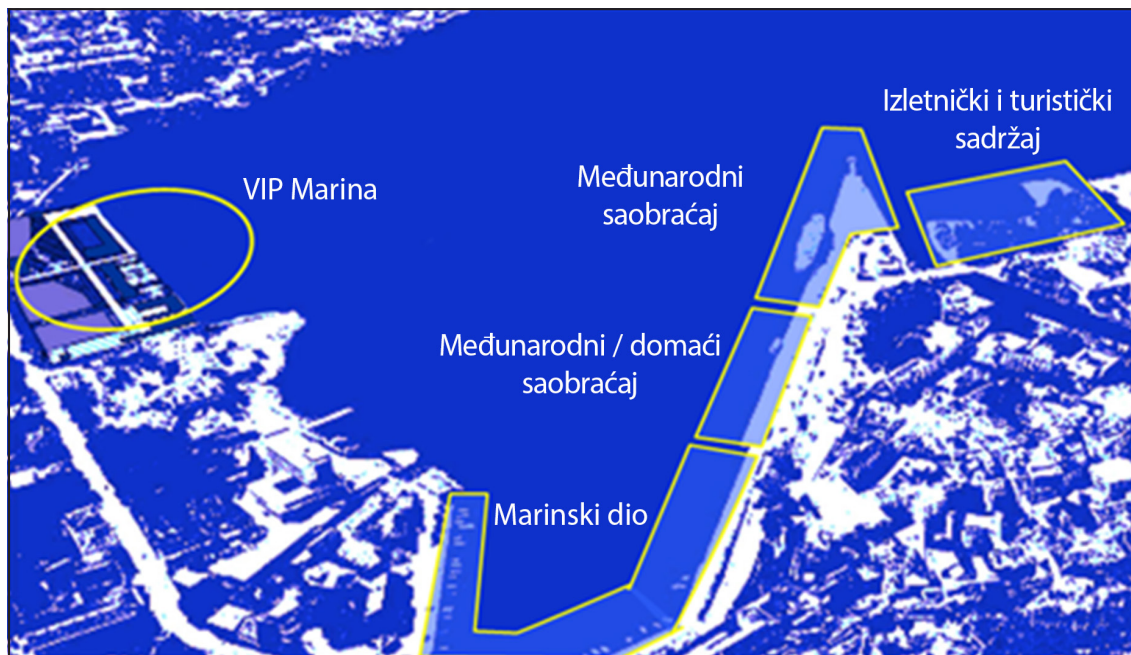
Number of Anchorages	Name	Location	Recommended Anchoring Position
1.	Dobrota I	Dobrota	$\varphi = 42^{\circ} 25,87''N$ $\lambda = 018^{\circ} 46,06''E$
2.	Kamenarovici bay	Dobrota	$\varphi = 42^{\circ} 27,27''N$ $\lambda = 018^{\circ} 45,83''E$
3.	Orahovac bay	Ljuta	$\varphi = 42^{\circ} 28,59''N$ $\lambda = 018^{\circ} 45,22''E$

**Source:** Own processing

The Study prepared by UNEP/MAP-PAP/RAC and the Ministry of Ecology, Spatial Planning and Urbanism of Montenegro within the framework of the "GEF Adriatic" project, with the support of the Global Environment Fund (UNEP/MAP-PAP/RAC & MEPPU, 2021) mentions two points of anchorage for cruise ships in the Bay of Kotor: "The anchorage in front of the port of Kotor with a radius of 312 m (diameter 624 m) with depths of approximately 20 m is a protected shallow anchorage. It does not meet the anchoring criteria for ships of the size of the reference ship. The anchorage can be used for dynamic positioning and a combination of anchoring and direct dynamic positioning..." (p. 18). Anchorage Ljuta is a protected anchorage of medium depth with a radius of 0.7 m, depths of approximately 35 m and a proper bottom for anchoring. It meets the anchoring criteria for ships of the size of the reference ship. The distance from this anchorage to the pier in the port of Kotor is approximately 2.5 m. (p. 18).

**The port of Kotor use**, indicated in the current planning document: *Special Purpose Plan for the Coastal Area* (Ministry of Sustainable Development of Montenegro, 2015), as well as for peripheral port areas in the State Location Studies "Sector 15" and "Sector 16", is shown in Figure 2.

Therefore, the port of Kotor, as a port open to international maritime traffic and a port of national interest, is predominantly oriented to providing services to cruise ships and yachts. The constructed facilities and moorings, as well as the planned land and water area for the future VIP marina, are available for this purpose.



**Figure 2.** Port of Kotor facilities

**Source:** Ministry of Sustainable Development of Montenegro, 2015, p. 84

**The port capacity** is expressed as the number of ships that the port can receive daily: 3 ships/day (one up to 30,000 GRT; one up to 5,000 GRT, one ferry up to 3,500 GRT); 43 yachts/day (9 mega yachts; 20 yachts of 8-24m; 14 yachts on pontoon mooring) and 50 moorings for the local population (boats) (Ministry of Sustainable Development of Montenegro, 2015, p. 83).

**The port management** is observed in the period after the acquisition of the sovereignty of Montenegro when the preparation and adoption of the previously forgotten special **Law on Ports 51/08** was initiated as an institutional framework regulating the organization, management, development and ownership transformation of ports. In other words, it regulates the legal status, division of ports, management, compensation, concession, port order, inspection control and other issues of importance for the ports in Montenegro. The government has decided to limit its role to administrative, regulatory and development matters, and accordingly to create prerequisites for the full privatization of operational or commercial activities. Therefore, the current position on the management of ports of Montenegro is arranged in such a way that ports of national importance are managed by the administrative body responsible for ports, while ports of local importance are managed by the legal entity that manages maritime resources.

According to the **Decision on Designation of Ports According to Significance**, which the Government of Montenegro adopted on 17 March 2011 (Decision number: 03-2529), the ports of national interest include the Commercial Port of Bar, Nautical Tourism Port - Marina Bar, Commercial Port of Kotor, Shipyard Port of Bijela, and Fishing Port of Njivice (Article 2). Port of Budva, Port of Tivat - Porto Montenegro, Port of Tivat – Kalimanj, Port of Risan, Port of Zelenika and Port of Herceg Novi - City Port Skver are regarded as ports of local importance. Decisions of the competent state authorities made changes in the status of ports and titles of port managers for the ports of national importance.

**The stay of ships in the Port of Kotor** is organized through the Company “Port of Kotor JSC“ (“Luka Kotor” AD), which was registered for the provision of services in international maritime

traffic, following the Company Law, on 13 September 2002. For this reason, it is considered necessary to point out the changes in the institutional and legal form of the entity involved in the use and management of the port in recent history.

- "Port of Kotor" is a successor to the Labour Organization "Port of Kotor", which was founded on 12 July 1988 by the Decision of the Kotor Municipality Assembly, to manage the port of Kotor and other ports on the territory of the Municipality, including the associated coastal zone. Later amendments to the legislation caused the Company's name to be changed to Social Enterprise, which was organized as the Public Enterprise "Port of Kotor" by the Decision of the Municipal Assembly on 27 January 1992. The existing Joint Stock Company "Port of Kotor" - Kotor was registered in accordance with the Company Law on 13 September 2002.
- The field of activity in which the Company provided services was also changed following the competences related to the coastal zone management. Thus, the use and management of the Labour Organization and Social Enterprise "Port of Kotor", and the Public Enterprise "Port of Kotor" was assigned to the Public Enterprise for Coastal Zone Management following the Decision on the Coastal Zone of the Municipality of Kotor (the entire area that was under the jurisdiction of the Municipality) pursuant to the Coastal Zone Management Law of 1992. Later, in changed global and economic circumstances, the Agreement was amended by an annex concluded with the Public Enterprise for Coastal Zone Management of Montenegro, Budva. Immediately before the expiry of the term of validity of the mentioned Agreement, in order to maintain the continuity of the substantial and legal position of the user-operator of the Port of Kotor, the Government of Montenegro passed the Conclusion dated 14 May 2015 by which the area of the Port of Kotor was ceded for economic use in the full scope of application as in the mentioned Agreement on the Coastal Zone Use.
- The adoption of the above-mentioned Law on Ports introduced the starting principle according to which port land and infrastructure were state property, while long-term concessions give the right to use them to companies that own the superstructure and provide port services. In this way, the essential determination of the state to limit its role to administrative, regulatory and development tasks is defined (essentially a "landlord" model). In accordance with the new legal solution, at their 104<sup>th</sup> meeting held on 27 December 2018, the Government of Montenegro passed the Decision awarding the priority concession to the "Port of Kotor" JSC Kotor and accepted the Agreement on the priority concession for the economic use of the commercial port of Kotor. Accordingly, this Joint Stock Company is the concessionaire for the commercial use of the Commercial Port of Kotor for 12 years.

The thematic section below includes information obtained regarding the parameters related to the stay of ships in the port of Kotor and their technical and operational characteristics.

### **3. ANALYSIS OF THE STAY OF SHIPS IN THE PORT OF KOTOR (2014–2018)**

The section above noted that cruise ships could use two berths and three anchorages during their stay in the port of Kotor. The data on the arrival of ships and passengers over a longer period were published earlier (Konjević, 2021, p. 113-118), including an overview of tourist visits during the COVID-19 pandemic. "The year after, in 2021, MV La Belle de l'Adriatique was the first ship to enter the port after its closure to traffic. In addition, in June, Kotor was visited by three other ships with a total of 487 tourists on board. At the end of the year, there was a total of 64 cruise ships with 9,139 passengers" (Konjević et al., 2023, p. 223). The data on the monthly frequency of ship arrivals for the period 2014-2018 are summarized below, and classified into

six categories (Table 2). The first, second, third, fourth, fifth and sixth categories include ships with LOA up to 100 m, 100-150 m, 150-200 m, 200-250 m, 250-300 m, and 300-350 meters in length, respectively. This system of categorizing ships by length was applied as relevant due to the fact that records are kept according to these criteria in the port of Kotor, which was used to create the table below.

Analyzing the data on the number of ships that visited the port starting in 2014, the following conclusions are drawn:

- The ships that visited the Port of Kotor were dominantly those classified in the fifth category (250-300 m), or 35.17 % in total cumulatively. On average, 181 ships of this length visited the port each year, that is, 27.90% on the five-year monthly level. The month of September is the most interesting for these ships (141 ships), while these ships have not visited Kotor in February. The ships from this category include: "MSC Musica"; "Rhapsody of the Seas"; "Norwegian Star". During 2018, the mentioned ships had 30, 24 and 20 calls, respectively, in the port of Kotor.
- The first category ships, up to 100 m LOA, with 562 total calls, take the second place. This means that an average of 112 of them came each year. Those are represented by "Athena", "To Callisto", "Crystal Esprit" and "Artemis", with 26, 17, 12 and 11 calls, respectively, during the last analyzed year.
- The second category of ships, 100-150 meters in length, occupy the third place in terms of the number of calls. The number of their calls is the highest in September (110), while in February even ships of this category did not visit Kotor. The world's largest sailing ship "Wind Surf", and the ships "Azamara Quest" and "Pacific Princess" represent this category.
- The fewest calls are made by mega cruisers, which visit the port most often from April to September. In 2018, the port of Kotor was visited by "Celebrity Eclipse".

**Table 2.** Monthly frequency of ship arrivals in the Port of Kotor (2014-2018)

Month/ Period	LOA / Category						Total
	2014-2018						
	1	2	3	4	5	6	
<b>January</b>	21	2	0	0	1	0	24
<b>February</b>	34	0	0	0	0	0	34
<b>March</b>	31	7	1	9	3	0	51
<b>April</b>	28	17	5	24	52	3	129
<b>May</b>	51	55	34	46	116	8	310
<b>June</b>	68	76	36	40	125	6	351
<b>July</b>	75	80	24	38	139	8	364
<b>August</b>	76	85	32	41	131	12	377
<b>September</b>	71	110	49	43	141	9	423
<b>October</b>	48	55	42	52	123	5	325
<b>November</b>	26	2	19	24	59	2	132
<b>December</b>	33	2	0	1	14	0	50
<b>Total:</b>	562	491	242	318	904	53	2570

**Source:** Own processing of data obtained from the "Port of Kotor JSC"

The average length of ships visiting the port is 182.07 m (Table 3). As can be seen from the table below, it is correlated with the previously presented data regarding the number of ship arrivals by category.

**Table 3.** Average values of ships for the period 2014-2020

Year	Average Value		
	Ship length	Period of Stay	Number of Passengers
2014	165.96 m	12h 27min	873
2015	187.9 m	12h 52min	1072
2016	187.79 m	13h 02min	1095
2017	194.58 m	11h 15min	1236
2018	189.6 m	12h 43min	1193
<b>Average</b>	182.07	12.47	1046.33

**Source:** Own processing of data obtained from the "Port of Kotor JSC"

**Table 4.** The main characteristics of ships that dominantly stayed in the port of Kotor in the period 2014-2018

God.	Ship	Characteristics	
2014	 <b>Artemis</b>	Gross Tonnage: 1206 t NRT: 377 t Length: 58,8 m Beam: 11 m Height: 16 m Draft: 3 m Speed: 9.8 kn / 13.6 kn Avg/Max	Flag: Malta IMO number: 9398010 Cruiseline: Overseas Adventure Travel Pax: 50 Crew: 21 Number of cabins: 26
2015	 <b>CL Athena</b>	Gross Tonnage: 1206 t NRT: 374 t Length: 60 m Beam: 10 m Height: 16 m, Draft: 5 m, Speed: 9.6 kn / 13.5 kn	Flag: Malta IMO number: 9398008 Cruiseline: Overseas Adventure Travel Pax: 50 Crew: 21 Number of cabins: 26
2016	 <b>Costa Mediterranea</b>	Gross Tonnage: 85619t NRT: 53 437 t Length: 292,2 m Beam: 32,2 m Height: 50 m Draft: 8 m Speed: 14.6 kn / 24.1 kn	Flag: Bahamas IMO number: 9237345 Cruiseline: Costa Cruises Pax: 2680 Crew: 912 Number of cabins: 1057
2017	 <b>MSC Armonia</b>	Gross Tonnage: 65542t NRT: 41 628 t Length: 275 m Beam: 32 m Height: 54 m Draft: 6,7 m Speed: 14.0 kn / 22.6 kn	Flag: Panama IMO number: 9210141 Cruiseline: MSC Cruises Pax: 2340 Crew: 721 Number of cabins: 975
2018	 <b>MSC Musica</b>	Gross Tonnage: 92409t NRT: 64 360 t, Length: 293,83 m Height: 32,31 m Beam: 59,64 m Draft: 7,85 m Speed: 15.0 kn / 22.8 kn	Flag: Panama IMO number: 9320087 Cruiseline: MSC Cruises Pax: 2550 Crew: 987 Number of cabins: 1275

**Source:** Own processing of data obtained from:  
Overseas Adventure Travel, n.d.; Costa Cruises S.p.A., n.d.; MSC, n.d.

In the reporting period, the largest average length of ships was recorded in 2018, while the lowest value was recorded at the beginning of the observed period. Ships in the port of Kotor are docked for less than 13 hours on average, with 1046 passengers per ship.

The first part of this paper analysed the capacity of the port to receive cruise ships and their passengers, in particular emphasizing technical characteristics of the operational quay and port anchorages. The stay of ships in the port was previously reviewed emphasizing the dependence of their size and the available port capacity. Table 4 includes a systematized overview of the technical characteristics of the dominant ships and their other important features

#### 4. CONCLUSION

The Port of Kotor is successfully building its position as the main cruise port of Montenegro, as well as one of the leading transit ports in the Adriatic Sea. This is also confirmed by the fact that the MedCruise Association in its MedCruise Statistics 2022, in the chapter Mayor Ports per MedCruise Region, ranked Kotor as the first Adriatic port based on the total cruise calls and transit cruise passenger movement. At the same time, based on the results achieved in Kotor, Montenegro was ranked seventh out of a total of 22 Mediterranean countries. It is important to emphasize that the current concessionaire of the port of Kotor is the "Port of Kotor" JSC assumed the obligation to install mooring buoys at the site of Plagenti, Dobrota, in order to ensure a better quality stay of ships in the port and to increase the level of safety of moorings of ships up to 350 m long. In order to significantly improve safety and security for large ships on the berth, especially in difficult weather conditions, the construction and installation of a dolphin pylon is also planned.

It has been proven that world-famous cruise companies bring tourists to Kotor and that some of them, such as "MSC Cruises" and "Costa Cruises", are dominant in terms of the number of calls in certain years. Ships belonging to the fifth category 250-300 meters long with a capacity of approximately 2,500 tourists are the most frequent visitors to the port, and that is in September. Small ships up to 100 meters long, with approximately 50 cruise passengers, come second in terms of the frequency of calls in the port. Tourists who use the itineraries of these ships predominantly come to Kotor in September. The fewest calls are made by mega cruisers, which visit Kotor mostly in August. The average time a ship stays in the port of Kotor, more than 12 hours and 40 minutes, is good for transit ports.

Certainly, the planning of the daily - optimal number of ships and passengers that come to Montenegro via the port of Kotor and visit primarily Kotor has to be based on the concept of sustainable development of cruise tourism.

#### References

- Costa Cruises S.p.A. (n.d.). <https://www.costacruises.com/> ( accessed on 22 August 2023)  
Decision on Designation of Ports According to Importance ("Official Gazette of Montenegro", 20/11).
- Konjević N. (2003) *Port of Kotor in the function of passenger traffic*, Pomorstvo, No. 18, Kotor, Year X, p.18.
- Konjević, N. B. (2021). *Interdependence between the Cruise Ship Tourism Development and Historic Cores Using the Example of Kotor, Montenegro*, *International Journal of Scholar*

- Papers, Transformations in Business & Economics, TIBE. Vol. 20, number 1 (52), ISSN: 1648 – 4460, p. 113.*
- Konjević, N. G., Radović, G., & Đukić, A. (2023) *Impact of the COVID-19 Pandemic on Transition in Tourism in the Example of Kotor*, 7th International Thematic Monograph, Modern Management Tools and Economy of Tourism Sector in Present Era, ISSN 2683-5673, Editors: Bevanda, V.; Štetič, S., SBN 978-86-80194-56-1, <https://doi.org/10.31410/tmt.2022-2023>
- Law Amending the Law on Ports, number 14-4/12-3/4EPA 60 XXV, Podgorica, 28 May 2013.
- Law on Ports, “Official Gazette of Montenegro”, 51/08 dated 22 August 2008, 40/11 dated 8 August 2011.
- Ministry of Sustainable Development of Montenegro. (2015). *Special Purpose Spatial Plan for the Coastal Zone of Montenegro*, (SPSPCZ), Baseline Study, *Maritime Affairs*, Project holder MONTECEP Kotor, Podgorica, pp. 18, 83.
- MSC. (n.d.). <https://www.msc.com/> (accessed on 22 August 2023)
- Overseas Adventure Travel. (n.d.). <https://www.oattravel.com/>, (accessed on 21 August 2023)
- "Port of Kotor JSC" (2023). <https://www.portofkotor.co.me/O-luci/polozaj.html> (accessed on 2 August 2023)
- “Port of Kotor” JSC. (2018). *Business plan for a period of 12 years, for which the Premier concession for the port area of the Port of Kotor is requested*, <https://www.portofkotor.co.me/Luka%20Kotor%20Poslovni%20plan%202018.pdf>
- “Port of Kotor” JSC. (2020). *Plan for the port area handling for accommodating foreign vessels and their crews for the duration of the COVID-19 pandemic*, No. 0308-1721, [www.portofkotor.co.me](http://www.portofkotor.co.me) (Date: 1 October 2020).
- UNEP/MAP-PAP/RAC & MEPPU (2021). *Maritime Navigation Safety Assessment with Proposals for Maritime Zones in the Function of Maritime Traffic in Montenegro*. Author: Ivica Đurđević-Tomaš. Ur: PAP/RAC, project “GEF Adriatic“, pp. 66.
- VesselFinder. (2023). <https://www.vesselfinder.com/> (accessed on 22 August 2023)

### Additional reading

- Government of Montenegro, Ministry of Transport and Maritime Affairs, Port Authority of Montenegro, Podgorica. (2013). *Information on ports of national importance*.







# Paleontological Tourism in the Cold World as a Promising Direction of the Arctic Tourism Development

Ekaterina Romanova<sup>1</sup>   
Liudmila Zamorshchikova<sup>2</sup> 

Received: August 30, 2023  
Accepted: November 7, 2023  
Published: March 16, 2024

## Keywords:

Paleontological tourism;  
Zone of permafrost;  
Yakutia;  
Mammoth fauna



Creative Commons Non Commercial CC BY-NC: This article is distributed under the terms of the Creative Commons Attribution-Non-Commercial 4.0 License (<https://creativecommons.org/licenses/by-nc/4.0/>) which permits non-commercial use, reproduction and distribution of the work without further permission.

**Abstract:** *The strategy of the geopolitical component of the Arctic and the North is being updated. Tourism plays an important role in solving social problems, ensuring employment growth, and improving the well-being of the population. In the global aspect, tourism is one of the important areas that affect the growth of the economy, including the development of economic activity areas such as the services of travel companies, transport, communications, trade, production of souvenirs and other products, food and others, moreover, it represents a powerful innovative resource for the socio-economic development of the region. The concept of the development of Arctic tourism in the Republic of Sakha (Yakutia), the most northern territory of Russia, reflects the current situation in the northern regions of the republic, its recreational resources, and tourism potential. Thus, unique natural, historical and cultural resources and objects of historical and archaeological heritage are concentrated on the territory of this region. Such a wide range of potentially attractive tourist sites and complexes can be very popular with Russian and foreign tourists, as well as residents of the republic. The relevance of the research is also connected with the world narrative associated with global environmental at societal challenges – climate changes and sustainable development of the arctic territories and indigenous peoples.*

*One of the important components of Arctic tourism in Russia should be the paleontological tourism in the Republic of Sakha (Yakutia) because of the big zone of permafrost. The promotion of paleontological tourist destinations and knowledge in the modern world is associated with unique finds of fossil fauna (primarily related to the Mesozoic era), as well as ancient monuments associated with the remains of the first people.*

## 1. INTRODUCTION

The Arctic is the most important part of the planet, the state of which largely determines the future of the world community due to its influence on the processes of climate formation and life conditions on Earth as a whole.

Comprehensive research of the Arctic dictates the study of its natural landscapes, cultural sphere and sustainable figurative-geographical models. The relevance of the study is determined by the development of the Arctic doctrine of the Russian Federation, where the geocultural component should become one of the key factors in the development of natural and recreational space that unites the peoples of the Arctic. The problem of finding ways to solve the fundamental problem of studying the geocultural space of the Arctic in the context of the development of a tourism cluster. Considering geoculture as the process and results of the development of geographical images in

<sup>1</sup> Department of Archeology and Ethnography, Institute of Humanitarian Studies and Problems of Indigenous Peoples of the North of the Siberian Branch of Russian Academy of Science, 1. Petrovskogo Str., Yakutsk, Republic of Sakha (Yakutia), 677015, Russian Federation

<sup>2</sup> Institute of Modern Languages and Regional Studies, International Research Laboratory "Linguistic Ecology of the Arctic" North-Eastern Federal University named after M.K. Ammosov, 58 Belinskiy Str., Yakutsk, Republic of Sakha (Yakutia), 677000, Russian Federation

the local and global contexts, the promotion of geocultural images of the Arctic and the North as a tourism product is an area of interdisciplinary research (Romanova & Zamyatin, 2017).

In modern conditions, the strategic importance of the geopolitical component of the Arctic and the North is being updated. Tourism plays an important role in solving social problems, ensuring employment growth and improving the well-being of the population. Currently, in the global aspect, tourism is a powerful resource for the socio-economic development of the region.

With the development of progress, there are fewer and fewer "unexplored" places, at the same time, the development of infrastructure allows a person to more actively penetrate the North, which provides opportunities for the development of tourism: infrastructure, the economy, and an increase in living standards are developing here. The territory of the Russian Federation is a very relevant and "breakthrough" direction. In this context, the study of such a type of tourism as paleontology initiates a new promising direction of tourism in Russia, which is currently only at the stage of conceptualization and implementation. In other countries and regions, this type of tourism is at different stages of development, somewhere it is already being successfully implemented, and somewhere only at the implementation stage.

The concept of the development of Arctic tourism in the Republic of Sakha (Yakutia) reflects the current situation in the northern regions of the republic, its recreational resources and tourism potential. Thus, unique natural and historical and cultural resources, objects of national cultural, historical and archaeological heritage are concentrated on the territory of the region. Such a wide range of potentially attractive tourist sites and complexes can be very popular with Russian and foreign tourists, as well as residents of the republic (Kosolapov, 2005).

## **2. ASSESSMENT OF POTENTIAL FOR THE DEVELOPMENT OF PALEONTOLOGICAL TOURISM IN YAKUTIA**

Paleontological tourism is considered a specific type of scientific tourism or ecotourism, related to the history of life on earth. It is performed in museums, parks, trails, routes, and guided excavations as a link between the preservation of the paleontological patrimony (Carvalho & Da Rosa, 2008, p. 271).

The popularization of paleontological knowledge in the modern world is associated with unique finds of fossil fauna (primarily related to the Mesozoic era), as well as ancient monuments associated with the remains of the first people. In this context, Yakutia is of great interest, since in ancient times the land of Yakutia was the home of huge giants - mammoths, the remains of which can be found today.

It should be emphasized that the first record of a paleontological find of fauna dates back to 1723, where, in the vicinity of the city of Yakutsk, the head of a mammoth and a Siberian rhinoceros was found in a swamp.

The Republic of Sakha (Yakutia) has the unique potential to become a Mecca for the development of Arctic tourism, correlated with northern paleontology, ending with climate change. So, on the territory, there is a unique accumulation of paleontologic finds of mammoth and other fossils, as well as a thermokarst sinkhole formed due to melting permafrost. As is known, Yakutia contains from 60 to 80% of all mammoth ivory in the world.

The total area of the territory for the development of Arctic tourism in the Republic of Sakha (Yakutia) is 1.7 million square meters (55.2% of the territory of the republic).

The territories for the development of Arctic tourism in the Republic of Sakha (Yakutia) represent a single natural-climatic and national-economic complex, characterized by the presence of a large number of water resources, including rivers - Lena, Yana, Indigirka, Olenek, Kolyma, Anabar, located within the boundaries of specially protected natural areas. The coastal area is washed by the waters of the Laptev and East Siberian Seas, which are part of the Arctic Ocean. The archipelago of the New Siberian Islands is located on the territory of the Bulunsky District, which includes the Novosibirsk and Lyakhovsky Islands.

Climatically, the Arctic zone of the republic, isolated by mountain ranges from the impact of humid and warm air masses from the Atlantic and Pacific Oceans and adjacent to the cold seas of the Arctic Ocean, is the coldest continental region of the world. In the Verkhoyansk and Oymyakon depressions, the largest annual amplitudes of air temperature fluctuations are recorded, exceeding 100 degrees Celsius in absolute value.

There are 45 specially protected natural territories of republican significance in these territories, including 2 natural parks, 1 state nature reserve, 29 resource reserves, 9 unique lakes, and 5 natural monuments. Specially protected areas are attractive objects for various types of recreation, such as photographing landscapes, rafting, mountain tourism, sport hunting, and amateur fishing.

8.2% of the population of the Republic of Sakha (Yakutia) lives in the territories of development of Arctic tourism, the resettlement has a focal-dispersed character in predominantly small settlements, 25.5% (20829 people) of the total population of these territories are indigenous peoples of the North, that preserve their own culture.

The contribution of scientific institutions to the popularization of paleontological knowledge must be noted, such as the unique world-class Research Institute of Permafrost, the Mammoth Museum, the Institute of Human Science and Indigenous Studies of the North, studying the cultural heritage and traditional ecological knowledge of indigenous peoples of the North, Institute of Biological Problems of the North, which studies the processes of global climate change. Undoubtedly, these institutions are developing potential resources for tourism activities in the Arctic.

The study of the mammoth fauna in Russia began with fundamental studies of academic expeditions of the XIX–XX centuries. A large number of remains of mammoths were found on the territory of Yakutia. The largest cemetery of mammoths is located in the lower tributary of the Indigirka River on the river Berelyakh.

The end of the twentieth century gave a new surge in paleontology because this period was marked by active finds of mammoth fauna in Russia and the creation of the International Committee on Mammothology in Geneva with branches in Paris, St. Petersburg, and Yakutsk. In Yakutsk, the unique World Mammoth Museum was established in 1991 as a scientific and cultural center for the study of the mammoth fauna, its habitat, and the promotion of scientific knowledge. In 2002, on the territory of the Ust-Yansky region in Yakutia, the head of an adult mammoth was found, later the scientists collected almost its entire skeleton. The Yukagir mammoth became a world «celebrity» at the International Exhibition "EXPO-2005" in Japan.

The basin of the Yana River and the territories adjacent to it are one of the most promising regions in Northern Eurasia for finding not only skeletal remains but also well-preserved carcasses of mammoths, woolly rhinos, and other representatives of extinct animals belonging to the Early Pleistocene-Holocene complexes. The good preservation of the soft tissues of animals is ensured by permafrost, which in Yakutia has an almost universal development. So over the past 10 years, more than 90% of all unique finds of mammoth fauna have been found in the basin of this river.

In the basin of the middle reaches of the river Yana, the reference section of the Upper Cenozoic deposits is Ulakhan Sullar, located on the right bank of the river, Adycha, 8 km downstream from the village Betenkes. The location is a cliff of the 65-80-meter IV-th terrace above the floodplain, on which sediments from the Upper Pliocene to the Upper Pleistocene are exposed. Here, early researchers found and described bone remains of large mammals of the Olersky theriocomplex, originating from the lower, Early Pleistocene layer (Grigoriev & Novogorodov, 2014, pp. 66-67).

Special attention for the promotion of paleontological tourism in Yakutia is given to the unique landscapes of the Arctic permafrost zone. The Cambrian Museum will be created in the capital of the republic. The reason lies in a large biological explosion - a unique phenomenon that occurred on the territory of the Lena Pillars about 540 million years ago, as a result, most ancient organisms acquired the ability to build a skeleton. The most complete sequence of deposits of organisms, according to which it is possible to study the evolution of the living world of the planet, noted the Academician of the Russian Academy of Sciences Alexei Rozanov in an interview for the channel Yakutia24 (<https://yk24.ru/nauka/muzej-kembriya-budet-sozdan-v-yakutii/#>). The museum will become a big and modern research platform, not only paleontological finds will be exhibited here, but also a lot of scientific work will be carried out in laboratories and field conditions in the Lena River Park.



**Picture 1.** The Batagaika crater in Verkhoyansky region of Yakutia

Nowadays one of the popular places visited by scientists is the crater Batagayka, a huge cross-section of permafrost, allowing geologists to dive into northeast Siberia's ice age history. There whimsical phenomena about 10,000 years ago when the Earth was transitioning from the Paleolithic Ice Age into the current Holocene.

The soil in the crevice is about 200,000 years old and has already revealed many fossils: frozen remains of a bison, a musk ox, a mammoth and a 4,400-year-old horse.

### 3. CULTURAL HERITAGE AND TRADITIONAL KNOWLEDGE

Modern paleontology is a highly developed and interdisciplinary science, the results of which are of interest both to specialists in nature and human sciences.

If we turn to the cultural component of the image of the mammoth, then, of course, in the traditional consciousness of the peoples of Siberia and the North, it is associated with the underworld, the lower world. having a negative connotation. So, in the work of S.V. Ivanov "Mammoth in the Art of the Peoples of Siberia" oral stories are given about an animal of enormous size, which is afraid of sunlight and lives underground, making its way with the help of huge horns. Inhabitants of Siberia and the North. never saw a mammoth live, but considered it a real animal. So, "based on a number of their observations of nature, they believed that the destruction of the banks that appear annually as a result of floods, landslides, sudden cracking of ice on the river are the results of underground or underwater movements of the mammoth" (Ivanov, 1949, p. 135). The attitude towards the mammoth among the indigenous peoples of Siberia and the North was twofold: they hunted for the mammoth bone, and on the other hand, they feared it as an animal that could send misfortunes.

According to the traditional belief of the peoples of the Arctic, the mammoth acted as an assistant to the shaman on his way to the lower world. It was believed among the Yakuts that he who found a mammoth bone should not take it, because her master will die.

The worldview of the mammoth among the Yakuts was associated with the underworld - the world of the dead. In the modern culture of the peoples of the Arctic, the image of the mammoth is reflected in iconic objects. The mammoth symbol is the semantic core of images in the Arctic zone. A pre-glacial fossil that no one has ever seen, but thanks to the finds of remains in the permafrost, it was introduced by indigenous peoples into the context of the development of the northern space, creating links between reality and fiction. The local myths of the northern peoples about the mammoth have preserved the original version of the creation of the Earth by the mammoth: "The mammoth made plains, mountains and rocks ... He drains the earth so that a person can roam."

Modern representations of the image are updated through the Mammoth Museum in Yakutsk, the mammoth "Lyubu" (in Yamal), the mammoth "Zhenya" (in Taimyr), as well as the majestic 10-meter Salekhard monument to the mammoth, which has become a symbol of Yamal.

Researchers correlate the mammoth's image with a cryofigure of a Bull of Cold (Romanova & Vanhonnaeker, 2017). Among the Yakuts, the concept of Cold in a symbolic frame mobilizes in its ontology inseparable figures associated with it, including the Water Bull and the Bull of Winter, each of which is associated with the figure of a mammoth.

Thus, the image of the mammoth mobilizes the symbolic frame of Cold as an archetypal matrix. Mammoth cemeteries in the Arctic have always attracted not only scientists but also ordinary people as a meeting with a bygone civilization. The mental map of the Arctic has preserved information about the owners of the ice cold in modern realities.

#### 4. CONCLUSION

Obviously, the Yakut Arctic is famous for its unique natural monuments, culture and ethnography. This is one of the few corners of the Earth where natural landscape complexes, which are the habitat of indigenous peoples with their rich traditions of nature conservation, have been preserved in significant areas. Tourism in the Arctic, and in particular, the paleontological destination has great potential, there are significant reserves in its quantitative and qualitative development. With due attention to the development of the tourism industry, it can become one of the most promising and dynamically developing industries in the Russian region.

However, the Arctic ecosystem is vulnerable, so, the paleontological sites are vulnerable due to global climate warming. It is very important to conduct a comprehensive assessment of the impact of tourism not only on the economic development of local communities but also on the arctic ecosystem, to ensure its sustainability. As well as objects of archaeological tourism must emphasize protection and sustainable development, when we attempt to transform archaeological sources into tourism products (Afkhani, 2021, p. 59), the paleontological sites also must be maintained and protected.

The measures to develop paleontological tourism in the Arctic include assessment of the nature and recreational potential of the northern region; creation of a local travel company; development of tourist facilities and infrastructure; staffing of the tourism industry; advertising and information support for tourism products. It should be noted that the implementation of these tourist routes is possible with a reasonable pricing policy (minimization of transport costs) and, as a result, attractive prices for tourist routes) and develop a new direction of tourism in a particular territory. The attractiveness of the tourist product is determined not only by its purely paleontological orientation but also by the general cognitive component, covering the rich historical, geocultural and ethnographic diversity of the region. The product is promising for the development of tourism in this area, as well as the Republic of Sakha (Yakutia), forming the image of Yakutia as an attractive territory for paleontological discoveries.

#### Acknowledgment

This research was held within the grant No. 075-15-2021-616 from the Government of the Russian Federation for the project «Preservation of Linguistic and Cultural Diversity and Sustainable Development of the Arctic and Subarctic of the Russian Federation», and the grant No.22-28-20325 from the Russian Scientific Foundation «Anthropology of the Cold World: Creative Strategies and Formation of the Positive Arctic Identity (Landscape and Artistic Practices».

#### References

Afkhani, B. (2021). Archaeological tourism: Characteristics and functions. *Journal of Historical Archaeology & Anthropological Sciences*, 6(2), 57–60. <https://doi.org/10.15406/jhaas.2021.06.00246>

- Carvalho, I. S., & Da Rosa, A. A. S. (2008). Paleontological tourism in Brazil: Examples and discussion. *Arquivos do Museu Nacional, Rio de Janeiro*, 66(1), 271–283. ISSN 0365-4508
- Ivanov, S. V. (1949). Mammoth in the art of the peoples of Siberia. *MAE.M-L*, 11, 135.
- Kosolapov, A. B. (2005). *Theory and Practice of Ecological Tourism: Textbook Allowance*. A. B. Kolbovsky (Ed.). M.: KNORUS.
- Romanova, E., & Vanhonnaeker, M. (2017). The mammoth (*Mammuthus primigenius*) as a geocultural image of the North. In *Proceedings of the 4th International Multidisciplinary Scientific Conference on Social Sciences and Arts SGEM 2017* (pp. 739–746). Sofia.
- Romanova, E. N., & Zamyatin, D. N. (2017). Cold World: Two Poles of Measurement. In *Geocultures of the Arctic* (pp. 504). Moscow.







# The Employment of Standardized Recipes, an Essential Prerequisite for Consistent Quality of the Culinary Product

Kliment Naumov<sup>1</sup> 

Received: August 25, 2023

Accepted: December 14, 2023

Published: March 16, 2024

## Keywords:

Standardized recipes;  
Food quality;  
Food consistency;  
Substantial gastronomic product



Creative Commons Non Commercial CC BY-NC: This article is distributed under the terms of the Creative Commons Attribution-Non-Commercial 4.0 License (<https://creativecommons.org/licenses/by-nc/4.0/>) which permits non-commercial use, reproduction and distribution of the work without further permission.

**Abstract:** *A standardized recipe can be defined as guidance for the constant preparation of an assemblage of food or drink at an expected quality. The use of standardized recipes is justified for the reasons of inventory control, creativity, simplicity and consistency. The standard recipe or technical sheet includes certain irreplaceable elements: recipe name, yield, portion size, weight/amount, measure/unit, ingredients, instructions, and notes. The technical sheet is one of the most powerful documents in a food service operation. The benefits of the standardized recipes are vast. It is the basis for the planning of the kitchen and its inventory. It enables the chef to predict and control the quality, quantity and portion cost of the final product by stating all the ingredients and preparation details. There is an increase in consumer satisfaction due to the constant delivery of high-quality and consistent food. There is better control over the yield and the number of the produced portions. Standard recipes are important for faster training of food service employees because of the supply of relevant information and set standards ensuring logical flow of work and increasing labor efficiency. And finally, the risk of foodborne illnesses is limited if the instructions on technical sheets are accurately followed.*

## 1. INTRODUCTION

A recipe is a set of written instructions for producing a specific food or beverage, also known as a formula. A standardized recipe is a recipe producing a known quality and quantity of food for a specific operation (Labensky & Hause, 2011, p. 40). In recent decades, the demand for high-quality food has steadily increased, as has interest in the food quality issue, both in response to market pressure (such as requests from increasingly demanding and knowledgeable consumers) and in response to other factors, such as health and environmental concerns. The consumer of the twenty-first century is a demanding one, concerned with the quality and health benefits of the products he or she purchases. Food quality is a central issue in today's food economics, and the last few decades demonstrated that consumers' concerns for healthier lifestyles and environmental stewardship are driving forces in reshaping food purchasing intentions and food quality perceptions (Petrescu et al., 2019).

It is critical to understand these distinctions and be able to recognize them in the workplace. The use of standard recipes or technical sheets that list the kind and quantity of each item, the preparation and cooking methods, as well as the yield and portion size, is necessary for the restaurant industry to function professionally. These are only the basic elements of the standardized recipe.

<sup>1</sup> University of St. Kliment Ohridski-Bitola, Faculty of Tourism and Hospitality-Ohrid, Kej Makedonija no. 95, 6000 Ohrid, Republic of North Macedonia

## 2. LITERATURE REVIEW

According to Aldrich (1953), the standardized recipe information must be precise in every way. The recommendations for a standardized recipe should include a thorough list of the ingredients in the right weights and measurements with a minimum of abbreviations, a description of each step used chronologically, a yield indication, the size of the utensils to be used, and comprehensive cooking instructions, including time and temperature. The benefits of employing weighed quantities over measured quantities are discussed. Weidlein (1962) asserts that since the beginning of time, the scope of standard development has been spectacular and extensive. Standards have a long history based on documentation or evidence, such as the system of weights and measures. Other standards, like recipe standardization, have fairly short histories. West and Wood (1955) define a "standardized recipe" as "one that has been tested several times and has been found consistently satisfactory in quantity, quality, and yield." According to Shugart (1962), a standardized recipe is one in which the amounts and proportions of ingredients, as well as the methods of procedure, consistently produce a high-quality product. It has been tailored to one's food service in terms of total yield, portion size, and cost.

A standardized recipe should include menu item name - the name of the given recipe, which should match the name on the menu; Total Yield - the number of servings or portions produced by a recipe, as well as the total weight or volume of the recipe; Portion size refers to the amount or size of an individual portion; Ingredient list/quantity - precise amounts of each ingredient (except for spices that may be added to taste); Preparation procedures - Specific instructions for the order and types of operations (for example, blend, fold, mix, sauté); Cooking temperatures and times, as well as HACCP critical control points and limits, are used to ensure that the dish is properly and safely cooked; Special instructions, in accordance with the operation's standard format; Mise en place – a list of small equipment and individual ingredient preparation; Service instructions, including hot/cold storage and plating/garnishing. Standardized recipes may also include cost, nutritional analysis, variants, garnishing and presentation advice, work-simplification advice, suggested side dishes or companion recipes, and images in addition to the items mentioned above.

Standardizing recipes can facilitate process simplicity and HACCP integration. Batch cooking is a common practice in facilities that prepare food in large amounts, so the directions for the standardized recipes will include this information. When drafting recipe instructions or directions, workers' skill levels should also be considered. Terminology within the standardized recipes should be at the skill level of employees, for example, instruct an employee to melt butter and whisk with flour instead of saying "make a roux", if more appropriate for a specific operation. Finally, cooking equipment, temperatures, time, etc. are adjusted for the facility (Egan, 2017).

A quick note on mise en place: having "everything in its place" is a key component to efficiently producing menu items from recipes. Many kitchens will have workstations with standard mise en place items such as a cutting board, salt and pepper, tasting spoons, composting containers, and so on. Standardized recipes can help employees produce menu items more efficiently if they include mise en place for small equipment such as measuring tools, preparation tools (knives, peelers), holding pans, cooking utensils, and so on. Before beginning to prepare a recipe, employees can gather everything they need, decreasing the need to move around the kitchen, kitchen congestion, loss of concentration due to frequent starting and stopping, and mistakes due to interruptions. The clarity and effectiveness of recipe preparation can also be enhanced by providing information about the mise en place for specific ingredients, such as peeling and cutting, with each item.

A standardized recipe is always tailored to a particular operation. It produces a known quantity of a desired quality of food including the cooking time, temperature and utensils that should be chosen, based on the quality of the equipment at hand (Miller & Aldrich, 1963). For example, a different final result will be achieved if the same meal is cooked in a simple furnace or a convection oven. Convection ovens provide a more even and rapid cooking compared to conventional ovens. A real standardized recipe should provide information about meal preparation in different types of cookery devices. They are neither contained in cookbooks nor offered by manufacturers. Yield should be adjusted to the appropriate amount for the required operation. Before a recipe can be considered standardized, it must be tested repeatedly and adjusted to fit the facility's and the chef's needs. Standardized recipes are a useful tool for both chefs and managers. The written forms aid in the training of cooks, the education of service personnel, and the management of financial matters. They contribute to ensuring that clients obtain products of constant quality and quantity. Additionally, they are necessary for precise recipe costing and menu pricing. Each recipe should be thorough, consistent, and easy to read and follow. After writing a recipe into a standardized format, it can be modified. Changing the recipe's scale is one of the most common modifications. Maybe the recipe only makes ten servings and the intention is to make fifty, or vice versa (Gielisse, 2011).

### 2.1. The Value of Standardized Recipes

Standardized recipes are important because they predetermine the cost of the recipe, nutritional value, which everyone is concerned about, and customer satisfaction for repeat business. Cost: Standardized recipes include a list of ingredients and their quantities. Occasionally, the quality of the ingredients is also mentioned (Punitharaj, 2022). It is very simple to calculate the cost of the recipe once the quantity and quality of the ingredients are known. As the quantity increases, so does the cost of the recipe. Although the menu determines what is sold and at what price, the standardized recipe controls both the quantity and quality of what is produced in the kitchen. A standardized recipe specifies the steps to be taken in preparing and serving each menu item. It ensures that every time a customer orders something from the menu, they get exactly what they ordered. Cooking times and serving sizes, for example, must remain constant in a standardized recipe to ensure that the menu items produced are always consistent. Guests anticipate receiving what they pay for. The standardized recipe assists you in ensuring that they do. Any high-quality food service operation must avoid inconsistency. It will make little difference to the dissatisfied customer if you tell him or her that, while the menu item he or she purchased today is not up to your usual standard, it will be tomorrow or the last time the guest visited your establishment (Dopson & Hayes, 2010, p. 59).

The restaurant concept should not be heterogenetic, it should be consistent, and remain constant. Standardized recipes are the foundation of any serious effort to produce consistent, high-quality food at a predictable cost. Without them, cost-cutting efforts are reduced to raising selling prices, reducing portion sizes, or lowering quality. Any recipe can be made more uniform. However, the process can be complicated at times, particularly in the areas of baking and sauce production. It is always best to start with a tried-and-true recipe. Standardized recipes produce a consistent quality and yield whenever the exact procedures, equipment, and ingredients are used and help ensure that the best possible food items are produced every time (Hussain, 2017).

### 2.2. The Stages of Standardizing Recipes

The three stages of recipe standardization are amount modification, product evaluation, and recipe verification. The recipe must be thoroughly examined before being made, its yield must be

verified, and any modifications made during the verification process must be recorded. During the product evaluation step, the acceptability of the final product created from the recipe is examined. At this step, the product is sensory evaluated and its acceptability is determined based on factors including appearance, texture, and ultimately taste. If the product doesn't live up to expectations, the ingredient's quantity is altered. These are all lab studies in which the product goes through many stages. To achieve the specified product quality, various raw materials of varying quality and quantity are used. Even a small amount of a component can alter a product's look.

### 2.3. The Advantages of Standardized Recipes

Although the use of the standardized recipe has advantages for staff and supervisors, it is frequently met with opposition. Even though standardized recipe implementation takes time, it is possible to save time, eliminate guesswork, and reduce quality variance in the long run. It also reduces reliance on cooks or chefs, even if some cooks claim their recipes are kept secret. Two other advantages of using SR are consistency in quality and quantity served. The measurement pattern, however, must be consistent, and all foods must be weighed. For greater precision, a volume measurement must be used with liquids (Silvestre et al., 2022).

Standardized recipes offer numerous advantages that are necessary for a variety of reasons:

- Allow more time and money for skill in food preparation, serving, and merchandising by saving time for both the cook and the manager.
- Reduce guesswork and waste caused by poor quantity estimation and cooking failures.
- Eliminate variation in product quality and quantity, eliminating the need for frequent sampling and “doctoring”;
- Avoid being reliant on any cook or chef.
- Aid in portion control and food cost control by
- Figuring the accurate cost of the food used.
- Estimating yield to be expected.
- Checking losses and making necessary adjustments by use of fewer or cheaper materials.
- Maintaining quality and preventing leftovers.
- Checking for losses and making necessary adjustments by using fewer or less expensive materials (Ericson, 2016).

**Consistency of food quality:** The first advantage of standardized recipes is that the food quality is consistent when it is made and served to customers. A standardized recipe can only produce a consistent product if it has been tried and tasted several times before being declared as a standardized recipe.

**Yield predictability:** Using a regular recipe, the yield of the finished product can be predicted before it is prepared. The benefits of a predictable yield include the ability to prevent recipe overproduction or underproduction, which saves money by preventing food waste or customer unhappiness. Customer satisfaction is increased as a result of the consistent quality of food items provided. A standardized recipe yields consistent and good results every time. Customers are happier when their expectations are met and they recommend you to their colleagues. Standardized recipes ensure the nutritional values of the produced food due to the quantity specification of each ingredient. Customers nowadays are very conscious of the nutritional content of food items, and their preference is for healthy products with other characteristics.

### 3. METHODOLOGY

Ten gastronomy students from the faculty of Tourism and Hospitality-Ohrid were involved in the research of the utilization of standardized recipes (pastry cream case). The research was conducted in the faculty's culinary cabinet in a controlled environment. Five students were given short written instructions on how to prepare pastry cream and the other five were given a detailed standardized recipe. During the previous week, both groups of students watched a video about pastry cream preparation, and afterward, a demonstration by their professor was conducted in the culinary cabinet. The students had the liberty to use the entire inventory available in the faculty's kitchen. The preparation of the cr me p tissier was done separately by the 2 groups of students. Immediately after the completion of the preparation of the pastry cream by each group, a sensory analysis was conducted using the hedonic scale. A control sample was prepared by the gastronomy professor using the recipe of the famous pastry chef [Conticini \(2014\)](#) in order to achieve a maximal comparison effect.

#### 3.1. Sensory Analysis

The sensory evaluation of the pastry cream samples was done with 10 untrained consumers with ages ranging from 18 to 59 years old (50% women and 50% men). An orientation session was provided to the panelists before the sensory analysis. The 9-point Hedonic assessment was used with scores from 1 (very dislike) to 9 (very like), as described by [Peryam \(1957\)](#). Consumers evaluated the appearance, color, consistency, taste, aroma, and smell of the cream samples prepared with the guidance of a standardized recipe and without, respectively. The samples were served at room temperature. For each sample, panelists scored their liking of these characteristics using the 9-point Hedonic Scale (1 – dislike extremely, 2 – dislike very much, 3 – dislike moderately, 4 – dislike slightly, 5 – neither like nor dislike, 6 – like slightly, 7 – like moderately, 8 – like very much, and 9 – like extremely)

#### 3.2. The Simple Pastry Cream Recipe

Pastry cream is one of the simplest but at the same time a very complicated culinary product. It requires very high precision and time management as well as the utilization of specific equipment. One will say it is very simple: In a jug, mix the egg yolks, corn flour, sugar and vanilla extract. Pour the hot cream/milk over the egg mixture, slowly, whilst stirring constantly, then pour back into the pan and heat gently while stirring with the whist, until thick and creamy. And voila the cr me p tissier is ready. But is it as simple as that?

Method: Stirred custard ([Naumov, 2022](#))

Yield:		(1440 g)
Milk	1qt	1 lt
Vanilla bean, split	1	1
Granulated sugar		225 g
Egg yolks	10 yolks	180 g
Cornstarch		75 g

**Table 1.** Pastry cream recipe

Title Pastry cream	Base 3 cups	DATE 15.11.2022.	Prepared by	Portions	
<b>Description</b> Creamy filling, while delicious as is, can also be flavored in an almost infinite number of ways to create the perfect complement to your cake, pie, or pastry. Make sure you have all of your ingredients and equipment on hand before you begin; once the egg yolks begin to cook, they won't wait for you to find your strainer.	<b>Ingredients</b>			<b>Photo</b>	
<b>Phases of preparation</b>	<b>Ingredients</b>				<b>Value</b>
	<b>TYPE</b>	<b>Units</b>	<b>1</b>	<b>2</b>	<b>Total</b>
<b>Instructions</b> In a medium-sized saucepan, stir together 1 liter of the milk, the sugar, salt, and the vanilla bean. (If you're using vanilla extract or Vanilla Bean Crush, add it at the end.) Bring to a simmer over medium heat, stirring to dissolve the sugar. Meanwhile, whisk the cornstarch, flour, and egg yolks with the remaining 1/2 cup (113g) milk. Whisk some of the hot milk mixture with the egg yolks to temper them. This keeps the yolks from turning to scrambled eggs when you add them to the simmering milk. Pour the egg/milk mixture back into the remaining simmering milk. Doing this through a strainer will help prevent lumps later. Bring to a boil, stirring constantly with a whisk, until the mixture thickens and you see the boiling bubbles reach the center of the saucepan. Remove from the heat and strain through a fine strainer into a bowl set in an ice bath. Stir in the butter and vanilla extract. If you're going to flavor the pastry cream with chocolate or some other flavor, this is the time to do it (see variations below). Rub a piece of butter over the surface of the cream, top with a piece of plastic wrap (make sure it touches the top of the pastry cream so it doesn't develop a skin), then refrigerate until cool. Use chilled pastry cream as is for a sliceable cream pie, or a stiff filling for éclairs. Fold in the whipped cream, just before using, for a softer filling. Pastry cream will keep, covered in the refrigerator, for up to 5 days. After that, it may start to weep.	MILK, whole preferred, divided Eggs Butter All-purpose Flour Cornstarch Granulated Sugar Vanilla bean Salt	L piece Kg Tbs Kg Kg piece Tsp	1 8 egg yolks 0,11 0,12 0,16 1 1/2	0,02	1 8 0,13 2 0,12 0,16 1 1/2
<b>Serving:</b>					

Source: Own research

#### 4. RESULTS AND DISCUSSION

The sample marked as F1 is the control sample and it was prepared for a comparison model. F2 is the sample prepared by the students using a simple recipe for the preparation of the pastry cream. F3 is the sample prepared by the students who used a standardized recipe for the cooking of crème pâtissier. The results of sensory analysis on the hedonic scale regarding the F2 sample are very negative. The students failed to meet the requirements and probably missed certain phases in the

process of preparation of the custard. Only the smell of the pastry cream met the sensorial test conducted by the panelists and this is due to the use of original vanilla bean. On the contrary, the students who prepared the cream, following the instructions of the standardized recipe achieved excellent results even though it was the first time for them to prepare custard. All the marks on the sensorial analysis on the hedonic scale were positive and with values above 8, on a scale from 1 to 9. The statistical analysis of this research was conducted by using the SPSS (Statistical Package for the Social Sciences), also known as IBM SPSS Statistics. The statistical tool used in this case was Analysis of variance (ANOVA), an analysis tool used in statistics that splits an observed aggregate variability found inside a data set into two parts: systematic factors and random factors. The systematic factors have a statistical influence on the given data set, while the random factors do not. Analysts use the ANOVA test to determine the influence that independent variables have on the dependent variable in a regression study. More specifically for this research a one-way ANOVA was used for three groups of data (3 different pastry cream batches), to gain information about the relationship between the dependent and independent variables.

**Table 2.** Descriptive results of the sensory analysis of the 3 batches of pastry cream

		N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
						Lower Bound	Upper Bound		
Appearance of pastry cream	F1	10	9.00	.000	.000	9.00	9.00	9	9
	F2	10	4.40	1.713	.542	3.17	5.63	2	7
	F3	10	8.10	.738	.233	7.57	8.63	7	9
Color of pastry cream	F1	10	9.00	.000	.000	9.00	9.00	9	9
	F2	10	4.20	1.229	.389	3.32	5.08	2	6
	F3	10	8.50	.527	.167	8.12	8.88	8	9
Consistency of pastry cream	F1	10	9.00	.000	.000	9.00	9.00	9	9
	F2	10	4.10	1.524	.482	3.01	5.19	2	6
	F3	10	8.10	.568	.180	7.69	8.51	7	9
Taste of pastry cream	F1	10	9.00	.000	.000	9.00	9.00	9	9
	F2	10	4.00	1.333	.422	3.05	4.95	2	6
	F3	10	8.80	.422	.133	8.50	9.10	8	9
Flavor of pastry cream	F1	10	9.00	.000	.000	9.00	9.00	9	9
	F2	10	3.90	1.197	.379	3.04	4.76	2	5
	F3	10	8.70	.483	.153	8.35	9.05	8	9
Smell of pastry cream	F1	10	9.00	.000	.000	9.00	9.00	9	9
	F2	10	6.10	.738	.233	5.57	6.63	5	7
	F3	10	8.70	.483	.153	8.35	9.05	8	9
Overall acceptance of pastry cream	F1	10	9.00	.000	.000	9.00	9.00	9	9
	F2	10	4.30	1.059	.335	3.54	5.06	3	6
	F3	10	8.60	.516	.163	8.23	8.97	8	9

Source: Own research

#### 4.1. Tukey HSD

If you take a look at the Multiple Comparisons table below you'll see that significance values have been generated for the mean differences between pairs of the various levels of the variables (formulation of pastry cream-1; Formulation of pastry cream-2; and Formulation of pastry cream-3).

In our example, the Tukey HSD (Honest Significant Difference) shows that it is only the mean difference between the (F1, F3) groups and the F2 group that reaches significance. The p-value is the standard .05 alpha level, so the 0 hypothesis is rejected. The hypothesis that the utilization

of standardized recipes is a strong precondition for the quality of a culinary product is proved. Two batches of pastry cream were made using technical sheets with precise instructions and they were accepted by the panelists as very high in quality whether in appearance, color, texture, flavor, taste, or smell. The batch that was prepared following the simple instructions for crème patisserie received very low grades on the hedonic scale from 1 to 9, with an average of 4.5, and can be set between 4 – dislike slightly and 5 – neither like nor dislike. The utilization of standardized recipes gives a better chance for professional progress to novice cooks, who see their future as chefs. The standardized recipes are the real precursor for the proper training of high-quality kitchen staff. The comprehension of the standardized recipes demands at least a basic knowledge of the main postulates of gastronomy.

**Table 3.** Multiple Comparisons

Appearance of pastry cream			
Tukey HSD <sup>a</sup>			
Formulation of pastry cream	N	Subset for alpha = 0.05	
		1	2
F2	10	4.40	
F3	10		8.10
F1	10		9.00
Sig.		1.000	.167

Consistency of pastry cream			
Tukey HSD <sup>a</sup>			
Formulation of pastry cream	N	Subset for alpha = 0.05	
		1	2
F2	10	4.10	
F3	10		8.10
F1	10		9.00
Sig.		1.000	.100

Color of pastry cream			
Tukey HSD <sup>a</sup>			
Formulation of pastry cream	N	Subset for alpha = 0.05	
		1	2
F2	10	4.20	
F3	10		8.50
F1	10		9.00
Sig.		1.000	.331

Smell of pastry cream			
Tukey HSD <sup>a</sup>			
Formulation of pastry cream	N	Subset for alpha = 0.05	
		1	2
F2	10	6.10	
F3	10		8.70
F1	10		9.00
Sig.		1.000	.398

Flavor of pastry cream			
Tukey HSD <sup>a</sup>			
Formulation of pastry cream	N	Subset for alpha = 0.05	
		1	2
F2	10	3.90	
F3	10		8.70
F1	10		9.00
Sig.		1.000	.645

Overall acceptance of pastry cream			
Tukey HSD <sup>a</sup>			
Formulation of pastry cream	N	Subset for alpha = 0.05	
		1	2
F2	10	4.30	
F3	10		8.60
F1	10		9.00
Sig.		1.000	.400

Means for groups in homogeneous subsets are displayed.

Uses harmonic mean sample size = 10000

**Source:** Own research

## 5. CONCLUSION

The significance of standardized recipes in ensuring the consistent quality of culinary products cannot be overstated. This paper has illuminated the diverse and unique nature of individual cooking knowledge, emphasizing the combination of theoretical understanding and practical skill acquisition that underpins the successful execution of cooking methods toward the creation of optimal-quality dishes. The mastering of the culinary techniques varies from person to person, spanning from a few months to several years, with each cook possessing a distinct skill set.



Amidst this variation and individuality, the culinary community widely acknowledges the pivotal role that standardized recipes play in achieving excellence in gastronomy. While the verification of yield stands out as a critical step in the standardization process, it is imperative to recognize that other steps in the process are equally indispensable. The challenges of standardizing recipes, particularly the intricacies of recording them accurately, emerge as a substantial obstacle in this pursuit, while the financial aspects surrounding meal costs present comparatively lesser difficulties.

In the complex landscape of culinary artistry, taste emerges as the foremost factor that influences a customer's decision to engage with a dish. This reality underscores the value of standardized recipes as a means to consistently replicate the desired taste and quality across various instances of food preparation. It dispels the myth that culinary creations are solely born out of emotion-driven artistic expression, illustrating that even the most skilled chefs rely on meticulous measurements and clear instructions to achieve desired outcomes.

It is essential to dispel the misconception that standardized recipes diminish the creativity of chefs or restrain their artistic prowess. Rather, standardized recipes serve as a foundational framework that empowers chefs to bring their creativity to life while maintaining the expected quality and consistency. In essence, this paper underscores that even the most accomplished chef can falter without the guidance of a standardized recipe, while a less experienced cook can produce impressive results by adhering to one.

In conclusion, the adoption of standardized recipes emerges as an essential prerequisite for ensuring the consistent quality and quantity of culinary products. This comprehensive approach safeguards against variations arising from individual skill levels and interpretations, ultimately guaranteeing a satisfying and uniform gastronomic experience for consumers.

## References

- Aldrich, P. J. (1953). Quality food means more than recipes. *Journal of American Dietetic Association*, 29.
- Conticini, P. T. (2014). *La Pâtisserie Des Rêves*. Paris: Grub Street Publishing.
- Dopson, L. R., & Hayes, D. K. (2010). *Food and Beverage Cost Control*. New York: John Wiley & Sons.
- Egan, B. M. (2017). *INTRODUCTION TO FOOD PRODUCTION AND SERVICE*. The Pennsylvania State University.
- Ericson, M. H. (2016). Recipe. *Journals.sagepub.com was first indexed by Google in November 2016*, 55-56.
- Gielisse, V. A. (2011). RECIPES for the Modern Batch Kitchen. *Chef Educator Today*, 8.
- Hussain, Z. (2017). Importance of Standardized Recipes in Food Service Settings. *Mathews Journal of Diabetes & Obesity*, 1.
- Labensky, S. R., & Hause, A. M. (2011). *On cooking, A textbook of culinary fundamentals*. New Jersey: Prentice Hall.
- Miller, G., & Aldrich, P. (1963). Standardizing recipes for. *Michigan State University Agricultural Expt. Station Bulletin No. 233*.
- Naumov, K. (2022). ÉCLAIRS AS TOP PASTRY DELICACIES AND THEIR COMPREHENSION BY THE MACEDONIAN GASTRONOMIC AUDIENCE. *Horizons (XXXI)*.
- Peryam, D. A. (1957). *Hedonic Scale method of measuring food preferences*. *Food technology*.

- Petrescu, D. C., Vermeir, I., & Petrescu-Mag, R. M. (2019). Consumer Understanding of Food Quality, Healthiness, and Environmental Impact: A Cross-National Perspective. *International Journal of Environmental Research and Public Health*, 17(1), 169. <https://doi.org/10.3390/ijerph17010169>
- Punitharaj, A. B. (2022). *A STUDY ON EFFECTS OF STANDARDIZED RECIPES OF LOCAL. Tianjin: Journal of Tianjin University Science and Technology.*
- Shugart, G. (1962). Standardized recipes. *School Lunch Journal*.
- Silvestre, D., Serra, M., Afonso, C. M., Pinto, E., & de Almeida, C. M. (2022). Development of an Online Holistic Standardized Recipe: A Design Science Approach. *Sustainability*, 14(9), 5330. <https://doi.org/10.3390/su14095330>
- Weidlein, A. S. (1962). *National Standards in a Modern Economy.* Harper and Brothers Publishers.
- West, B., & Wood, L. V. (1955). *Food Service in Institutions.* New York: John Wiley and Sons, Inc.



# Migration Movement of the Bulgarian Population and Socio-Economic Effects under the Pressure of an Increased Refugee Flow

Kristina Petrova-Hristova<sup>1</sup> 

Received: August 31, 2023

Accepted: November 6, 2023

Published: March 16, 2024

## Keywords:

Migrations;  
Demographic situation;  
Natural increase;  
Refugees



Creative Commons Non Commercial CC BY-NC: This article is distributed under the terms of the Creative Commons Attribution-Non-Commercial 4.0 License (<https://creativecommons.org/licenses/by-nc/4.0/>) which permits non-commercial use, reproduction and distribution of the work without further permission.

**Abstract:** *The migration of the population is a very important element of demographic development. The current demographic situation in the Republic of Bulgaria is very difficult, migration processes are taking on increasingly serious dimensions. After the democratic changes in 1989, now more than thirty years, the demographic processes have a negative sign - negative natural increase, negative migration balance, strong aging of the population, and deterioration of the age structure, which leads to a permanent decrease of the population. There are different reasons - military, political, economic, and climatic problems led to increased refugee flows passing through the territory of the country, which further complicate the socio-economic situation. The employees of the security sector in the Ministry of Internal Affairs are facing huge refugee pressure. Their preparation and actions are extremely important for dealing with any problems that may arise on the territory of the country.*

## 1. INTRODUCTION

In recent years, the topic of demographic processes in the country began to occupy an increasingly wider place in public discussions. Extremely negative demographic processes such as negative natural growth, negative migration balance, aging of the population, as well as deterioration of age structures, become decisive for the future development and normal functioning of the socio-economic processes in the country.

The demographic situation at the moment continues to be critical. The population has continued to decline in recent years. The age dependency ratio continues to rise. As a result of the reduced birth rate and increasing mortality, there is a narrowed reproduction of the population (Bardarov & Petrova-Hristova, 2020).

Against the background of these negative trends, however, another serious problem appears - together with a negative migration balance in the country, we have an increased refugee flow, which is beginning to put pressure on public activities and, above all, security.

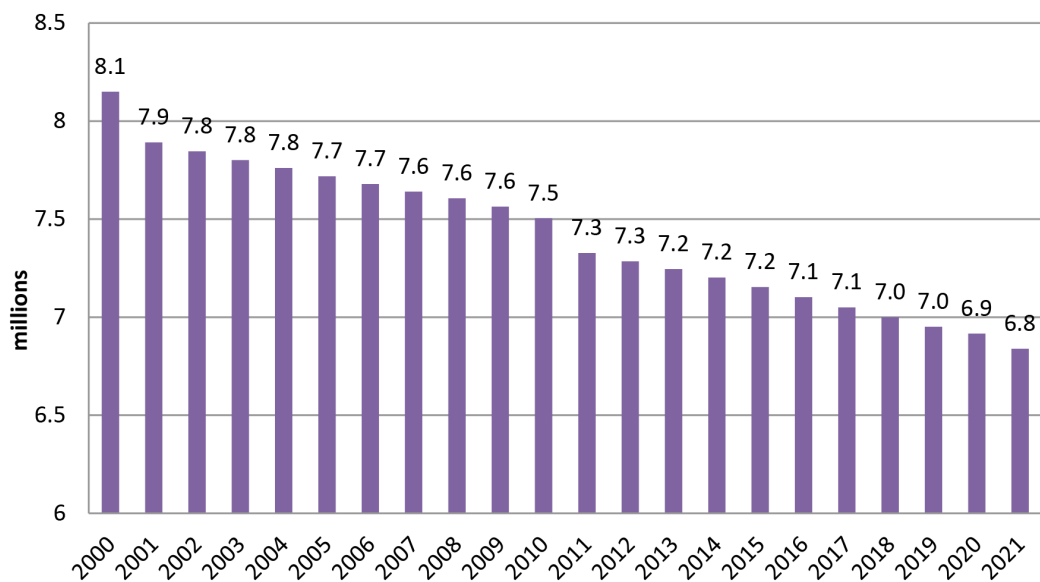
The last year has been marked by numerous incidents of refugees trying to cross the country illegally. That showed the insufficient readiness to deal with the problem and the training and efficiency of the personnel in the security sector.

Based on a personally conducted anonymous survey among employees in the system of the Ministry of Internal Affairs (MIA), we can draw some basic conclusions regarding the preparation, technical security, and personal opinion of the surveyed employees.

<sup>1</sup> Sofia University "St. Kliment Ohridski", Faculty of Geology and Geography, Socio-economic geography department, Tzar Osvoboditel 15, Sofia, Bulgaria

## 2. INTERNAL AND EXTERNAL POPULATION MIGRATION

The migration processes that have been taking place in the country for the past thirty years unfortunately have negative characteristics. After the democratic changes of 1989, the external migration of the Bulgarian population greatly increased, which, in turn, led to a drastic decline in the total number of the population in the country. If during the census in 1985, we recorded the absolute highest number in our demographic statistics of almost 9 million people, then at the present moment, the population in the country is slightly over 6.8 million people (2021) as the trends pointed out by specialists are for a continued decrease in the population (Figure 1).



**Figure 1.** Dynamics of the population of the Republic of Bulgaria in the period 2000-2021

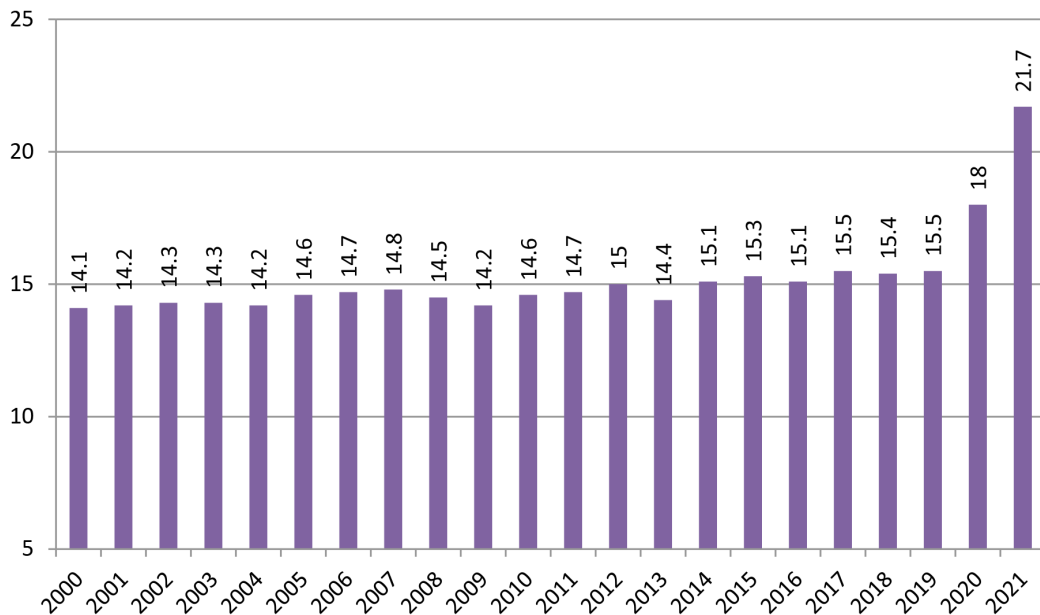
Source: NSI, n.d.

From the led statistics, we can follow the dynamics in the number of the population in the period of the last three national censuses. We have had a serious decline in the last twenty years.

Among the main reasons for this population decline, we can point out the high death rate in the first place. If in the period before the spread of the global pandemic of COVID-19, we had a mortality rate of 14-15‰ (according to the data from the current demographic statistics of the NSI), then this value increases a little in 2020 and 2021. The birth rate in the country has values within the framework of Western European rates, typical of countries that have gone through a demographic transition - about 8‰ (Figure 2).

Under these conditions, the reason we can point to the decrease in population is the high mortality rate and the corresponding deterioration of health care. But there is also another significant reason for the reduction of the population and deepening of the processes of depopulation - the migration processes of the population. After the democratic changes in the country since 1989, a huge part of the population migrated - the so-called "big excursion" is the emigration of over 300,000 people, part of the Turkish minority in Bulgaria. From then until now, a huge part of the population has chosen to leave the country mainly for economic reasons - to find better-paying work, a higher standard of living, and better education and health care. Tracking the data from the mechanical growth statistics, we can see that in the period 2007-2019, we have

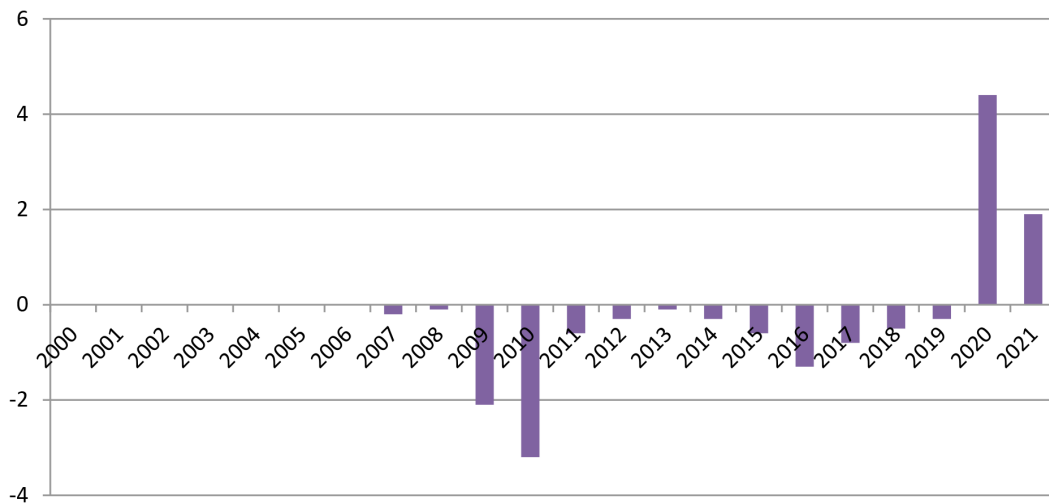
annual negative mechanical growth. The reason for these negative values is the possibility of free movement of the population after our admission to the European Union (EU). Our membership in the union favors opportunities for work and study outside the country, which leads to permanent population migrations to EU countries.



**Figure 2.** Mortality rate in the country in the period 2000-2021

Source: NSI, n.d.

As we mentioned above, the COVID-19 pandemic had an impact not only on the mortality rate values but also on the mechanical growth values - we have positive values for 2020 and 2021, i.e. those settled in the country are more than the emigrants. This is because a large part of the European countries, where there are large Bulgarian diasporas, seriously tightened the measures regarding the spread of the disease and, accordingly, a large part of the Bulgarians chose to return to the country (Figure 3).



**Figure 3.** Coefficient of mechanical growth in the country for the period 2000-2021.

Source: NSI, n.d.

This return is extremely positive because of the lack of labor force that is felt in some sectors and especially because of the greatly deteriorated age structure.

Another problem that we can point to and for which immediate decisions and measures need to be taken is uneven internal migrations. They are characterized by population movement mainly from small settlements (villages and small towns) to large cities. This is a problem, as these processes lead to an increase in the depopulation of many areas in the country, which could subsequently face serious socio-economic difficulties.

The conclusions we can draw are that in the last two or three years, positive values of the migration balance have been observed in the country and there is an opportunity for a favorable development of the demographic processes in the future.

### 3. THE REFUGEE CRISIS IN BULGARIA AND EUROPE

In the last more than a year, an increased flow of refugees to Europe has been observed, with Bulgaria being one of the entry points for migrants to the European continent. The refugees who pass through the territory of the country are mainly from Syria and Afghanistan, but refugees from Ukraine are no exception, as well as many illegal emigrants from third countries (Iraq, Morocco, etc.).

Many European countries are facing the biggest wave of migration since the end of the Second World War, which seems to be a serious challenge not only to the smaller ones but also to the political leaders in the EU. The wars in Iraq and Syria, the political tensions and poverty in many parts of Africa and Asia, as well as the acute water shortages in these regions, seem to be intractable problems at the moment. By adding the population explosion, dysfunctional economies and high youth unemployment, we can gain an idea of the main factors determining emigration to Europe (Bardarov & Tsvetkov, 2017).

In nowadays' conditions of globalization, migration takes on a global scope. This complex socio-economic phenomenon affects a growing number of countries and regions, a significant percentage of the population of which is involved in migration flows for a variety of reasons. In this new and complex geopolitical situation, the protection of the state borders of each country and the territory of the EU as a whole becomes a priority of the security policy (Valcheva, 2014).

The refugee flow is a serious challenge for the internal and external policy of the Republic of Bulgaria. The government must draw serious conclusions from the events that have been going on for the past three years. The fact that Bulgaria remains on the periphery of the refugee influx must be thoroughly analyzed. The factors that redirect this human flow outside the national territory should be indicated. At the same time, unfortunately, the low standard of living is a major shield against the presence of refugees. However, it cannot be an eternal guarantee for our future. Every nation and country works for its prosperity and this will certainly attract people who would like to settle in our territory. The main problem is that of human potential, which remains unresolved and threatens to erode first the economy and then the statehood (Chukov, 2015).

In order to understand the reasons and motivations for undertaking migratory activity, we must examine and know in detail the factors that determine the refugee crisis. According to Bardarov and Tsvetkov (2017), the reasons for the wave of refugees are complex, complicated and accumulated over the years. The collapse of the colonial system led to the creation of many new independent countries in Africa and Asia, which began an independent path of development. Although many of them have sufficient natural and demographic resources, the majority remain dependent on their trade with the

former metropolises and find it difficult to find a way to enter the free market and develop their economies. During the years of their independent development, tension and a negative attitude began to accumulate from the forceful imposition of a new language, European values, Christianity and other cultural features not inherent in the colonized peoples in the past. Moreover, countries in Africa were not created along a natural historical and ethnic path, but according to the borders of the former metropolises. These artificially created countries live from several to dozens, sometimes radically different in language, religion, and way of life, communities. In many of them, due to a lack of democratic practices and history, and due to the economic interest of the former metropolises, extremely corrupt and tyrannical political regimes have been kept in power, which bully the local population.

It is for these reasons - historical, economic, climatic, as well as because of the military conflicts in the Middle East - that the emigrant and refugee flow has significantly increased in the last few years, and especially in the past year. The increased illegal migrant traffic showed how a serious problem Bulgaria has in the "Security" sector - insufficient human resources, necessary equipment, modern equipment, and tactical training. Unfortunately, it is precisely these deficiencies in the security system that have caused several serious incidents involving employees in the Ministry of Internal Affairs (MIA) system. For this reason, for the present study, we prepared an anonymous survey among the employees of the Ministry of the Interior. The surveyed employees are 57 people from the Sofia region and Sofia-city region.

The first group of questions in the survey are basic - gender, age, division and work experience in the MIA system. The average age of the police officers surveyed is over 40 years old. Here we should note that the age of the respondents overlaps with the range of work experience they have. From the results, we can conclude that there is aging among the ranks of Bulgarian police officers, which will prove to be a very serious problem in the future.

The second group of questions from the survey is directed towards the attitudes of the police officers regarding the measures taken to deal with the refugee flow, as well as the technical security and training of the officers. The conclusions we could draw from the answers received are highly negative. According to the prevailing answers, the training of the employees in the MIA system is "insufficient", and the technical support (weapons, aids, vehicle fleet, specialized equipment, etc.) is also "insufficient".

The last group of questions in the survey focused on the characteristics of the refugees encountered by the police - gender, age, and country of origin.

The refugees crossing the territory of the country are mainly male and are characterized by an extremely young age structure - between 15 and 30 years of age. These are people in the economically active group, with countries of origin mainly from Syria, Afghanistan, Iraq and Morocco, for whom it is necessary to take serious measures in the field of integration because a significant part of them remain in Bulgaria and it is extremely necessary to be integrated into the socio-economic life of the country.

#### **4. CONCLUSION**

In conclusion, we can say that it is not possible to make any specific prediction about how the refugee issue will develop, as well as what impact it will have on the demographic processes in the country and especially on the internal and external migration processes. The conclusion we

reached from the conducted survey is that it is extremely necessary to take measures to increase the number of employees in the MIA system, ensure their additional training, and improve technical security. The additional training, explanations, and techniques would contribute to more effective work in the field, the security of the policemen themselves, and a change in the public attitude toward refugees.

### References

- Bardarov, G., & Petrova-Hristova, K. (2020). Changes in the ethnic structure of the Bulgarian population between the last two national censuses 2001-2011. In 6th International Scientific Conference Geobalcanica 2020 (pp. 271-278). Ohrid, North Macedonia. ISSN 1857-7636.
- Bardarov, G., & Tsvetkov, K. (2017). Factors, changes and consequences of the refugee crisis in Europe. Year of SU, GGF, 2(Geography), 109. ISSN 2535-0579.
- Chukov, V. (2015). The wave of refugees in Europe - history, genesis and perspectives. Scientific works of the University of Ruse, 54(Series 5.2).
- NSI. (n.d.). Retrieved from <http://www.nsi.bg>
- Valcheva, A. (2014). The wave of refugees – a threat to security in Europe. Neofit Rilski University.





## Efficiency of Agricultural Soil Withdrawals – Case of Slovakia

Lucia Paľšová<sup>1</sup>   
Dominika Čeryová<sup>2</sup>   
Zina Machničová<sup>3</sup> 

Received: August 30, 2023  
Accepted: November 22, 2023  
Published: March 16, 2024

### Keywords:

Protection of agricultural soil;  
Agricultural land withdrawals;  
Sustainable agriculture



Creative Commons Non-Commercial CC BY-NC: This article is distributed under the terms of the Creative Commons Attribution-Non-Commercial 4.0 License (<https://creativecommons.org/licenses/by-nc/4.0/>) which permits non-commercial use, reproduction and distribution of the work without further permission.

**Abstract:**  *Policymakers, scientists or academic experts agree on the necessity of agricultural soil concerning different areas (e.g. rural sustainability, and so on). In response to the above, the EU is therefore taking various measures in the form of concrete strategies for the protection of agricultural soil. The main aim of the paper was to analyse the current state of agricultural soil and its development in the territory of Slovakia, with a special emphasis on the investigation of agricultural soil withdrawals for non-agricultural purposes. The results of regression and correlation analysis showed a statistically significant dependence between the purpose and several quality groups of withdrawn soil in Slovakia. The most common purposes of soil withdrawals were housing and industry which have a demonstrable impact on the constant decrease of agricultural soil. In conclusion, the authors proposed a complex of systematic measures to reduce the volume of agricultural soil withdrawals.*

### 1. INTRODUCTION

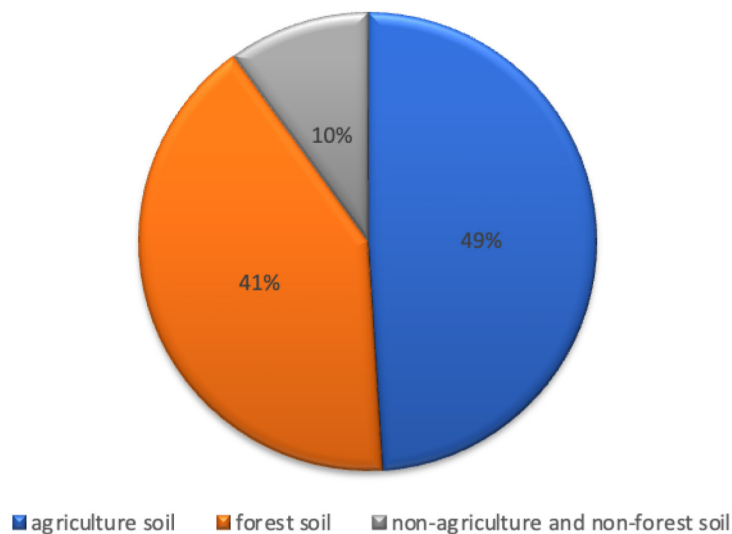
Currently, there is no single definition of soil. Nedd et al. (2021) define soil as a natural resource that humans have utilized for life and various activities. The issue of soil definition is also discussed by many authors from different scientific disciplines (e.g. Fazal, 2013; Schwarcz et al., 2013; Robins, 2016; Paľšová et al., 2019; etc.) who consider that important factors for soil characterization are mainly the functions it performs in relation to the environment and society. This includes ecological and non-ecological functions (Tóth et al., 2008; Kefeli & Blum, 2010; Karis & Jettou, 2013; Margottini, 2013; Efe & Ozturk, 2014) which are completed according to Hraško (2017) with the most important values that increase the demand for land as a natural resource: a) soil as an irreplaceable factor of production as a source of livelihood for animals and humans, b) soil as an elementary space for the construction of industrial enterprises, housing, recreation and relaxation, c) soil as a dedicated space for the construction of transport networks, supply facilities and waste disposal, d) soil as a space for quarrying or mining of raw materials.

Soil is the basis of agricultural activities (Ahmad et al., 2020). Agricultural soil is a non-renewable natural resource that requires careful stewardship in order to achieve sustainable development goals (Hou et al., 2020). FAO (2019) specifies that agricultural soil has a special position in terms of the above-mentioned soil functions. Agriculture and agricultural soil in general: a) provide the largest share of food supplies and ensure food security and food self-sufficiency, b) ensure a critical number of ecosystem services, c) contribute to the increase of urban areas livability and access to green spaces, d) reduce the impact of natural hazards, e) contribute to the efficient management of natural resources, f) reduce food waste and waste production, g) reduce the greenhouse gases emission, h) reduce soil degradation, i), etc. (Viana et al., 2022).

<sup>1</sup> Faculty of European Studies and Regional Development, Slovak University of Agriculture in Nitra, Trieda Andreja Hlinku 2, 949 76 Nitra, Slovakia

<sup>2</sup> Faculty of Economics and Management, Slovak University of Agriculture in Nitra, Trieda Andreja Hlinku 2, 949 76 Nitra, Slovakia

<sup>3</sup> Faculty of European Studies and Regional Development, Slovak University of Agriculture in Nitra, Trieda Andreja Hlinku 2, 949 76 Nitra, Slovakia



**Figure 1.** Share of individual types of soil on the total area of the Slovak Republic

**Source:** Own processing according to the [Statistical Yearbook on Soil Fund, 2021](#)

Agricultural soil of varying quality in Slovakia represents 49 % - the majority of the Slovak Republic's total area (Figure 1.) As a result, the Slovak Republic can be considered a primarily rural state.

The agricultural sector has an important role in sustainable rural development. [Pašakarnis et al. \(2013\)](#) attribute the special importance of rural development to the territory of the European Union, considering that more than half of the population in the member states lives in rural areas. [Edwards et al. \(2012\)](#), [Karlsson and Rydén \(2012\)](#), [Camp and Heath-Camp \(2015\)](#), and [Janků et al. \(2016\)](#) agree that sustainable development is very important a soil protection. Therefore, the general scientific community (e.g. [van Dijk & Kopeva, 2006](#); [Williams & Schirmer, 2012](#)) advises that rural areas should not be looked at only concerning their production capacity and potential, but also in terms of their other functions. This means that concepts such as rural protection/sustainability (and associated long-term land protection) and economic development should be complementary, not conflicting or competing.

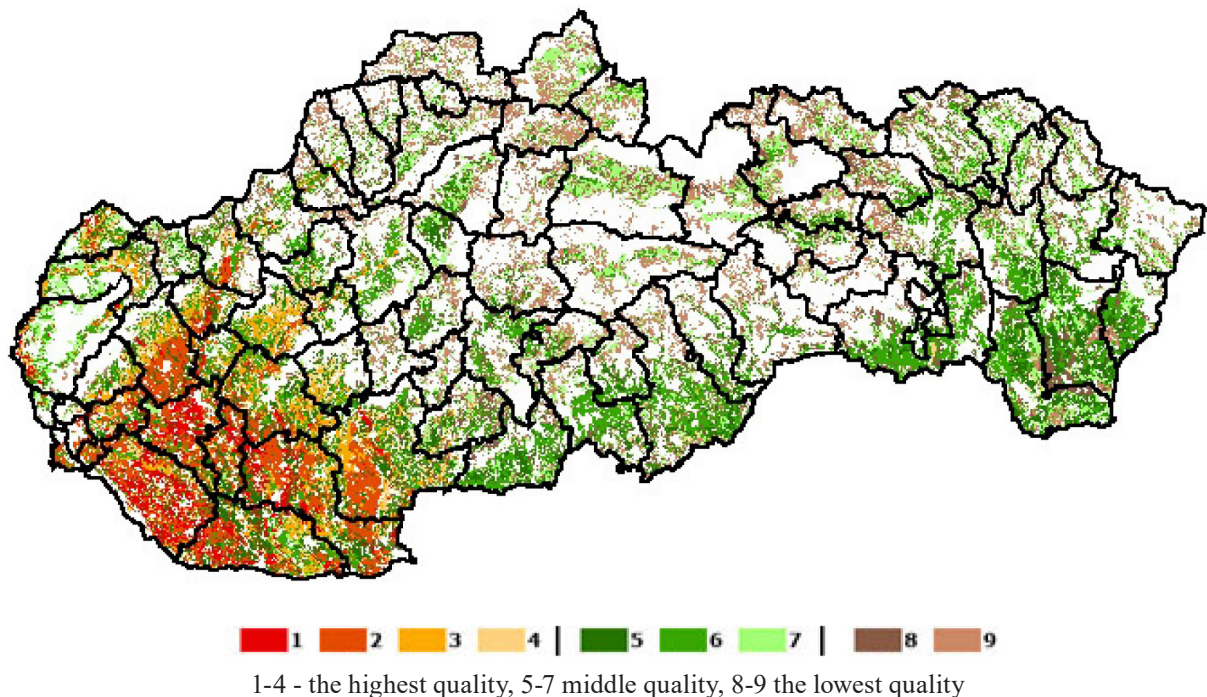
[He et al. \(2014\)](#) and [Palchoudhuri et al. \(2015\)](#) agree that agricultural soil is also a basic prerequisite for the economic growth and development of the territory, as almost all economic activities involve the use of soil in a certain context. According to [Szabo and Grznár \(2015\)](#), agriculture also fulfils the so-called environmental mission, as the management of natural resources, such as soil in particular, shapes and preserves landscape diversity.

There are many ways to measure the quality of agricultural soil. Several authors, such as [Džatko \(2002, in Vilček, 2011\)](#) and [Hraško, et al. \(2010, in Vilček, 2011\)](#) agree that the quality of agricultural land is most closely related to its productive capacity, which is expressed through the rating of agricultural soils. All agricultural soils are classified into 9 soil quality groups (Figure 2.) - the first 4 groups of soils are the highest quality and considered protected, thus they can be withdrawn and used for non-agricultural purposes only if there is no alternative solution ([Act No. 220/2004 Coll. Decree of the Ministry of Agriculture of the Slovak Republic No. 508/2004 Coll.](#)).

The quality of agricultural soil is affected by various problems resulting from the historical and economic development of the country: a) unsettled land ownership, b) extreme land fragmentation, c) a large area of agricultural land under state control, d) withdrawals for non-agricultural

purposes (Palšová et al., 2019). Based on initiatives related to raising awareness of the current situation and condition of agricultural land and its indicators, many important documents and programs valid for all EU member states were created, such as the European Green Agreement, Strategy for Soil 2030, etc.

The main aim of the paper was to analyse the current state of agricultural land and its development in the territory of the Slovak Republic, with a special emphasis on the investigation of agricultural land withdrawals for non-agricultural purposes.



**Figure 2.** Representation of agricultural soil within 9 quality groups in the Slovak Republic

Source: Research Institute of Soil Science and Soil Protection, 2019

## 2. METHODOLOGY

The primary source was information obtained through the Delphi method, which involved interviews with the Ministry of Agricultural and Rural Development of the Slovak Republic and databases of the Statistical Office of the Slovak Republic and Eurostat.

The objects of the investigation were agricultural soil and agricultural soil withdrawn. The agricultural land withdrawn was subsequently divided into 3 categories: Western, Central and Eastern Slovakia.

The investigation of the relationships between the purposes of the agricultural soil withdrawn and individual levels of its quality was carried out through multiple linear regression in the Excel program, where the dependent variable was the amount of agricultural soil withdrawn in ha for the individual purposes for which soil is most often withdrawn in Slovakia - specifically, housing purposes and industry. The independent, explanatory variables were the amount of agricultural soil withdrawn within the nine quality groups. From the point of view of the coefficient of determination, this method proved to be the most suitable for describing the dependence between monitored variables, for which the general formula applies:

$$y = b_0 + b_1 x_1 + b_2 x_2 + \dots + b_n x_n \quad (1)$$

Where:

- $b_0$  – intercept,
- $b_1 - b_n$  – regression coefficients,
- $y$  – value of the dependent variable,
- $x_1 - x_n$  – values of the independent variable.

Regression and correlation analysis consists of 3 parts:

### 2.1. Correlation Analysis

#### a) Multiple correlation coefficient (Multiple R)

The degree of dependence between the dependent variable and the independent variables is determined using the multiple correlation coefficient (Multiple R). Dependency can be as follows:

- Multiple R < 0.3 – low dependence between variables,
- $0.3 \leq \text{Multiple R} < 0.5$  – moderate dependence between variables,
- $0.5 \leq \text{Multiple R} < 0.7$  – significant dependence between variables,
- $0.7 \leq \text{Multiple R} < 0.9$  – high dependence between variables,
- $0.9 \leq \text{Multiple R}$  – very high dependence between variables.

#### b) Coefficient of determination (R Square)

#### c) Adjusted coefficient of determination (Adjust R Square)

### 2.2. ANOVA

Hypotheses:

**H0:** The multiple linear regression model is not statistically significant.

**H1:** The multiple linear regression model is statistically significant.

Significance  $F < \alpha$  (significance level 0.05) – we reject the null hypothesis.

Significance  $F > \alpha$  (significance level 0.05) – we accept the null hypothesis.

### 2.3. Regression Analysis

Hypotheses:

**H0:** Intercept and regression coefficients are statistically insignificant.

**H1:** Intercept and regression coefficients are statistically significant.

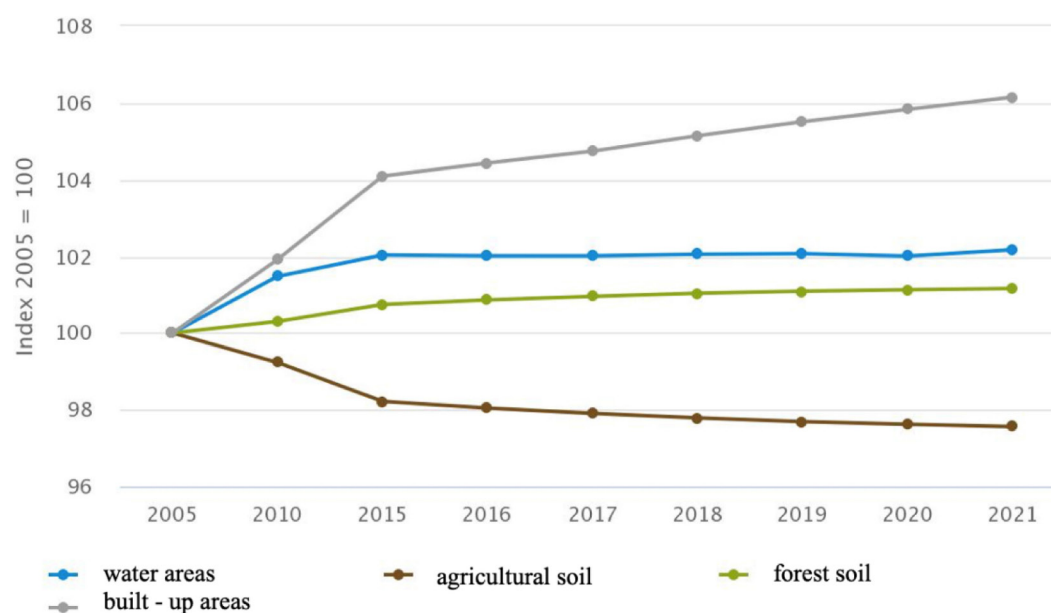
P-value <  $\alpha$  (significance level 0.05) – rejects the null hypothesis.

P-value >  $\alpha$  (significance level 0.05) – we accept the null hypothesis.

### 3. RESULTS

#### 3.1. Current State of Agricultural Soil in Slovakia

According to the latest available data (year 2022), the share of agricultural soil in the total area of the Slovak Republic was 48.4%. In the monitored period of 2005 - 2021, we note a decrease in the share of agricultural soil in favour of an increase in the area of forest soil (by 1.2%), water areas (2.2%) and built-up areas and courtyards (6.2%). According to the [Office of Geodesy, Cartography and Cadastre of the Slovak Republic \(2021\)](#), the average area of agricultural land per inhabitant was 0.265 ha in 2005 and 0.257 ha in 2021 (a decrease of 3%) (Figure 3.).



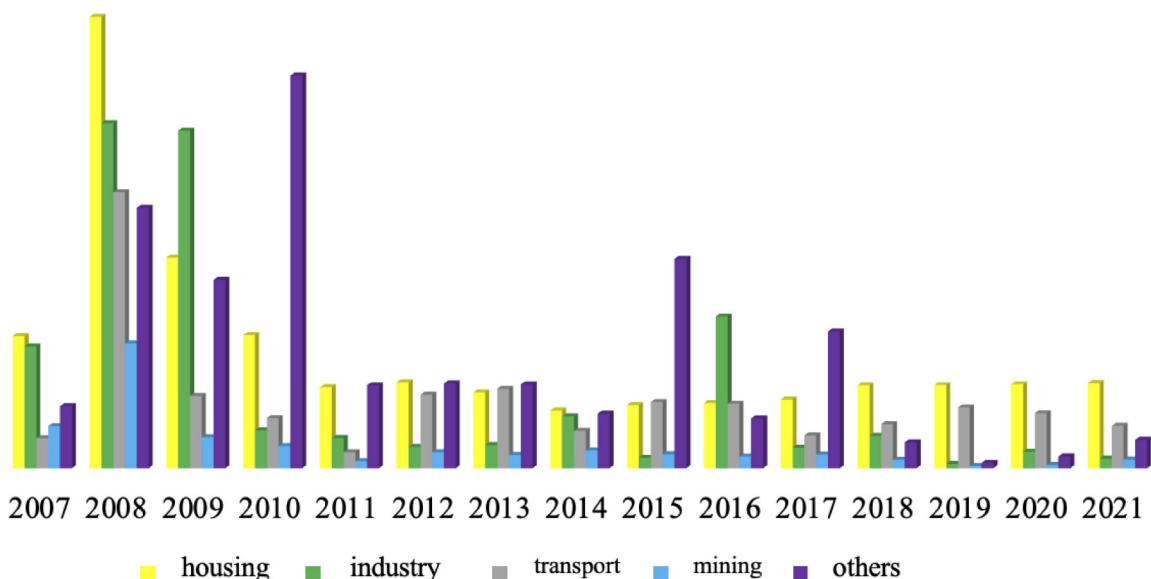
**Figure 3.** Percentage development of changes in soil use on the territory of Slovakia in the period 2005-2021

**Source:** Own processing

according to the [Office of Geodesy, Cartography and Cadastre of the Slovak Republic, 2021](#)

As a result of the mentioned facts, it is possible to identify constant agricultural soil withdrawals on the territory of the Slovak Republic. The phenomenon of agricultural soil withdrawals for non-agricultural purposes continues and during the monitored period of 15 years, a total of 16,717.51 ha of agricultural soil was withdrawn from the land fund, which represents 0.70% of the total area of agricultural soil. The most common purpose for agricultural soil withdrawals during all monitored years was housing (37% of the total volume of withdrawals land) and industry (25% of the total volume of withdrawals land). The highest value of agricultural soil withdrawals for these purposes can be observed in 2008 and 2009, when there were legislative changes regarding the payment of levies for withdrawals ([directed interview with experts on agricultural land protection from the Ministry of Agriculture and Rural Development of the Slovak Republic](#)). An exception to the otherwise even trend in the development of soil withdrawn by individual purpose is 2010, when a significantly high amount of soil was withdrawn for purposes designated as other, namely 1324.5400 ha. This is due to the fact that in 2010 the state started to support the construction of photovoltaic power plants that fall into this category through subsidies (Figure 4.) Most of the agricultural soil withdrawn (namely 5,739.607 ha, 32.17% of the total amount of soil withdrawn) belonged to group 6, which represents middle

quality. Most soil was withdrawn in 2008, as this was the last year without levy obligation. The most frequently withdrawn soils were also in quality groups 5 (13.76%), 7 (13.44%), 2 (11.93%) and 4 (6.53%), i.e. middle to high-quality soils. Conversely, the least amount of agricultural soil was withdrawn within quality group 1 (5.14%).



**Figure 4.** Development of agricultural soil withdrawals for specific non-agricultural purposes in ha on the territory of Slovakia in the period 2007-2021

**Source:** Own processing according to the [Ministry of Agriculture and Rural Development of the Slovak Republic](#)

### 3.2. Regression and Correlation Analysis

Table 1 shows the results of regression and correlation analysis evaluating the impact of agricultural soil withdrawn within all nine groups of its quality for housing purposes in Western, Central and Eastern Slovakia.

**Table 1.** Impact of the amount of agricultural soil withdrawn in quality groups for housing purposes in 2021

Western Slovakia		Central Slovakia		Eastern Slovakia	
SUMMARY OUTPUT		SUMMARY OUTPUT		SUMMARY OUTPUT	
<i>Regression Statistics</i>		<i>Regression Statistics</i>		<i>Regression Statistics</i>	
Multiple R	0,999079996	Multiple R	0,99650383	Multiple R	0,989751728
R Square	0,998160838	R Square	0,993019884	R Square	0,979608482
Adjusted R Square	0,994850345	Adjusted R Square	0,96160936	Adjusted R Square	0,933727568
Standard Error	0,863172904	Standard Error	0,998382264	Standard Error	1,002424749
Observations	15	Observations	12	Observations	14

**Source:** Own processing

The output of the regression and correlation analysis consists of three parts. The first part is correlation analysis, which was used to test the strength of the dependence between observed variables. The multiple correlation coefficient (Multiple R) takes on a value of 0.9991 for Western Slovakia, 0.9965 for Central Slovakia and 0.9898 for Eastern Slovakia - this indicates a very high dependence between the amount of agricultural soil withdrawn in quality groups 1-9

(independent variables) and the amount of agricultural soil withdrawn for housing purpose (dependent variable). The coefficient of determination (R Square) informs that the chosen model explains the variability of the amount of agricultural soil withdrawn for housing purposes to approximately 99.82% for Western Slovakia, 99.30% for Central Slovakia and 97.96% for Eastern Slovakia - the remaining part is unexplained variability of the influence of random and other factors. The adjusted coefficient of determination (Adjusted R Square) explains that approximately 99.49% within Western Slovakia, 96.16% within Central Slovakia, and 93.37% within Eastern Slovakia of the variation in the amount of agricultural soil for monitored purposes is collectively explained by all independent variables, namely the amount of agricultural soil withdrawn in quality groups 1-9.

The main role of the second part of the output was to test the suitability of the selected model. The null hypothesis was tested ( $H_0$ ), according to which the chosen multiple linear regression model is not suitable - statistically significant (alternative hypothesis  $H_1$  is opposite). The F test is used to evaluate the statement, i.e. the comparison of the Significance F value with the alpha significance level: a) Western Slovakia: 2.68946E-06 (Significance F) < 0.05 (alpha), b) Central Slovakia: 0.031029064 (Significance F) < 0.05 (alpha), c) Eastern Slovakia: 0.0049 (Significance F) < 0.05 (alpha), as a result, the null hypothesis was rejected and accept the alternative hypothesis - multiple linear regression model was chosen correctly.

The last part of the output consists of a regression analysis, examining the relationship between the observed variables. Based on this were formulated regression functions in the following form:

Western Slovakia:

$$y = 0.13 - 0.76 x_1 + 1.50 x_2 + 0.50 x_3 + 0.15 x_4 + 0.47 x_5 + 1.05 x_6 + 0.01 x_7 + 0.61 x_8 + 1.04 x_9$$

Central Slovakia:

$$y = -0.40 - 0.55 x_4 - 0.13 x_5 + 0.64 x_6 + 0.52 x_7 + 0.54 x_8 + 1.80 x_9$$

Eastern Slovakia

$$y = 0.63 - 21.84 x_4 - 0.03 x_5 + 0.49 x_6 + 0.20 x_7 + 2.04 x_8 + 0.29 x_9$$

The value of the intercept expresses that with zero values of the amount of agricultural soil withdrawn in quality groups 1-9, the value of the amount of agricultural soil withdrawn for housing purposes would be 0.13 ha for Western Slovakia, -0.40 ha for Central Slovakia and 0.63 ha for Eastern Slovakia. The most significant values for Western Slovakia indicate that if the amount of agricultural soil withdrawn in group 2 increases by 1 ha (assuming that other variables remain unchanged), then the amount of agricultural soil withdrawn for housing purposes increases by 1.50 ha, in group 6 by 1.04 ha and in group 8 0.61 ha. For Central Slovakia, if the amount of agricultural soil withdrawn in Group 9 increases by 1 ha, then the amount of agricultural soil withdrawn for housing purposes increases by 1.80 ha and in Eastern Slovakia in Group 6 by 0.49 ha.

Also, in this part, the null hypotheses regarding the intercept and regression coefficients were tested. The null hypothesis states that the coefficient is statistically insignificant, and the alternative hypothesis states the opposite. P-value was compared with the alpha significance level (significance level 0.05). With the intercept, it can be seen that its P-value is higher than alpha, which means that the intercept is statistically insignificant in all three parts of Slovakia. The

P-value for the regression coefficients of the amount of agricultural soil withdrawn in quality groups is lower than alpha in Western Slovakia for 2.,6.,8. quality groups, in Central Slovakia for 9. quality group and in Eastern Slovakia for 6. quality group thereby confirming the statistical significance of these coefficients by rejecting the null hypothesis.

Table 2 shows the results of regression and correlation analysis evaluating the impact of agricultural soil withdrawn within all nine groups of its quality for industry purposes in Western, Central and Eastern Slovakia.

**Table 2.** Impact of the amount of agricultural soil withdrawn in quality groups for industry purposes in 2021

Western Slovakia		Central Slovakia		Eastern Slovakia	
SUMMARY OUTPUT		SUMMARY OUTPUT		SUMMARY OUTPUT	
<i>Regression Statistics</i>		<i>Regression Statistics</i>		<i>Regression Statistics</i>	
Multiple R	0,949169285	Multiple R	0,998466004	Multiple R	0,951383947
R Square	0,900922331	R Square	0,996934362	R Square	0,905131414
Adjusted R Square	0,722582526	Adjusted R Square	0,983138991	Adjusted R Square	0,691677096
Standard Error	0,612201929	Standard Error	0,128200568	Standard Error	0,955552304
Observations	15	Observations	12	Observations	14

**Source:** Own processing

In the ANOVA output section, we tested the null hypothesis that the chosen is not appropriate (statistically significant) by comparing the Significance F value with the alpha significance level: a) Western Slovakia: 0,044613868 (Significance F) < 0,05 (alfa), b) Central Slovakia: 0,013721549 (Significance F) < 0,05 (alfa), c) Eastern Slovakia: 0,088831834 (Significance F) > 0,05 (alfa), as a result, we can reject the null hypothesis and accept the alternative hypothesis, which means that the multiple linear regression model was chosen correctly for Western Slovakia and Central Slovakia. The multiple correlation coefficient (Multiple R) for both parts of Slovakia acquire values greater than 0.9, which indicates a very high dependence between the amount of agricultural soil withdrawn in quality groups 1-9 (independent variables) and the amount of agricultural land withdrawn for industrial purposes (dependent variable).

The adjusted coefficient of determination (Adjusted R Square) explains that approximately 72.26 % within Western Slovakia and 98.31 % within Central Slovakia of the variation in the amount of agricultural soil for monitored purposes is collectively explained by all independent variables, namely the amount of agricultural soil withdrawn in quality groups 1-9. The intercept value expresses that with zero values of the amount of agricultural land withdrawn in quality groups 1-9, the value of the amount of agricultural land withdrawn for industrial purposes would be - 0.29 ha for Western Slovakia and 0.01 ha for Central Slovakia. The most significant values for Western Slovakia indicate that if the amount of soil withdrawn in group 5 increases by 1 ha, assuming that other variables remain unchanged, then the amount of soil withdrawn for industry will decrease by 0.60 ha and in group 7 by 0.40 ha. For Central Slovakia, if the amount of soil withdrawn in group 5 increases by 1 ha, assuming that other variables remain unchanged, then the amount of land withdrawn for industry will increase by 0.06 ha. The P-value for the regression coefficients of the amount of agricultural land withdrawn in the quality groups is lower than alpha (significance level 0.05) in Western Slovakia for the 5<sup>th</sup> and 7<sup>th</sup> quality groups and in Central Slovakia for the coefficients of the 5<sup>th</sup> quality group, which confirms the statistical significance of these coefficients by rejecting the null hypothesis.



## 4. CONCLUSION

The results show that agricultural soil in the Slovak Republic has continuously decreased over the years in favour of built-up areas, forest soil and water areas. It is most often withdrawn for housing and industry purposes in connection with the necessary economic development of the country, especially in the western part of Slovakia, where the best quality land is also located. This was also confirmed by the results of the multiple linear regression, which showed a statistically significant influence between the purpose (housing and industry) and several groups of the quality of the withdrawn soil. These results show a significant impact of the agricultural soil withdrawn for housing purposes in the area of Western Slovakia, where the highest quality soil is found to the greatest extent and there is the most concentrated construction activity. When designing and implementing a national strategy for the protection of agricultural land, it is extremely necessary to distinguish, among other things, the assumptions and predispositions of individual locations and territories. In conclusion, the authors therefore point to the proposal of systematic measures for the protection of agricultural soil in Slovakia:

- enforce the use of alternative land in the event of the threat of soil withdrawn of the highest quality,
- cancellation/revaluation of exemptions from the payment of levies for the withdrawal of agricultural soil,
- increase in the number of levies for agricultural land withdrawn,
- establishment of the fund for the protection of agricultural soil,
- implement appropriate legislative and economic motivational tools in connection with the emphasis on reclamation projects in the area of agricultural soil protection,
- personnel strengthening of the relevant control bodies in the field of agricultural land protection,
- raising awareness/education about individual problems in the area of agricultural soil protection and their solution options.

The authors propose to strengthen the importance of research and educational projects or international cooperation in the field of agricultural soil protection and through appropriate communication or motivational channels to raise the awareness of the scientific community and other experts in this area about the need for research in this area.

## Acknowledgment

The paper was prepared within the project “Quality Soil as a Pathway to Healthy Food in the EU” Erasmus+ Programme - Jean Monnet Activities 621119-EPP-1-2020-1-SK-EPPJMO-PROJECT Decision number: 621119.

## References

- Act no. 220/2004 Coll. on the protection and use of agricultural land and amending Act no. 245/2003 Coll. on integrated pollution prevention and control and amending certain laws, as amended.
- Ahmad, N. S. B., Mustafa, F. B., Muhammad Yusoff, S. Y., & Didams, G. (2020). A systematic review of soil erosion control practices on the agricultural land in Asia. *International Soil and Water Conservation Research*, 8(2), 103-115. <https://doi.org/10.1016/j.iswcr.2020.04.001>

- Camp, W. G., & Heath-Camp, B. (2015). *Managing our natural resources*. Cengage Learning. ISBN 978-1-285-83507-5.
- Edwards, C. A., et al. (2012). *Agriculture and the Environment*. Amsterdam: Elsevier Science Publishers. ISBN 0-444-89800-X.
- Efe, R., & Ozturk, M. (2014). *Environment and Ecology in the Mediterranean Region II*. Newcastle upon Tyne: Cambridge Scholars Publishing. ISBN 978-1-4438-5538-9.
- Fazal, S. (2013). *Land Use Dynamics in a Developing Economy*. SpringerBrief in Geography. ISSN 2211-4173. DOI: 10.1007/978-94-007-5255-9\_6.
- FAO (Food and Agriculture Organization of the United Nations). (2019). *Investment Centre Annual Review 2019*. Roma, Italy: Food and Agriculture Organization of The United Nations. Retrieved from <http://www.fao.org/documents/card/en/c/cb0464en>
- He, C., et al. (2014). Land use change and economic growth in urban China: A structural equation analysis. *Urban Studies*, 51, 2880-2898. Retrieved from <https://journals.sagepub.com/doi/abs/10.1177/0042098013513649>
- Hou, D., et al. (2020). Metal contamination and bioremediation of agricultural soils for food safety and sustainability. *Nat Rev Earth Environ*, 1, 366–381. <https://doi.org/10.1038/s43017-020-0061-y>
- Hraško, J. (2017). Hodnota pôdy. In *Pôda je národné bohatstvo i záruka štátnosti*. Martin: Vydavateľstvo Matice slovenskej. ISBN 978-80-8128-190-7.
- Janků, J., et al. (2016). Estimation of Land Loss in the Czech Republic in the Near Future. *Soil & Water Research*, 11, 1-8. Retrieved from [https://www.agriculturejournals.cz/public-Files/40\\_2016-SWR.pdf](https://www.agriculturejournals.cz/public-Files/40_2016-SWR.pdf)
- Karis, A., & Jettou, D. (2013). *Land Use and Land Management Practices in Environmental Perspective. Morocco: INTOSAI WGEA*. ISBN 978-9949-9061-9-2.
- Karlsson, I., & Rydén, L. (2012). *Rural Development and Land Use*. Uppsala: Baltic University Press. ISBN 978-91-86189-11-2.
- Kefeli, V., & Blum, W. E. H. (2010). *Mechanisms of Landscape Rehabilitation and Sustainability*. Belgium: Bentham Science Publishers. ISBN 978-1-60805-168-7.
- Margottini, C. (2013). On the Protection of Cultural Heritages from Landslides. In *Landslide Science and Practice*. Berlin: Springer. ISBN 978-3-642-31318-9.
- Ministry of Agriculture and Rural Development of the Slovak Republic.
- Ministry of Agriculture of the Slovak Republic. (2004). Decree no. 508/2004 Coll., implementing § 27 of Act no. 220/2004 Coll. on the protection and use of agricultural land and on the amendment of Act no. 245/2003 Coll. on integrated prevention and control of environmental pollution and on amendments to certain laws as amended.
- Nedd, R., et al. (2021). A Synthesis of Land Use/Land Cover Studies: Definitions, Classification Systems, Meta-Studies, Challenges and Knowledge Gaps on a Global Landscape. *Land*, 10(9), 994. MDPI AG. Retrieved from <http://dx.doi.org/10.3390/land10090994>
- Office of Geodesy, Cartography and Cadastre of the Slovak Republic. (2021). *Statistical Yearbook on Soil Fund k 1*. January 2021. Retrieved from <http://www.skgeodesy.sk/files/slovensky/ugkk/kataster-nehnutelnosti/sumarne-udaje-katastra-podnom-fonde/statisticka-rocenka-2020.pdf>
- Palchoudhuri, Y., et al. (2015). A New Socio–economic Index for Modelling Land Use and Land Cover Change: A Case Study in Narmada River Basin, India. *Journal of Land and Rural Studies*, 3.1, 1-28. Retrieved from <https://journals.sagepub.com/doi/abs/10.1177/2321024914534051>
- Palšová, L., et al. (2019). Modelling development, territorial and legislative factors impacting the changes in use of agricultural land in Slovakia. *Sustainability*. Retrieved from <https://www.mdpi.com/2071-1050/11/14/3893/htm>

- Pašakarnis, G., et al. (2013). Rural development and challenges establishing sustainable land use in Eastern European countries. *Land Use Policy*, 30.1, 703-710. Retrieved from <https://www.sciencedirect.com/science/article/pii/S026483771200097X>
- Research Institute of Soil Science and Soil Protection. (2019).
- Robins, C. (2016). Soils, Science, Society and the Environment. *Oxford Research Encyclopedia of Environmental Science*, 1-37. DOI: 10.1093/acrefore/9780199389414.013.69.
- Szwarcz, P., et al. (2013). Selected issues of the agricultural land market in the Slovak Republic. *Journal of Central European Agriculture*. [online]
- Szabo, Ľ., & Grznár, M. (2015). Pracovné sily a výkonnosť poľnohospodárstva v SR. *Ekonomika poľnohospodárstva*, 15(3), 4-13. ISSN 1338-6336.
- Tóth, G., et al. (2008). Threats to Soil Quality in Europe. Luxembourg: Office for Official Publications of the European Communities. ISBN 978-92-79-09529-0.
- van Dijk, T., & Kopeva, D. (2006). Land banking and Central Europe: future relevance, current initiatives, Western European past experience. *Land Use Policy*, 23(3), 286-301. Retrieved from <https://www.sciencedirect.com/science/article/pii/S026483770400081X>
- Viana, C. M., et al. (2022). Agricultural land systems importance for supporting food security and sustainable development goals: A systematic review. *Science of The Total Environment*, 806(Part 3). ISSN 0048-9697. <https://doi.org/10.1016/j.scitotenv.2021.150718>
- Vilček, J. (2011). Potenciály a parametre kvality poľnohospodárskych pôd Slovenska. *Geografický časopis*, 63.2, 133-154. Retrieved from <https://www.sav.sk/journals/uploads/03101342Vil%C4%8Dek.pdf>
- Williams, K. J. H., & Schirmer, J. (2012). Understanding the relationship between social change and its impacts: The experience of rural land use change in south-eastern Australia. *Journal of Rural Studies*, 28, 538-548. Retrieved from <https://www.sciencedirect.com/science/article/pii/S0743016712000526>





# Climate Change Impact on Agricultural Production

Slave Camelia<sup>1</sup> 

Man Carmen Mihaela<sup>2</sup> 

Received: August 25, 2023

Accepted: November 6, 2023

Published: March 16, 2024

## Keywords:

Climate changes;

Crops;

European Union;

Production;

Surfaces



Creative Commons Non Commercial CC BY-NC: This article is distributed under the terms of the Creative Commons Attribution-Non-Commercial 4.0 License (<https://creativecommons.org/licenses/by-nc/4.0/>) which permits non-commercial use, reproduction and distribution of the work without further permission.

**Abstract:** *The purpose of this study is to provide a model with the help of GIS technology to monitor the negative consequences of climate change that occur in Dolj County as a consequence of the aridification phenomenon. The two crops are also presented with the areas occupied by them and the productions obtained over 8 years. The CLC map of the study area provides data on surface occupation. The information can be used to invest in the county's agriculture.*

*An inventory can be made of areas affected by climate change, subjected to significant investments through the planting of protective acacia curtains and irrigation. Surface and production data are available for free download from the National Institute of Statistics for the period 2015-2022.*

## 1. INTRODUCTION

The member states of the European Union have signed and ratified the Paris Agreement. Thus, the European Union commits itself to become the first climate-neutral economy and society by 2025. This represents a long-term environmental protection policy, the European Union undertakes to reduce emissions by at least 55% compared to 1990, by 2030.

In June 2021, the Council of the European Union adopted the European Climate Law, which is part of the European Green Pact. From a legal point of view, the member countries are obliged to achieve their climate objectives for the year 2030, as well as those up to the year 2050.

Romania, as a member of the United Nations, agrees that climate change and the consequences arising from it represent a cause for concern for all nations. Through its activities, industry has increased the concentration of greenhouse gases. This increase in the greenhouse effect will determine in the coming years the increase in the temperature of the earth's surface and the consequences that will be borne by natural ecosystems.

According to the Charter of the United Nations and the principles of international law, countries have their environmental legislation, but they are obliged not to harm the environment of other countries or regions that are not under their national jurisdiction. This reaffirms the principle of state sovereignty, this principle is the basis of international cooperation that is subject to climate change (Ministry of Environment, Waters and Forests, n.d.).

<sup>1</sup> University of Agronomic Sciences and Veterinary Medicine of Bucharest, 59 Mărăști Blvd, Bucharest, Romania

<sup>2</sup> University of Agronomic Sciences and Veterinary Medicine of Bucharest, 59 Mărăști Blvd, Bucharest, Romania

The UNFCCC (United Nations Framework Convention on Climate Change) objectives established in 1992 are achieving stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic disruption of the climate system; this level will have to be reached in a sufficient time interval, which would allow ecosystems to naturally adapt to climate change so that food production is not threatened. and economic development sustainably takes place.

Within the objectives of the European Ecological Pact, environmental policies and climate change represent the most important political goals. The European Green Deal was published on December 11, 2019, within the European Commission, for environmental protection and climate change policy guidelines. The emblematic objective of the European Green Deal is to transform Europe into the first climate-neutral continent. The document represents a road map leading to the achievement of this objective.

The priorities of the European Green Deal are zero pollution, sustainable management of chemicals, water management, biodiversity, air quality, and better implementation of environmental legislation. In line with the approach presented within the European Green Deal, the European Commission has already presented a series of key documents, one of them being

the new EU Strategy regarding adaptation to climate change and its effects. This strategy defines also the directions that must be followed to face their challenges. And encourages state members to continue progress to boost adaptive capacity, strengthen resilience, and reduce vulnerability to climate change (Ministry of Environment, Waters and Forests, n.d.).

In the last period, a warming of Europe's climate by 1 degree Celsius was observed, this increase is higher than the world average. Due to this increase in southern Europe, periods of drought have become more and more frequent. The extreme temperatures recorded that exceeded any record are a consequence of the climate changes caused by humans.

Romania has a well-defined legislative framework concerning European environmental policies regarding climate change

- Law no. 24/1994 on the ratification of the United Nations Framework Convention on Climate Change, signed at Rio de Janeiro on 5 June 1992;
- Law no. 3/2001 for the ratification of the Kyoto Protocol to the Framework Convention of the United Nations Convention on Climate Change, adopted on 11 December 1997 (Yilmaz, 2010).

## 2. MATERIAL AND METHODS

### 2.1. Study Area

Dolj County covers an area of 7414 km<sup>2</sup>, 3.1% of the Romanian territory, and is the 7<sup>th</sup> largest county in the country. The Danube River crosses the southern part of the county for a distance of 150 km, also forming the border with Bulgaria. Dolj County is located in the south-southwest area of Romania and stretches between 44°00' and 44°30' north latitude and 22°00' and 23°00' east longitude.

According to the data provided by the National Institute of Meteorology and Hydrology. Dolj County is considered the most arid area in Romania and the only European desert (Achim et al., 2012).

Over 100.000 hectares are being aridization, an area known as the "Oltenia Sahara" - a triangle, on the map, between Craiova, Calafat and Corabia. spread over 6% of the surface. And the specialists say that the dunes advance every year by a thousand hectares. The main cause of this rare phenomenon of desertification is the deforestation of the forest curtains, which stop the effects of aridity. But if in 1970 forests covered 12% of the surface of Dolj county, now they occupy only 7%, and the area is decreasing.

The thermal values for the period 1901-2013 were analyzed at 17 meteorological stations with a consecutive string of measurements for over 100 years. The analysis shows that, in Romania, the average annual air temperature has increased in the last 36 years by 0.50 0C compared to the entire analyzed period. The analysis of precipitation shows that, from a pluviometric point of view, there is a trend of decreasing annual amounts of precipitation in the period 1981-2013 compared to the period 1901-1980. In the Oltenia region, the decrease in the average amount of precipitation is evident for the period 1981-2013 (642.0 mm/year), compared to the reference period 1961-1980 (673.4 mm/year) (National Meteorological Administration, n.d.).

How local resources are managed is very important, because the problems of climate change can be amplified and the effect of global warming can be limited. The latest report of the study on climate change highlights that in Romania we will have arid areas that will become even more arid, and those that already have precipitation will have even more precipitation.

From the series of meteorological observations the area most affected by the hydrological drought in Romania in the last decades of the XX century and the beginning of the XXI century, was the south of the country, with excessive aspects for the Oltenia region (National Meteorological Administration, n.d.).

According to the data provided by the National Statistics Institute, agriculture is the second branch of the economy of Dolj County (after industry), with old traditions, within which, after 1991, the private sector developed through the transfer of land from the state property to the property of the former owners. At the end of 2007, agricultural area of Dolj county was 585.223 ha (2<sup>nd</sup> place in the country after Timiș county), of which 488.866 ha were arable land (2<sup>nd</sup> place in the country), 69.275 ha natural pastures, 2.952 ha natural hayfields, 16.841 ha vineyards and wine nurseries (3<sup>rd</sup> place in the country after Vrancea and Galati county) and 7.289 ha of orchards and fruit nurseries.

Dolj County is facing a phenomenon that is hard to control: the south part has a water deficit and is affected by drought. Dolj County ranks first in the country in terms of the percentage of land with a sandy or loamy-sandy texture, with desertification accents.

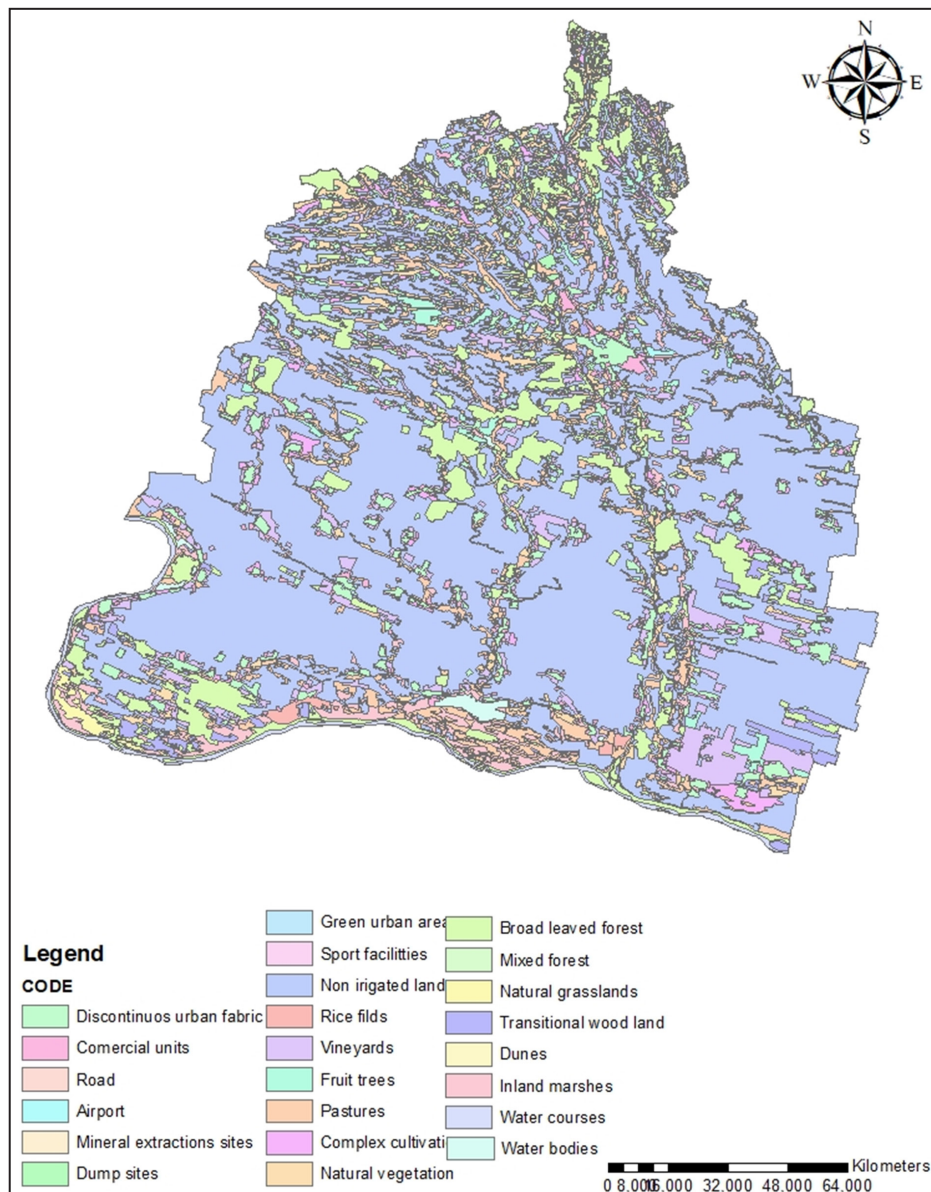
Agriculture is a strongly developed economic branch at the level of Dolj County, standing out for its cereal crops. The development of agriculture was favored by tradition, favorable climate, and fertile soils. However, the agricultural potential of the county is not exploited, the strong fragmentation of the lands, the lack of high-performance equipment, and the lack of support and training of the staff from agriculture have led to the practice of subsistence agriculture, which is unprofitable from the economic point of view. The lack of a broad agricultural system at the county level and the lack of centers for the collection and processing of agricultural products make it impossible for farmers to capitalize on both production at more favorable prices and the real agricultural potential of Dolj County.

Figure 1 shows the Corine Land Cover map of the studied area. This map provides information on how the lands are used. The map was created with the ArcGIS 10.6.1 Program.

Environment Coordination Information (CORINE LAND COVER) is an inventory of land use in Europe, divided into 44 different land use classes. CLC also shows class changes over four periods, starting in 1990. Both land use and changes are mapped at high resolution. The CLC database is made in cooperation with European countries. (Figure 1) (Yilmaz, 2010).

The CORINE LAND COVER program was created by the European Commission to have a Geographical Information System regarding land use in the European Union.

CORINE LAND COVER 2000 (CLC) is a spatial database obtained by photo-interpretation of images provided by Landsat ETM+. Spatial data is being used in the monitoring and evolution of the urban and rural geographical space (Geo-spatial.org., n.d.; Copernicus Land Monitoring Service, n.d.; Open Geospatial Consortium, n.d.).



**Figure 1.** The CORINE LAND COVER map of Dolj County



## 2.2. Cornfield

From the center of origin, Mexico, Central America, and South America, the corn culture, due to the ecological plasticity of the hybrids created, is cultivated around the globe in the most varied climate and soil conditions. In Romania, corn kernels are cultivated on approximately 3.0 -3.5 million ha and 70% of this surface is in the south of the country.

Table 1 and Table 2 show the amount of cereals obtained per ha within the two important crops in Dolj County and the areas occupied by each of these crops.

The studied period is for 8 years. For corn kernels, the largest amount harvested was in 2018, and for sunflower in 2019. The lowest quantities for the two crops are in 2022 and 2015 respectively.

**Table 1.** Average production per hectare, for the main crops

The main crops	Forms of ownership	Year							
		2015	2016	2017	2018	2019	2020	2021	2022
		Kg/ ha							
		Kg	Kg	Kg	Kg	Kg	Kg	Kg	Kg
Corn kernels	Total	3471	4025	6856	7779	6332	4806	4485	3914
-	Private sector	3467	4027	6862	7794	6333	4799	4485	3917
-	Individual farms	2977	3681	7197	7220	5683	3423	3539	3334
Sunflower	Total	1659	1697	3027	2765	2946	2045	2831	2039
-	Private sector	1661	1693	3036	2773	2947	2042	2836	2039
-	Individual farms	1558	1435	3757	2902	3363	1472	3361	1925

Source: National Institute of Statistics, n.d.

**Table 2.** Cultivated area with corn kernels and sunflowers, between 2015 /2022 by ownership forms

The main crops	Ownership forms	Year							
		2015	2016	2017	2018	2019	2020	2021	2022
		UM: Ha							
		Ha	Ha	Ha	Ha	Ha	Ha	Ha	Ha
Corn kernels	Total	94208	98409	85294	85006	97165	88872	83335	75754
-	Private sector	93794	97985	85060	84654	97018	88403	83322	75472
-	Individual farms	73696	75091	64902	65384	65963	54855	51832	51839
Sunflower	Total	67560	91007	77329	74132	112769	89937	93151	101297
-	Private sector	66833	90220	76476	73420	112264	89633	91720	99819
-	Individual farms	34300	52490	37937	38124	59453	38453	49195	49332

Source: National Institute of Statistics, n.d.

From the analysis of the data provided by the National Institute of Statistics, it is found that the corn kernels were cultivated in 2022 in an area of 75754 ha compared to 2015 with 94208 ha. In the corn species, a decrease in the cultivated surface is noted. However, agricultural producers are cautious regarding this species, due to the meteorological conditions characterized by low precipitation in recent years and the lack of irrigation systems in certain areas.

The area cultivated with sunflower has positive increases because this species is in demand and very well paid on the market. The area cultivated with sunflowers in 2021 is 93151 ha less compared to 2020. This is because the species needs a rotation of at least 5 years to comply with the conditions of good agricultural practices for the practice of sustainable agriculture against the background of the lack of precipitation recorded in recent years.

### 3. CONCLUSION

1. In Dolj County, the sandy soils represent more than 100,000 hectares, and every year the area undergoing desertification increases by more than 1,000 hectares, a phenomenon due to climate changes and the increase in air temperature. Romania is one of the European Union states most affected by desertification.
2. Dolj County ranks third in the ranking of irrigated areas in Romania, the irrigated area is 70,000 hectares. It is planned that a much larger area will be irrigated in the future.
3. In Dolj County, the main crops are grain corn and sunflower. The area cultivated with grain corn in 2022 was the smallest in the last 8 years. Sunflower had the largest cultivated area in 2022.
4. By applying the irrigation law, in Dolj County, and legislative provisions related to this field, the aspects concerning the transfer of the management of irrigation activities were also addressed.

### References

- Achim, E., Manea, G., Vijulie, I., Cocos, O., & Tărlă, L. (2012). Ecological reconstruction of the plain areas prone to climate aridity through forest protection belts: Case study: Dăbuleni town, Oltenia Plain, Romania. *Procedia Environmental Sciences*, 14, 154–163.
- Copernicus Land Monitoring Service. (n.d.). CORINE Land Cover 2000. Retrieved from <https://land.copernicus.eu/pan-european/corine-land-cover/clc-2000>
- Geo-spatial.org. (n.d.). Retrieved from <http://www.geo-spatial.org>
- Ministry of Environment, Water and Forests. (n.d.). Schimbari Climatice [Climate Changes]. Retrieved from <http://www.mmediu.ro/categorie/schimbari-climatice/1>
- National Institute of Statistics. (n.d.). Romania's Statistical Yearbook, 2015-2022. Retrieved from <http://www.insse.ro/cms/>
- National Meteorological Administration. (n.d.). <https://www.meteoromania.ro/>
- Open Geospatial Consortium. (n.d.). Retrieved from <http://www.opengis.org>
- Yilmaz, R. (2010). Monitoring land use/land cover changes using CORINE land cover: A case study of Silivri coastal zone in metropolitan Istanbul. *Environmental Monitoring and Assessment*, 165, 603–615.



# Climate Change Impact on Financial Reporting – A Theoretical Approach

Almina Manoku<sup>1</sup> 

Received: August 29, 2023

Revised: November 28, 2023

Accepted: January 10, 2024

Published: March 16, 2024

## Keywords:

Climate change;  
Financial Reporting  
Standards;  
Non financial information



Creative Commons Non Commercial CC BY-NC: This article is distributed under the terms of the Creative Commons Attribution-Non-Commercial 4.0 License (<https://creativecommons.org/licenses/by-nc/4.0/>) which permits non-commercial use, reproduction and distribution of the work without further permission.

**Abstract:** *Climate change has a dual effect on the financial dimension of companies: on one hand companies spend more to meet the requirements of climate impact and meeting climate targets and on the other hand the climate regulations have increased the burden of financial regulation and financial reporting. This paper aims to discuss the theoretical approach that has been suggested in the literature to tackle the increased burden of disclosing financial information related to climate change. The paper discusses the main Climate-Related Risks, Opportunities, and Financial Impacts and what the preparers of financial statements have to keep in mind while publishing financial and non-financial information. Based on thorough research of recent theoretical and empirical publications the author finds that the most impacted financial reporting standards are standards on financial instruments, standards on Insurance Contracts on items such as asset impairment, changes in the useful life of assets, changes in the fair valuation of assets due to climate-related and emerging risks, increased costs and/or reduced demand for products and services, potential provisions and contingent liabilities arising from fines and penalties; and changes in expected credit losses for loans and other financial assets. As the requirement to disclose more financial and non-financial information related to climate impact is expected to increase in the future, the author concludes with several recommendations that will very soon be relevant for big and medium companies.*

## 1. INTRODUCTION

The global shift towards sustainable development economies and the mitigation of climate change are paramount challenges faced worldwide. Recently, there has been a surge in initiatives aimed at fostering sustainable development across both public and private sectors, including in the financial markets. This surge mirrors an increasing awareness of the substantial potential economic and financial repercussions of climate change, as well as risks related to environmental, social, and governance (ESG) factors. Certain jurisdictions are actively implementing policy or regulatory measures to bolster the role of the financial system in the shift towards sustainable development. From the perspective of growth and emerging markets, sustainable finance is deemed pivotal in the evolution of sustainable capital markets, thereby propelling sustainable growth and innovation.

Sustainable finance essentially examines the interplay between finance (investment and lending) and economic, social, and environmental dimensions. It essentially entails the integration of ESG factors into financial decision-making processes. There is no one-size-fits-all approach to ESG components across various stakeholders, resulting in divergent disclosure approaches for each component across different industries and nations. Given these discrepancies, ESG factors have surfaced as a pivotal trend in the financial services sector, instigating innovation, provoking numerous questions and methodological hurdles, as well as influencing business

<sup>1</sup> Faculty of Economics, University of Tirana, Arben Broci, 1, 1001, Tirana, Albania

operations and investment strategies. Consequently, sustainable finance has garnered considerable attention from a growing array of market players, policymakers, prudential supervisors, and securities regulators.

An increasing number of regulators, supervisors, and businesses are acknowledging climate-related risks as a significant source of financial risk, capable of impacting not just individual firms or sectors, but also the broader financial system stability. Both the tangible impacts of escalating temperatures and the shift towards a low-carbon economy can unleash risks with "unique characteristics compared to other structural risks." These traits encompass their "extensive reach in terms of scope and scale, their predictability, their permanence, and their reliance on immediate actions." This recognition has heightened the attention of several prudential regulators and supervisors on these matters, falling within their remit of ensuring the financial system's resilience against significant risks.

## 2. CLIMATE-RELATED RISKS, OPPORTUNITIES, AND FINANCIAL IMPACTS

### 2.1. Climate-Related Risks

Climate-related risks can be divided into two main categories: transition risks and physical risks.

Transition risks are risks associated with the transition to a lower-carbon economy. These risks can arise from changes in policy, law, technology, and markets. For example, organizations may face policy risks if governments implement carbon pricing or other regulations that make it more expensive to emit greenhouse gases. They may also face legal risks if they are sued for failing to mitigate or adapt to climate change. And they may face market risks if there is a shift in demand for their products or services due to climate change.

Physical risks are risks that arise from the physical impacts of climate change. These risks can include damage to assets from extreme weather events, such as floods or hurricanes. They can also include changes in water availability, food security, and temperature patterns that can disrupt businesses.

Both transition risks and physical risks can have a significant impact on an organization's financial performance. Organizations that are not prepared for these risks may face financial losses, damage to their reputation, or even bankruptcy.

Here is a table that summarizes the two types of climate-related risks:

**Table 1.** Types of climate-related risks

Risk Type	Description	Examples
<b>Transition risks</b>	Risks associated with the transition to a lower-carbon economy	Policy risks, legal risks, market risks, technology risks
<b>Physical risks</b>	Risks that arise from the physical impacts of climate change	Damage to assets from extreme weather events, changes in water availability, food security, and temperature patterns

**Source:** Own processing

It is important for organizations to understand the climate-related risks that they face and to take steps to mitigate these risks. This includes understanding the potential impacts of climate

change on their operations, supply chains, and markets. It also includes developing strategies to adapt to climate change and to reduce their own greenhouse gas emissions.

Organizations that are prepared for climate-related risks will be better positioned to succeed in the future.

## 2.2. Climate-Related Opportunities

Efforts to mitigate and adapt to climate change can also create opportunities for organizations. These opportunities can include:

**Resource efficiency:** Organizations can reduce their operating costs by improving efficiency across their production, distribution, and transportation processes. This can be done by using less energy, water, and materials.

**Low-emission energy sources:** Organizations can switch to low-emission energy sources, such as solar and wind power, to reduce their greenhouse gas emissions.

**New products and services:** Organizations can develop new products and services that help to mitigate climate change. For example, they could develop energy-efficient appliances or renewable energy technologies.

**New markets:** Organizations can access new markets by providing products and services that are in demand in the transition to a low-carbon economy. For example, they could provide energy efficiency consulting services or renewable energy financing.

**Resilience:** Organizations can build resilience to the impacts of climate change by making their operations more adaptable to extreme weather events and other changes. This could involve investing in infrastructure that can withstand flooding or drought or developing contingency plans for supply chain disruptions.

The specific opportunities that are available to an organization will depend on its industry, location, and other factors. However, all organizations can benefit from taking steps to mitigate and adapt to climate change.

Some additional details about each of the opportunities are: resource efficiency, low-emission energy sources, new products and services, new markets, and resilience.

Climate change is a complex and challenging issue, but it also presents opportunities for organizations that are willing to take action. By taking steps to mitigate and adapt to climate change, organizations can reduce their risks, improve their bottom line, and make a positive impact on the environment.

## 2.3. Financial Impacts

Improving the disclosure of the financial impacts of climate-related risks and opportunities on an organization is a primary objective of the Task Force on Climate-related Financial Disclosures (TCFD, 2017). For more enlightened financial decision-making, investors, lenders, and

insurance underwriters must comprehend how climate-related risks and opportunities could influence an organization's future financial standing, as depicted in its income statement, cash flow statement, and balance sheet. Although climate change impacts almost all economic sectors, the exposure level, risk type, and impact of climate-related risks vary across sectors, industries, geographies, and organizations.

### **3. FINANCIAL REPORTING CONSIDERATIONS**

Climate-related and emerging risks can lead to financial implications such as asset impairment, altered asset life, revaluation of assets, increased costs, reduced demand, recognition of provisions for onerous contracts, potential fines, penalties, and altered credit losses for loans and financial assets. Besides financial reporting, companies are increasingly focusing on sustainability due to critical issues like climate change, biodiversity loss, population growth, and global economic development. This has led to increased spending on sustainability initiatives and communication of efforts to stakeholders. The increasing issuance of environmental and sustainability reports raises questions about the rationale and benefits of such reporting. The decisions, investments, and activities related to climate change have significant financial impacts, necessitating stakeholders to closely monitor climate-related decisions, activities, financial developments, and expectations. Various recommendations, frameworks, and standards guide climate change-related business reporting. International financial reporting standards discuss provisions and explanations related to climate change, providing necessary information and examples for enterprises to report on climate change.

#### **3.1. Climate Change and IFRS Standards**

Companies must factor in climate change, incorporating the associated risks and evaluations into their financial statements. In preparing financial statements, organizations should evaluate climate-related events when determining what to recognize, how to appraise approved assets and liabilities, and the details to disclose. This stems from the stakeholders' expectation that the immediate financial consequences of major climate-related concerns be transparently communicated within the financial statements. Sharing the fiscal repercussions of climate-related matters equips users with superior data, facilitating more informed and efficient engagement, assessment, decision-making, and capital distribution. Revealing these climate concerns also allows markets to gauge climate change's probable future financial repercussions more adeptly.

This aids in the necessary capital resource shift towards a more carbon-efficient economy (CDSB, 2020, p. 8) Following this, the standards set by the International Accounting/Financial Reporting Standards (IFRS, 2021) concerning climate change are detailed:

##### **3.1.1. International Accounting Standards (IAS) 1 Presentation of Financial Statements**

In IAS 1, it is stated that financial statements should include important information in order to be understandable. IAS 1 requires disclosure in footnotes of information that is not presented elsewhere in the financial statements but is intended to be understood. If the information can be reasonably expected to influence decisions made by investors, it will be relevant. According to IAS 1 116, an entity shall disclose in the footnotes at the balance sheet date information about key assumptions about the future and the main sources of estimation uncertainties that pose significant risks of causing material adjustments to the book values of assets and liabilities in the following financial year.

IAS 1 article 23 states that the financial statements will be prepared according to the concept of continuity. Moreover, the following statement regarding continuity is included in the IAS 1 article 24. “In assessing the suitability of the business continuity concept, management considers the available information at least for twelve months after the balance sheet date, although it is not limited to this. In assessing whether a continuity of preparedness basis is appropriate, information on climate matters, along with other uncertainties, should be taken into account (Ernst Young, 2020, p. 2). This will become an increasingly important issue, especially for businesses operating in carbon-intensive industries or exposed to significant physical climate risks (CDSB, 2020, p. 16).

### 3.1.2. IAS 37 Provisions, Contingent Liabilities and Contingent Assets

Climate-related risks and uncertainties can impact the estimation of new and existing provisions as per IAS 37. A provision is recognized when there is a present obligation from a past event, a probable outflow of economic benefits to settle the obligation, and the liability can be reliably estimated. Provisions are reviewed and adjusted at the end of each reporting period to reflect the best available estimate. Businesses may need to account for new provisions due to new climate-related liabilities, such as premature decommissioning of emission-generating assets, or existing obligations now deemed likely, like losing a pollution-related lawsuit. Provisions for environmental rehabilitation, common in the mining sector, may arise in other sectors. IAS 37 article 10 defines a constructive obligation as a liability arising from the entity's commitment to others, creating a valid expectation that it will fulfill these responsibilities. Even without legal obligations, a well-publicized environmental policy and commitment to clean up pollution can create an assumed obligation for a corporation.

### 3.1.3. IAS 36 impairment of Assets

Per IAS 36 article 9, "Every reporting period requires an entity to check for signs that an asset might be impaired. If such signs are present, the entity determines the recoverable value of the asset." If the impairment assessments overlook the repercussions of climate-related factors, the recorded value of an entity's assets or cash-generating units (inclusive of goodwill) might be inflated. Entities must consistently check for impairment signs during every reporting cycle. Climate-related exposures might suggest that an asset (or a collection of assets) has diminished in value. For instance, if there's declining demand for products that release greenhouse gases, it could suggest potential challenges for a manufacturing plant. Adjustments in climate-related regulations must also be acknowledged. These elements must be recognized when conducting the yearly goodwill impairment analysis (Ernst Young, 2020, p. 3). Recognizing these as impairment indicators necessitates companies to decide the effects of such risks on their cash flows during their impairment assessments (CDSB, 2020, p. 19).

IAS 36 mandates that when the recoverable amount is derived from its value in use, it should rest on credible and defensible premises that echo the management's optimal predictions of prospective economic scenarios. Organizations must ponder whether climate-related events influence these premises. Details about the incorporation of climate threats in recoverable value evaluations are relevant for financial statement users, especially when such risks, like new emission-cutting laws that raise operational expenses, could greatly impact a business. Furthermore, in particular cases, the foundational premises utilized in calculating the recoverable value, and data regarding conceivable variations in these premises, should be unveiled. Climate-related factors might feasibly impact what's regarded as potential variations (Ernst Young, 2020, p. 3).

### 3.1.4. IAS 16 Tangible Fixed Assets

The challenges posed by climate-related factors may necessitate adjustments in business expenditure to modify operational activities. Entities should discern if such costs qualify as assets and decide if they should be classified under tangible or intangible assets. IAS 16 Article 51 mandates companies to reassess the anticipated residual values and the projected useful lifespans of assets at least once a year (Ernst Young, 2020, p. 2). As a result, those compiling financial reports must evaluate how climate-driven factors could influence the longevity and residual worth of the assets in possession. Alterations in these parameters impact the annual depreciation amount and might also signal potential asset impairment (CDSB, 2020, p. 21). For instance, if a company aiming to shift to a low-carbon production model sets a goal of achieving "net zero" emissions by 2030, it might have to transition to machinery aligned with this objective. This transition can subsequently modify the asset's estimated useful life, impacting its residual value and depreciation timeframe. Costs dedicated to research and innovation by companies to align with this new model will only be categorized as intangible assets if they meet specific benchmarks; otherwise, they'll be treated as expenditures (Gedik, 2021).

### 3.1.5. IFRS 13 Fair Value Measurement

Climate-related issues could influence the valuation of assets and liabilities at their fair value within financial statements. The perception of market participants regarding potential climate-related regulations, for instance, may impact the fair value of assets or liabilities. Additionally, disclosures concerning fair value measurements might be affected by climate-related considerations. In particular, measurements that fall under level 3 of the fair value hierarchy, which rely on unobservable inputs essential for these valuations, may be influenced by such factors (Anderson, 2019).

The measurement of fair value is required in numerous contexts in IFRS financial statements, and IFRS 13 is referenced as the source of guidance for that measurement.

When determining fair value, it's crucial to recognize that the financial consequences of ongoing physical climate risks, like increasing sea levels, are typically foreseen over a longer period. Therefore, their present value might be somewhat diminished due to the time value of money. However, these risks present both widespread and unique challenges to investors. In instances where physical climate risks, whether sudden or prolonged, are identified, they must be factored into the fair value calculation.

Table 2 sets out an illustration of how climate-related risks and opportunities can be reflected in the three typical valuation approaches of Fair Value:

In practice, terminal values are usually derived by extending the last year's cash flow projections using a terminal or perpetual growth rate. For this method to be valid, the cash flow projections' final year should mirror a company's consistent operational or developmental phase. If a company hasn't achieved a stable state concerning the effects of climate-related factors, extending the explicit cash flow forecast period or adjusting for anticipated future climate-related impacts might be necessary. Choosing a suitable terminal growth rate involves significant judgment, as minor variations in this rate can substantially alter the terminal value. Companies facing climate change challenges and failing to effectively mitigate these risks might experience reduced or even negative long-term perpetual growth rates.



**Table 2.** Climate-related risks and opportunities in the three typical valuation approaches

Approaches	Market	Income	Cost
Typical valuation technique	Earnings and book value multiples	Discounted cash flows	Replacement cost or net asset value
Key inputs	Earnings (e.g. Revenue, EBITDA, net earnings, etc.) Book value Market multiples (i.e. Transaction or trading)	Forecast P&L and cashflows (including capex) Discount rate Terminal growth rate	Cost to replace or redevelop the asset Functional and economic obsolescence
How climate risks may impact key inputs	Climate risks may impact the revenue (e.g. lower volume or pricing) and/or cost base (additional maintenance, fines, emission taxes, etc.). Market multiples are obtained from traded comparable companies or comparable transactions. However, it may not be clear if/how climate risks are reflected by those comparators. Careful consideration should be given to the valuation subject given the asset-specific nature of climate risks.	Climate risks can affect the cash flows involved in this calculation in several ways, such as by decreasing cash inflows (through reduced volume or pricing) or increasing cash outflows (due to extra maintenance, penalties, emission taxes, capital expenditures, etc.). If cash flows are not modified to reflect climate-related risks, the discount rate might be altered instead, incorporating an appropriate risk premium or discount. The long-term prospects of an asset or business could also be influenced, leading to the use of an adjusted terminal growth rate or a different method for calculating terminal value. Considering the unpredictability of climate events, employing an expected value approach or simulating various scenarios might be necessary.	Greater obsolescence may occur as a result of technology substitution (transition risk). The asset in question may be redundant for a future net-zero business.

**Source:** Integrating climate-related matters into financial reporting, CDSB & KPMG, 2021

### 3.1.6. IFRS 9 Financial instruments and IFRS 7 Financial instruments: Disclosures

The impairment guidelines of IFRS 9 necessitate the consideration of future-oriented data to account for anticipated credit deficits. For entities implementing these guidelines, especially financial institutions like banks, identifying if the credit risk has risen notably since its first acknowledgment is essential for estimating anticipated credit deficits. This entails the bank evaluating any real or forecasted negative shifts in the borrower's regulatory, economic, or technological backdrop that might substantially impact their debt repayment capacity. When banks fund projects or provide loans to entities susceptible to climate change effects, it's crucial to analyze how their vulnerability to climatic risks might influence the anticipated deficits on these loans and investments (Anderson, 2019). Factors related to climate, such as environmental calamities or policy shifts, can influence both the bank's risk of credit losses and the borrower's capacity to fulfill their debt obligations. Such climate-driven concerns can also magnify the bank's risk of facing credit losses.

## **Classification and measurement of financial assets**

Measuring and classifying financial assets, such as trade receivables, investments, and derivatives, has become more complex due to the rise of green and sustainable products, which were not initially accounted for in IFRS 9. This includes green loans and bonds, loans linked to green indices, and loans with borrower-specific ESG features. Assessing these features necessitates evaluating credit risk, profit margin, and de minimis features, as they can impact the loan's probability of default and financial institutions' SPPI assessment.

### **3.1.7. IFRS 17 – Insurance Contracts**

Climate-related factors could influence the primary assumptions used in calculating insurance liabilities. This could affect aspects like the frequency, severity, or timing of insured incidents, including business disruptions, property damage, illnesses, and deaths.

Additionally, climate-related factors are likely to affect disclosures under IFRS 17. This standard mandates the disclosure of significant judgments and any changes therein when implementing IFRS 17, as well as details about the nature and extent of risks from contracts covered by IFRS 17 (IFRS 17.93). Insurers might also need to report how climate-related issues affect risk exposure (IFRS 17.124), and risk concentration (IFRS 17.127), and provide sensitivity analysis data showing potential impacts on profit, loss, and equity due to reasonably possible changes in risk exposures at the end of the reporting period (IFRS 17.128).

Lastly, as major asset holders, insurers' investments are likely vulnerable to climate risk factors. However, the guidelines for measuring and disclosing information related to these investments are not part of IFRS 17 but are addressed in other accounting standards like IFRS 7, 9, and 13.

## **4. FUTURE OF CLIMATE CHANGE IMPACT ON FINANCIAL REPORTING**

The future of climate change's impact on financial reporting is likely to see a continued convergence of these frameworks and standards. As the demand for climate-related information grows, organizations will need to find ways to provide more comprehensive and transparent reporting. This will require the development of new standards and tools, as well as the collaboration of different stakeholders.

Here are some of the key trends that are likely to shape the future of climate change's impact on financial reporting:

**Increased demand for climate-related information:** Investors, lenders, and other stakeholders are increasingly demanding information about the climate-related risks and opportunities facing organizations. This is due to many factors, including the growing awareness of the risks posed by climate change, the increasing regulation of climate-related activities, and the growing demand for sustainable investments.

**Development of new standards and tools:** As the demand for climate-related information grows, organizations will need to find ways to provide more comprehensive and transparent reporting. This will require the development of new standards and tools, such as the [\(TCFD, 2017\)](#) framework.

Collaboration of different stakeholders: The development of climate-related financial reporting standards and tools will require the collaboration of different stakeholders, such as regulators, accounting firms, and investors. This is because climate change is a complex issue that requires a multi-stakeholder approach.

The future of climate change's impact on financial reporting is uncertain, but it is clear that this is an area that is rapidly evolving. Organizations that are prepared to adapt to these changes will be well-positioned to succeed in the years to come.

## 5. CONCLUSION

Climate change and its impact have been for long the foreword in many discussions and articles extending well beyond the economic topics. In this article, the measures and approaches that are suggested throughout the literature to tackle the increased burden of disclosing financial information related to climate change were discussed. One major area where climate change has already made an impact is the financial reporting requirements including Financial Statements, Notes, and Disclosures.

Disclosures are presented so that those reviewing the financial statements can comprehend how the management evaluates various primary sources of upcoming uncertainties and estimations. As such, it's crucial to offer information about the assumptions concerning climate change's impact, especially when there's a notable risk that it might lead to significant changes in the recorded values of assets and liabilities in the forthcoming fiscal period and/or influence the choices of investors.

The risks and financial consequences of policy changes vary depending on their nature and implementation timing. Legal or litigation risk is another significant concern, evidenced by the recent increase in climate-related litigation cases initiated by property owners, municipalities, states, insurers, shareholders, and public interest groups.

The financial implications of climate-related challenges for organizations are often not straightforward or immediate. Many organizations find it difficult to identify relevant issues, evaluate potential impacts, and incorporate material concerns into financial reports. This challenge is generally attributed to (1) limited understanding of climate-related issues within organizations; (2) a focus primarily on short-term risks, neglecting those that might emerge over a longer period; and (3) the complexity in quantifying the financial impacts of climate-related matters.

To assess the financial repercussions and meet the required duty, it's essential to mention any uncertainties about when or how much resources might be expended, if relevant. New potential liabilities tied to climate issues might have to be revealed, especially for those liabilities or existing uncertainties previously deemed as having a distant likelihood. This could require revealing a potential liability concerning possible lawsuits and penalties stemming from environmental and related rules if the organization might have breached a regulation but has less than a 50% probability of making a payment (Anderson, 2019).

Heightened risk due to physical climate impacts could signal an asset's impairment. Physical climate risks come in two forms: chronic and acute. Chronic risks relate to long-term shifts in climate patterns, like persistent increases in sea levels or temperatures. On the other hand, acute risks are event-driven, involving more severe and frequent occurrences of extreme weather conditions, such as floods or wildfires.

## References

- Anderson, N. (2019). In Brief – IFRS Standards and Climate-Related Disclosures. <https://www.ifrs.org/content/dam/ifrs/news/2019/november/in-brief-climate-changenick-anderson.pdf>
- CDSB. (2020). The State of EU Environmental Disclosure in 2020. <https://www.cdsb.net/nfrd2020>
- CDSB & KPMG. (2021). Accounting for Climate: Integrating Climate-Related Matters Into Financial Reporting. [https://www.cdsb.net/sites/default/files/cdsb\\_climateaccountingguidance\\_2021\\_v5\\_pages.pdf](https://www.cdsb.net/sites/default/files/cdsb_climateaccountingguidance_2021_v5_pages.pdf)
- Ernst Young. (2020). Effects of Climate-Related Matters on Financial Statements. [https://assets.ey.com/content/dam/ey-sites/ey-com/en\\_gl/topics/ifrs/ey-devel178-climate-change-november-2020.pdf](https://assets.ey.com/content/dam/ey-sites/ey-com/en_gl/topics/ifrs/ey-devel178-climate-change-november-2020.pdf)
- Gedik. (2021). Annual Report. <https://gedik.com/faaliyet-raporu-2021/pdf/Gedik-Yatirim-Annual-Report-2021.pdf>
- IFRS. (2021). <https://www.ifrs.org/news-and-events/news/2022/04/ifrs-foundation-publishes-2021-annual-report/>
- TCFD. (2017). Final Report: Recommendations of the Task Force on Climate-Related Financial Disclosures. <https://assets.bbhub.io/company/sites/60/2020/10/FINAL-2017-TCFD-Report-11052018.pdf>

## Additional reading

- Deloitte. (2020a). A Closer Look – Investor Demand for Corporate Reporting in Line With the Paris Agreement on Climate Change. <https://www.iasplus.com/en/publications/global/a-closer-look/corporate-reporting-climate-change>
- Deloitte. (2020b). Annual Report Insights 2020 – Planet. <https://www2.deloitte.com/content/dam/Deloitte/uk/Documents/about-deloitte/deloitte-uk-annualreport-insights-2020-planet.pdf>
- Herzig, C., & Schaltegger, S. (2006). Corporate Sustainability Reporting. An Overview. *Sustainability Accounting and Reporting*, 301-324. [https://doi.org/10.1007/978-1-4020-4974-3\\_13](https://doi.org/10.1007/978-1-4020-4974-3_13)
- IAASB. (2020). The Consideration of Climate-Related Risks in an Audit of Financial Statements. <https://www.iaasb.org/publications/consideration-climate-related-risks-audit-financial-statement>
- IFRS Foundation. (2017). IFRS Practice Statement 2: Making Materiality Judgements. <https://eifrs.ifrs.org/eifrs/bnstandards/en/PS02.pdf>
- Manes-Rossi, F., Tiron-Tudor, A., Nicolò, G., & Zanellato, G. (2018). Ensuring More Sustainable Reporting in Europe Using Non-Financial Disclosure—De Facto and De Jure Evidence. *Sustainability*, 10(4), 1162. <https://doi.org/10.3390/su10041162>



# Water and Air Purification Technologies and Equipment in the Sustainable National Development Context

Nicoleta Rotariu<sup>1</sup>   
Cristian Silviu Simionescu<sup>2</sup> 

Received: August 29, 2023  
Revised: December 6, 2023  
Accepted: January 4, 2024  
Published: March 16, 2024

## Keywords:

Environmental protection;  
Sustainable development;  
"Anthropocene Era"



Creative Commons Non Commercial CC BY-NC: This article is distributed under the terms of the Creative Commons Attribution-Non-Commercial 4.0 License (<https://creativecommons.org/licenses/by-nc/4.0/>) which permits non-commercial use, reproduction and distribution of the work without further permission.

**Abstract:** *The aim of this paper consists of an interdisciplinary approach to air and water environmental factors impact evaluation to eliminate the potentially adverse effects, using high-performance technologies and equipment so that the status of the ecosystems is not affected by human activities.*

*This new era can be defined as the "Anthropocene Era" which impact also requires increased responsibility, conscious management, and environmental protection area-related activities.*

*The theoretical significance and applied value of the paper consists of highlighting the problems faced by Romania regarding the impact of pollution on the environmental factors of water and air, using performance methods and techniques.*

*The authors of the paper, following the risk analysis, highlight the impact generated by pollution, to reduce these effects and reach the targets assumed by Romania as a member state of the United Nations and the European Union, within the UN Summit for Sustainable Development.*

*Sustainable development also seeks to find a stable theoretical framework for decision-making in any situation where there is a human-environment relationship.*

*Sustainable development promotes the concept of reconciling economic and social progress without jeopardizing the natural balance of the planet and at the same time without compromising the ability of future generations to meet their own needs.*

## 1. INTRODUCTION

The water and air importance for life, as components of the ecosystem, is increasingly clear in the "Anthropocene Era" whose impact requires increased responsibility too, conscious management, and related activities in the field of environmental protection.

The aim of the paper consists of an interdisciplinary approach to the evaluation of the impact on the air and water environmental factors in order to eliminate the potentially adverse effects, using high-performance technologies and equipment so that the state of the ecosystems is not affected by human activities.

The objectives of the paper were based on impact assessment and the modeling of ecological risks associated with the degree of water and air pollution. The basic method used was risk analysis in order to establish the impact on the environment.

<sup>1</sup> "Dunarea de Jos" University of Galati, Str. Domneasca no. 47, Galati, Romania

<sup>2</sup> "Dunarea de Jos" University of Galati, Str. Domneasca no. 47, Galati, Romania

Environmental impact assessment methods used (Rojanschi & Grigore, 2006):

- The pollution index method – is applied for the water environmental factor (Ip). The model frames pollution indices on a creditworthiness scale with the help of which it was quantified the effects of pollutants.
- The Global Pollution Index (GPI) method – makes a synthetic assessment based on the quality indicators specific to the environmental factors, graphically correlated.
- The quality index method – allows for estimating the effects of environmental factors, transforming qualitative aspects into quantifiable quantitative quantities.

The authors of the paper, after analyzing the risks, highlight the impact of pollution, with the aim of reducing these effects and achieving the goals that Romania has taken as a member state of the United Nations and the European Union, within the framework of the UN Summit for Sustainable Development.

## 2. METHODS USED TO DETERMINE WATER POLLUTION

The methods used for the environmental impact assessment consisted of going through several stages of synthetic assessments based on quality indicators that reflect the state of the water environmental factors that are then correlated through graphic methods. The sources of pollution in Brăila County, of the Danube River, were identified and characterized. As a result of the Danube River monitoring, it was established that in the discharge points of wastewater from economic agents, there is a pronounced deterioration of the water quality.

The impact evaluation produced by industrial and agricultural activities was both analyzed and quantified. This assessment was also based on the ecotechnological analysis of the technological processes and the risks that can generate accidents in the environment (Amza, 2009).

Following the determinations carried out on raw water samples from the Danube, it was established that the high level that sometimes exceeds the allowed limit of pollution indicators is due to anthropogenic causes, which causes the heavy loading of the Danube River in the territory of Brăila county.

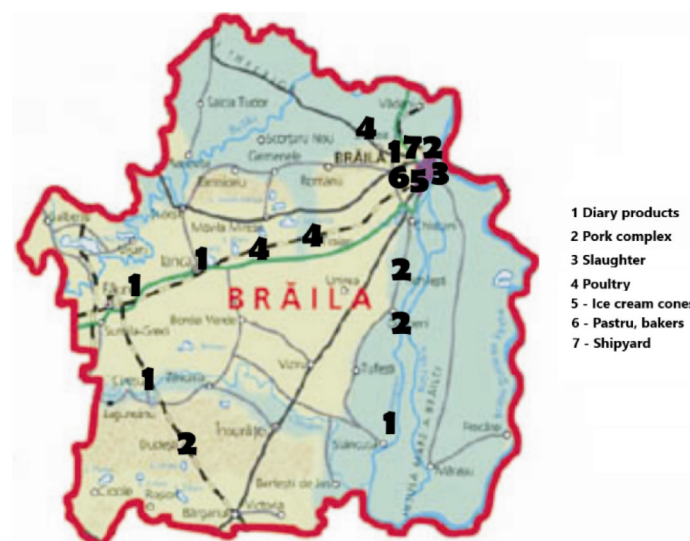


Figure 1. Location of the main pollution sources in Brăila County

Source: Own research

In order to present as explicitly as possible the impact that anthropogenic activities produce on the water environmental factor, these sources of pollution have been positioned on the map of Brăila municipality and county (Figure 1).

Environmental indicators may be used to measure both environmental performance and efforts to improve it (Avram, 2006).

The indicators may be used within the environmental management system to check how any company has reached its environmental policy targets, but they may be used by companies that have not developed such a system too.

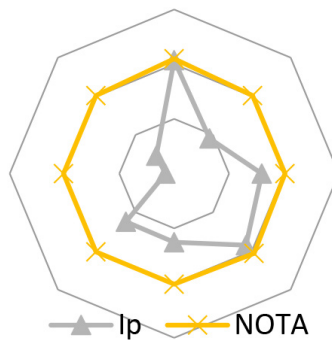
In the zootechnical sector, pollutant emissions occur due to the high density of animals in relation to the agricultural area assigned to the zootechnical sector, the improper location of farms near-surface water, or on land with surface groundwater, near homes, the defective way of storage and drainage of effluents, the excessive use of manure accumulated in livestock farms.

The pollution index method used in assessing the impact on the environment establishes some limits between different degrees of pollution as well as general action measures on the polluting environmental factor. Pollution indices are placed on a creditworthiness scale (Rojanschi & Grigore, 2006).

The pollution index  $I_p$  is calculated for each environmental factor with the formula:

$$I_p = (CMA - CE)/(CMA + CE) \cdot 100 \quad (1)$$

CMA – maximum allowed concentration  
CE – measured or estimated concentration



**Figure 2.** Graphical representation of  $I_p$  and the credit score for the pork breeding farm

**Source:** Own research

The global pollution index method was used as a method for evaluating the impact on the environment because it may be used to realize a synthetic assessment based on quality indicators that are then correlated graphically (Rojanschi & Grigore, 2006).

Figure 3 shows global pollution indices for a pork farm. The surface of the triangle resulting from the union of the effective credit points of each of the three environmental factors ( $S_r$ ,  $mm^2$ ) will represent the real state of the environment affected only by the activity proposed for analysis. The global pollution index  $I_{pg}$  is the ratio between  $S_i$  and  $S_r$ .



**Figure 3.** IPG Pork farm

**Source:** Own research

The global pollution index IPG represents the ratio between 100 and the arithmetic mean of the credit scores obtained on the assessed environmental components.

$$IPG = 5.35 - \text{environment affected by human activity}$$

The quality index method is a method that allows estimating the effects produced by a pork farm on environmental factors, it transforms the qualitative aspects into quantitative ones, that allow their aggregation and averaging on a scale of the following type (Macoveanu, 2003):

- “+” → positive influence;
- “0” → without influence;
- “-” → negative influence.

Table 1 shows the effects of the pork farm on environmental factors.

**Table 1.** Effects on Environmental Factors

Sources of pollution	Effects on environmental factors			
	Water	Air	Ground	Human Health
Raw materials reception	0	0	0	0
Animal shelter	-1	0	0	0
Cleaning	-1	0	0	0
Wastewater evacuation	-1	0	0	-1
Excrement collection	-1	-1	-1	-1
Thermal plant	0	-1	0	0
Spread manure as fertilizer	-1	-1	-1	-1
Effect size	-5	-3	-2	-3

**Source:** Own calculations

Pork farms are characterized by a high pollution potential and a negative impact on the environment. The amount of manure, the complex chemical composition and the volume of mixture with wastewater, which is discharged from animal breeding complexes vary depending on a multitude of factors such as species, breed, size of the animals, type and the production system, system of maintenance and operation, feeding regime, technical condition and operation of installations and equipment.

The impact of livestock farms on the environment:

- the quality indicators of the discharged wastewater, except for pH, exceed the permitted limits imposed by both NTPA - 001 and NTPA 002;



- the most affected environmental factor is water because the discharged water is characterized by: high organic pollution, high fat content, high content of solid substances in the discharged water, and high content of disinfection and cleaning substances.

In conclusion, all three methods used in the assessment of the impact on the environment, lead to the same result, namely, mainly the pollution of the environmental factor water and then of the other environmental factors as well as of human health, is caused in the first place of insufficiently purified or untreated waters from animal breeding and meat processing farms, followed by dairy and pastry factories (Moater, 2006).

### 3. METHODS USED TO DETERMINE AIR POLLUTION

Ambient air quality is regulated in Romania by Law no. 104/2011 on ambient air quality with subsequent amendments and additions, transposing Directive 2008/50/EC of the European Parliament and of the Council on air quality and cleaner air in Europe and Directive 2004/107/EC of the European Parliament and of the Council regarding arsenic, cadmium, mercury, nickel and polycyclic aromatic hydrocarbons in ambient air (Directive 2008/50/CE, Directive 2004/107/CE).

Air quality assessment, on the Romanian territory, is carried out based on common methods and criteria, established at the European level, by:

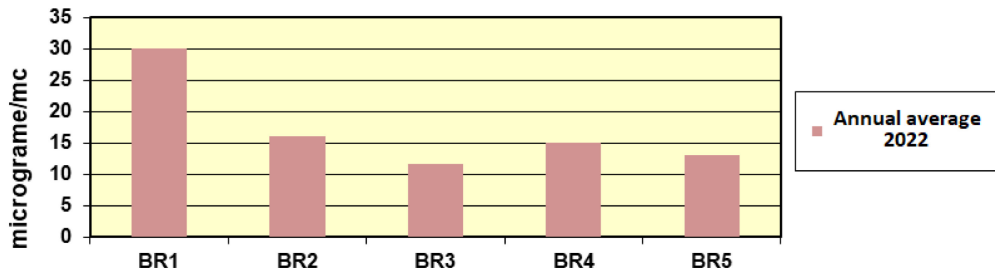
- measurements at fixed points of the pollutants regulated by law 104/2011, carried out continuously, in the automatic monitoring stations belonging to the National Air Quality Monitoring Network;
- modeling techniques;
- indicative measurements (Law no. 104/2011).

The automatic network in Braila County consists of 5 sampling points, located as follows:

- Brăila Station 1 - Traffic-type air quality monitoring station, which is located on Calea Galați, no. 53. Monitored pollutants NO<sub>x</sub>, SO<sub>2</sub>, CO, PM<sub>10</sub>, benzene.
- Brăila Station 2 - Urban air quality monitoring station, which is located in Piața Independței no. 1. Monitored pollutants: NO<sub>x</sub>, SO<sub>2</sub>, CO, O<sub>3</sub>, PM<sub>10</sub>, PM<sub>2.5</sub>, benzene, weather parameters.
- Brăila Station 3 – Suburban air quality monitoring station, which is located in Cazasu Com-mune, Brăila County. Monitored pollutants: NO<sub>x</sub>, SO<sub>2</sub>, CO, O<sub>3</sub>, PM<sub>10</sub>, benzene, weather parameters.
- Brăila Station 4 – Industrial air quality monitoring station, which is located on Baldovinești Road (North Station). Monitored pollutants: NO<sub>x</sub>, SO<sub>2</sub>, CO, O<sub>3</sub>, PM<sub>10</sub>, weather parameters.
- Brăila Station 5 – Industrial air quality monitoring station, was relocated to Ianca in December. Monitored pollutants: NO<sub>x</sub>, SO<sub>2</sub>, CO, O<sub>3</sub>, PM<sub>10</sub>, benzene, weather parameters.

Nitrogen oxides come mainly from the burning of solid, liquid and gaseous fuels in various industrial, residential, commercial, institutional and road transport installations. The concentrations of NO<sub>2</sub> in the surrounding air are evaluated using the hourly limit value for the protection of human health (200 µg/m<sup>3</sup>), which can be exceeded 18 times/year, and the annual limit value for the protection of human health (40 µg/m<sup>3</sup>), following Law no. 104/2011.

The hourly limit value for the protection of human health (200 µg/m<sup>3</sup>) was not exceeded at any station. There were no exceedances of the alert threshold value (400 µg/mc average over 1 hour, measured 3 consecutive hours) for nitrogen dioxide.



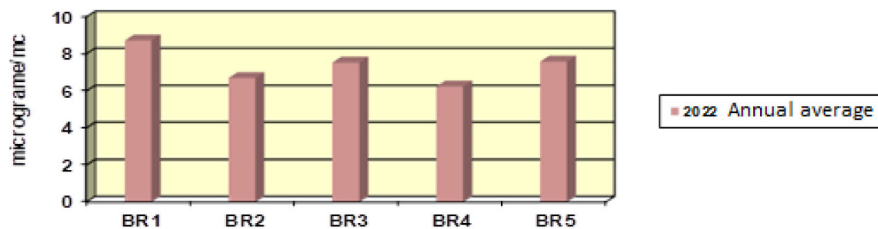
**Figure 4.** Average annual concentration of nitrogen dioxide in 2022

Source: Law no. 104/2011

In 2022, the average annual values according to nitrogen dioxide to the measurements are below the limit value of  $40 \mu\text{g}/\text{m}^3$  (Law no. 104/2011).

$\text{SO}_2$  concentrations in the surrounding air are evaluated using the hourly limit value for the protection of human health ( $350 \mu\text{g}/\text{m}^3$ ) which must not be exceeded more than 24 times/year and the daily limit value for the protection of human health ( $125 \mu\text{g}/\text{m}^3$ ) which must not be exceeded more than 3 times/year. Law no. 104/2011 does not establish the annual limit value for sulfur dioxide, only the hourly and daily limit value (Law no. 104/2011).

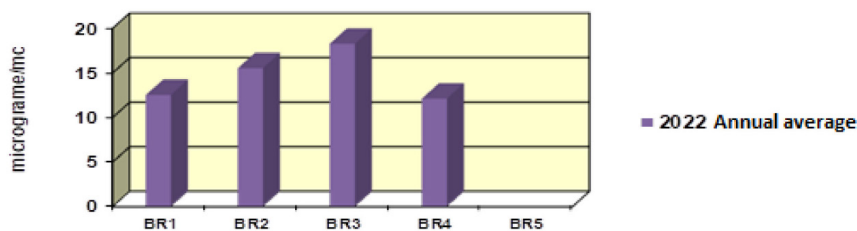
During the year 2022, there were no values higher than the daily limit value for the protection of human health ( $125 \mu\text{g}/\text{m}^3$ ) provided for in Law no. 104/2011 for the air factor (Law no. 104/2011).



**Figure 5.** Average annual concentration of sulfur dioxide in 2022

Source: Law no. 104/2011

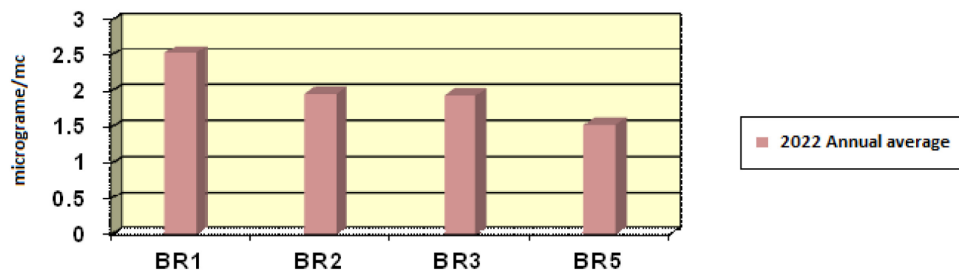
The concentrations of suspended particles  $\text{PM}_{10}$  in the surrounding air are evaluated, according to Law no. 104/2011, using the daily limit value ( $50 \mu\text{g}/\text{m}^3$ ) which must not be exceeded more than 35 times/year and the annual limit value, determined gravimetrically ( $40 \mu\text{g}/\text{m}^3$ ) (Law no. 104/2011).



**Figure 6.** Average annual  $\text{PM}_{10}$  gravimetric concentration in 2022

Source: Law no. 104/2011

In 2022, benzene was monitored in BR1 - traffic station from Brăila municipality, BR2 - urban background station from Brăila municipality, BR3 - suburban background station from Cazasu commune, BR5 - industrial type station from Chiscani commune, all with captures below the minimum allowed value) (Law no. 104/2011).



**Figure 7.** Average annual concentration of benzene in 2022

Source: Law no. 104/2011

The average annual values recorded were below the annual limit value established in Law no. 104/2011 on ambient air quality ( $5 \mu\text{g}/\text{m}^3$ ) (Law no. 104/2011).

The national strategy regarding atmosphere protection has as its general objective the protection of human health and the environment (Robu & Robu, 2003).

The key objectives are:

- maintaining the quality of the surrounding air in the areas and agglomerations where it falls within the limits provided by the legal norms for the quality indicators;
- improving the quality of the surrounding air where it does not fall within the limits provided by the legal norms;
- adopting the necessary measures in order to limit or eliminate negative effects on the environment, including in a cross-border context.

#### 4. FUTURE RESEARCH DIRECTIONS

The 2030 Agenda for Sustainable Development is a result of an international process of analysis, from which it generates that global problems may only be solved through global solutions.

Changing perceptions and awareness of the unprecedented evolution of society, the increase in the birth rate on a global scale, the acceleration of the economies of developing countries, and social disparities have highlighted the limits of planetary growth.

Rising prices of certain resources have highlighted the fact that the Earth can deplete its renewable and non-renewable physical resources, leading to a catastrophic imbalance.

As far as environmental protection is concerned, all the investments that will be made in the Danube basin must be intelligent systems based on the latest scientific and technological developments in which environmental protection is included from the design phase of the systems.

At the same time, the following should be taken into account as priorities: development and expansion of utility infrastructure (water supply, sewage network); ensuring municipal wastewater treatment for all agglomerations with over 2000 equivalent inhabitants; reduction of nitrate pollution from agricultural sources for all designated vulnerable areas on the territory of Romania and elimination of discharges of priority hazardous substances into waters.

At the Brăila county level, the Air Quality Maintenance Plan was developed, according to HG no. 257/2015 regarding the approval of the Methodology for the development of Air Quality

Plans, Short-Term Action Plans and Air Quality Maintenance Plans. This plan contains a series of measures to keep atmospheric pollutants below the permitted limits, as follows:

- Measures to reduce road traffic emissions;
- Measures to reduce emissions from the wind erosion process;
- Measures to reduce emissions from heating in the residential sector (HG no. 257/2015).

From the analysis of the effects generated by the implementation of the measures, it can be seen that the most important reductions in emissions related to mobile sources are due to the rehabilitation and modernization of traffic arteries.

Reducing the consumption of solid and liquid fuels by expanding the natural gas supply network is the main measure for reducing emissions due to institutional and residential heating.

## 5. CONCLUSION

Sustainable development promotes the concept of reconciliation between economic and social progress without endangering the natural balance of the planet. The idea behind this concept is to ensure a better quality of life for all the inhabitants of the planet and future generations.

Sustainable development brings to the fore a new set of values that will guide the future model of economic and social progress, values aimed mainly at man and his present and future needs, the natural environment - protecting and preserving it, as well as mitigating the current deterioration of ecosystems.

The 2030 Agenda calls for action by all countries, poor, rich and middle-income. This covers issues such as inequality, infrastructure, energy, consumption, biodiversity, oceans and industrialization. The agenda promotes the involvement of all interested parties, by democratizing the decision-making process on the topic of sustainable development. The responsibility and role of young generations to create sustainable development are emphasized.

The ecosystems' status around the world varies according to different specific characteristics and conditions. In general, there is some concern about the state of many ecosystems due to the impact of human activities such as deforestation, pollution, climate change and overexploitation of natural resources. Marine and freshwater ecosystems are also under pressure. Pollution, overfishing and destruction of natural habitats have led to declining fish populations and loss of biodiversity in these environments.

In terms of climate change, they have a significant impact on all ecosystems. Rising global temperatures, changes in precipitation patterns, and increased frequency of extreme weather events can disrupt ecological balance and lead to loss of biodiversity.

However, there are also global and local efforts to protect and conserve ecosystems. Biodiversity conservation, sustainable forest management, marine area protection and natural habitat restoration programs are being implemented.

There are also greater demands for the adoption of policies and measures that reduce the impact of human activities on ecosystems and promote sustainable development.

Only by exploiting the data from the technical and methodological point of view it will be possible to ensure coherence and objectivity in the government act, to optimize cooperation between central public institutions, but also to intensify the professionalization of skills centered on strategic planning and sustainable development.

As a conclusion, the status of the ecosystem around the world is vulnerable and under pressure due to human activities and climate change.

### References

- Amza, G. (2009). Ecotechnologies and sustainable development, vols 1 and 2, Ed. Printech, Bucharest.
- Avram, N. (2006). Theory of pollutant generation processes, Printech Publishing House, Bucharest.
- Directive 2008/50/EC of the European Parliament and of the Council on air quality and cleaner air in Europe
- Directive 2004/107/EC of the European Parliament and of the Council regarding arsenic, cadmium, mercury, nickel and polycyclic aromatic hydrocarbons in ambient air
- HG no. 257/2015 regarding the approval of the Methodology for the development of Air Quality Plans, Short-Term Action Plans and Air Quality Maintenance Plans
- Law no. 104/2011 on ambient air quality with subsequent amendments and additions
- Macoveanu, M. (2003). Methods and techniques for evaluating the ecological impact, Ecozone Publishing House, Iasi.
- Moater, I. (2006). Chemistry and environmental protection, Ed. Bibliotecha, Targoviste.
- Robu, B., & Robu, T. (2003). Trends in the harmonization of Romanian legislation with EU legislation, in the field of environmental protection, Annales USAMV.
- Rojanschi, V., & Grigore, F. (2006). Quantification of sustainable development, Economica Publishing House, Bucharest.


### Additional reading

- Strategia națională pentru dezvoltarea durabilă a României 2030. (2018). <https://www.edu.ro/sites/default/files/Strategia-nationala-pentru-dezvoltarea-durabila-a-Rom%C3%A2niei-2030.pdf>
- European Commission. (n.d.). [https://commission.europa.eu/strategy-and-policy/international-strategies/sustainable-development-goals/eu-holistic-approach-sustainable-development\\_ro](https://commission.europa.eu/strategy-and-policy/international-strategies/sustainable-development-goals/eu-holistic-approach-sustainable-development_ro)





## Africa, Water and Climate Change

Ciprian-Benjamin Benea<sup>1</sup>   
Adina Sacara Onita<sup>2</sup>   
Andra-Teodora Porumb<sup>3</sup> 

Received: August 29, 2023  
Revised: December 6, 2023  
Accepted: January 4, 2024  
Published: March 16, 2024

### Keywords:

Access to water;  
Colonial inheritance;  
Dams;  
Population;  
Water stress



Creative Commons Non Commercial CC BY-NC: This article is distributed under the terms of the Creative Commons Attribution-Non-Commercial 4.0 License (<https://creativecommons.org/licenses/by-nc/4.0/>) which permits non-commercial use, reproduction and distribution of the work without further permission.

**Abstract:** *This paper aims to bring to the European audience the importance of connections between water and climate change on the African continent; even though this continent could be regarded as somewhere in the southern hemisphere, the globalized world we already live in proves the contrary. In fact, it is very close to us. As population dynamics will put higher pressures on available natural resources in Africa, the migratory pressure from that continent, which already is felt on the European continent, not only could bring social or political upheavals there, but it could complicate the socio-economic equilibrium closer to us. Furthermore, in the context of climate change, there are needed some measures to be taken in order to prevent such a scenario from taking place. And among other key resources, the most important, which is related to everything, is water; the way it would be used in Africa and how would it be distributed could make a difference.*

## 1. INTRODUCTION

Africa. First political geography: 55 countries belong to this continent, some of them being islands such as Comoros, Cape Verde, or Seychelles; but the list of big African players focuses on continental countries such as, among others, South Africa, Egypt, Ethiopia, DR Congo or Nigeria.

What is specific to this continent related to water is the fact that it is unequally portioned, with access to water being determined not only by economic or social determinants but also by climate and relief. In Africa, this vital resource is either *abundant* or *scarce*, depending upon *region* and *season*. Everywhere, but especially in Africa – because of these specific traits – water is the most important element providing humans with life's necessities since, according to [U.N.E.P. \(2010\)](#) over “40% of Africans are located in arid, semi-arid regions or dry sub-humid areas, and about 60% live in rural areas” (p. x), depending directly on farming for their livelihoods. If we focus for example upon Ethiopia, also known as “Africa’s water tower”, [Swain \(1997\)](#) points to the enormous precipitation volumes in its northern, central, and southern regions, but the rainfall’s unpredictability and variability make difficult the efficient use of this huge amount of water (p. 675-694). The specific position of Ethiopian hydrology states [Verhoveven \(2021a\)](#) “resembles that of the continent as a whole” (p. 159).

To put things more specific and pressing, in the context of climate change and population evolution, over this natural trait, there is another trait, that has been brought upon the African countries by historical evolution; there manifests nowadays the influence of colonial past and power relations between African countries and political centers of power located far away from Africa.

<sup>1</sup> University of Oradea, Universitatii no.1, Oradea, Romania  
<sup>2</sup> University of Oradea, Universitatii no.1, Oradea, Romania  
<sup>3</sup> University of Oradea, Universitatii no.1, Oradea, Romania

For this reason, it is important to remember always what [Swyngedouw \(2004\)](#) mentioned, describing the connection between the flows of water and those of power: the “metabolisms of water are structured and organized through... relations of domination and subordination, access and exclusion, of emancipation and repression” (p. 29). These are the main factors that make unequal access to water a specific trait of the whole African continent and African countries.

Already mega-cities in the developing world are haunted by immense water shortages, and population dynamics will only add complexity in administrating these cities and their societies. As [World Population Prospects 2022 \(U.N.D.E.S.A., 2022\)](#) show, more than half of the projected increase in global population up to 2050 will be concentrated in 8 countries, 5 of them on the African continent: DR Congo, Egypt, Ethiopia, Nigeria, and Tanzania; the population of countries located in Sub-Saharan Africa “are expected to continuous growing through 2100 and to contribute more than half of the global population increase anticipated through 2050” (p. i).

Another point to be brought to the reader’s attention is related to deficient access to water and poor water quality in Africa, both of them being directly related to different human diseases; in the meantime, it is expected that waterborne diseases would come and hit again, stronger, especially in the context of climate changes. Yet another aspect is related to the technological leap encountered on African rivers during the second part of the last century: it manifests because of large infrastructure projects built – with dams as their core element – as on African rivers there have been encountered multiple negative consequences, among them mentioning the destruction of fishing industries, erosion of the shoreline, degradation of aquatic systems, degradation of living standards for riparian communities, and an increase in waterborne diseases ([Isaacman & Musemwa, 2021, p. 13](#)).

Africa in the years to come will bring together a very *dynamic population* with fast-growing cities, a complicated *colonial inheritance* that has influenced and will determine the social and economic disparities as they are reflected in access to water and its distribution, *human diseases* due to both poor access to water and sanitation and to waterborne pathogens, *technological changes* due to large infrastructure projects aimed at controlling the flow of water, all in the context of *climatic changes* which only add complexity to this framework.

Having these in mind we can ask if there could be any sustainable solution to this problem? Is water a free resource to be provided by the state to its citizens, or water privatization and commodification could be part of a solution for water availability; could be there a magic formula or framework for all African countries, or are there better some local solutions to be identified?

## 2. PREVIOUS EVOLUTIONS

### 2.1. Dams

In Africa, as in other parts of the world, water resource development in the second half of the last century was concentrated on technical and economic aspects, in search of some specific economic gains, as [Tickner et al. \(2020\)](#) mentioned. Until the beginning of this century, scant attention was given to the ecosystems by most promoters of big water infrastructure projects, as financiers, developers, and politicians: the way of thinking of these promoters was one of available resources exploitation, all aiming to cover the rising demand for water, food and energy; little or no attention was given to nature, flora and fauna, or to the multitude of benefits they provide to society at large. As a consequence, the costs of such projects were thought to be only



those connected to construction, maintenance and operation, with social, and ecological costs, and landscapes' destruction being overlooked.

Even these actions were taken with such a magnitude that today there are in the world about 58000 large dams and smaller dams in the number of hundreds of thousands supplying sanitation, pipelines with water sustaining homes and businesses, and irrigations systems, around 65% of world population has to cope with water shortages at least one month yearly and around 2 billion people living with risks due to severe water scarcity; in Africa, South of Equator there are chronically over-busy water systems as a result of fast-growing population, generally speaking, and in urban areas, especially. In Africa, the population is around 1.5 billion (17% of the world population, respectively) while over the 80 years ahead it is expected to get to 2.5 billion, or 40% of the world total (King & Brown, 2021, p. 241).

Related to dams, all disrupt natural river flow, negatively influencing riparian ecosystems. For example, such a (large) dam could store waters from floods during seasonal high precipitation patterns, while downstream of it, floodplains or meadows wouldn't get sufficient amount of water to sustain habitat and grazing for wildlife and livestock. Furthermore, some fish species that need to move upstream for spawning or to cross downriver closer to the sea cannot cross it, and in time their number decline. Another important aspect is that connected to a relatively constant river flow during the year, which could push for favorable conditions that some plants or fishes would increase to a level that could be harmful. Sediments, which in normal conditions would move down the river together with water flows, are stored behind the dam and poor sediment water flow erodes the downstream riverbed and its shores, with direct negative consequences for gene pools (Zdankus et al., 2008, p. 130).

Africa boasts large dams, most of them dragging ecological and social problems; Cahora Bassa Dam on the Zambezi is regarded according to Davies et al. (2000, p. 2) as the “least environmentally acceptable dam project in Africa”. Grand Ethiopian Renaissance Dam under construction triggered political and social movements both, in the damming country (Ethiopia) and downstream Egypt.

## 2.2. Colonial Inheritance

As dams that were built in Africa reflected the world political economy and power relations among main centers of world power specific to the second part of the last century, the colonial past determined – during the colonial era – and after it, the way water can be used, or abused, in Africa.

Water systems in Africa were designed and built by colonial centers with some specific peculiarities in mind: race, gender, geography and other elements of segregation were present in plans of colonizers in African colonies; related to access to water, Musemwa (2021) points that “infrastructure was designed to serve primarily White settlers while Africans living in segregated and overcrowded townships received limited amounts of water and sanitation services” (p. 27). Forty years after Zimbabwe's independence, the inherited unequal distribution patterns of water and sanitation manifests itself, too. Furthermore in Tanzania, Dar es Salaam repeats the same scenario: according to Bender (2021) this city is “a segregated urban space” with three concentric zones (p. 50); today it is the world's second fastest growing city with a population of over 6 million. And this is normal all over Africa. Colonizers settled the direction for water distribution, and consumption patterns, while native Africans had to comply...

If we go on further, development schemes in most African countries were realized in such a manner that health hazards have come with them and a lot of people felt on their bodies the “effects” of this top-down built civilization, as is indicated by [Livingston \(2021\)](#) and [Derr \(2021\)](#), who point to the fact that these actions haven’t taken into account the peculiarities of local/regional environment and how society was adapted to it.

Having these premises in mind, and the evolution of people living in African cities in the future, climate changes come to add a new layer of uncertainty, threatening lives and livelihoods, especially for those with low income; already the poor have disproportionately borne the impacts of climate crisis because of seasonal weather changes, waves of high temperatures, followed by floods and droughts ([McCarthy, 2020](#)).

### 3. HUMAN RIGHT TO WATER OR WATER’S COMMODIFICATION

Two opposing principles and frameworks stay here face-to-face. One regards water as a gift of divinity to serve and sustain all life on Earth, including humankind, the other says that the economy and market should moderate access to water, while pricing this good would contribute to a rising efficiency in its use and to its fair distribution. One is related to natural rights with its core element – life – and the other to neoliberal thinking, with its core elements: price and efficiency. One is related to common sense, the other to economic liberalization and free-market competition emanating from Chicago Schools and institutions such as the International Monetary Fund and the World Bank. He who has access to water – even if he must pay a price that is accessible for it – does not think too much (or at all) at these two different principles and possibilities, but one who must pay a *large* share of personal (family) income or spends a lot of *time* for getting access to water, sees things in a very different way.

As access to piped water is a luxury for a great part of native African city dwellers, private water vending has appeared as a solution and has become a marking part of the waterscape on the continent; but it comes with deleterious negative consequences: private water is *expensive*. The cost of water sold by vendors “can be as much as thirty times the price of water from a piped connection” ([Bayliss & Tukai, 2011, p. 18](#)). Prices vary very much depending on location, if fetching is necessary, and supply and demand, spiking during periods of scarcity. As a consequence, consumers in the poorest neighborhoods must pay the highest prices for access to needed water, and spend much time fetching it.

Lower water consumption per capita means poor sanitation and hygiene, posing great health risks, especially during rainy seasons, because of possible contamination of water sources from flood-water “invading” those poorly protected sources. Furthermore, in case one has a sick person in the family who lies in bed all the time, the excruciating question appears: should the so expensive water be used to clean the bed and wash the sick person, or save that water for drinking and cooking for the rest of the family? The greatest negative aspect of water’s private vending is the commodification of basic human rights; the most impacted is the poorest part of the urban population, perpetuating economic fault lines already existing and social inequalities. Even educational fulfillment can be strongly influenced by access to water: poor and expensive access means lower time and money for aspirants to education over the basic standards, further perpetuating social disparities.

If the availability of water is a more stringent issue in Middle Eastern countries than in Africa, being overcome through investments and facilitating access, in Africa the *scarcity* is at the

center of the water crisis, being connected to power relations, poverty, and inequality, and not to its physical existence. Rising population and rapid urbanization in Africa coupled with climatic shocks could generate great problems on the continent; climate changes can exacerbate already manifesting drawbacks: Africa has the greatest number of least-developed countries than any other continent, the poorest water infrastructure, and the highest proportion of population highly dependent on weather conditions as they live in the countryside. Specifying that on the African continent lives the largest pastoralist community on Earth – around 20% of its population (Verhoeven, 2021b, p. 260) – increasing disorderly precipitation patterns would be extremely stressful for it, and urban dwellers.

Migration towards urban centers in Africa is not a transitory phenomenon but one structured in the world political economy, African countries strive to develop and industrialize fast, their actions being promoted by their new supporters – China, India, and the Russian Federation. So, urbanization is not a transient phenomenon in Africa; it is influenced by birth rate and urban advantages versus rural poor development; but it could become unsustainable in case of quick and dramatic climatic shifts when rural and pastoralist populations would forcefully and chaos migrate towards the already overcrowded cities with an already poor water and sanitation infrastructure. Diseases, mass starvation, social upheaval, and dramatic political changes could be routine scenarios in some parts of the continent. In such a case it can be seen that the question related to mass migration inside Africa, and beyond its limits, towards an already fragile continent – Europe – could become a daunting reality.

In the past period colonial regime determined the way water infrastructure was conceived, while after gaining independence African countries had to strive with the requirements emanating from the International Monetary Fund's neoliberal doctrines where anything has a price based on market peculiarities, water being no exception. In a lot of countries cost recovery related to provided water, and the privatization of companies and services related to water have been contested and protests have taken place against such a policy, as it hasn't succeeded in delivering sufficient water to poor dwellers; Isaacman and Musemwa (2021) mentioned that “market-determined reforms within the water supply domain became one of the critical factors that helped create patterns of unequal access to water.” (p. 11).

As in other parts of the world, in African countries, there is a linkage between water commercialization and openness to world investors and companies activating in water areas in order to be *competitive* (another key-aspect of neoliberal doctrine) in a globalized economy, and the rising household number cut from the water system, especially in poorer areas, as a result of non-payment of bills. We can note that solely market-based solutions simply do not function in providing access to water for all the people – especially to the poorest – raising serious questions about the human right to a sufficient amount of water to ensure health and life quality. In some cities' poorer areas, the price of water can be four times as much as it costs in wealthy neighborhoods (Livingston, p. 94), while Adams et al. (2019, p. 248) mention that in “Nairobi, consumers pay ten times as much for vendor-delivered water than for water piped into private homes”.

So, the way access to water regarded as a human right, not as a marketable commodity, will be provided, will influence the stability and smooth working of African states and societies, but there is no unique solution for that. The solution must take into account not only economic development but also environmental protection, the river system's conservation, and cultural continuity for African communities.

## 4. POSSIBLE SOLUTIONS

A water crisis triggered by climate modifications looms over 25% of humankind; this will bring economic problems (poverty), natural problems (environmental breakdowns or degradation), and socio-political (weakening of already fragile governments). And the continent which has already strongly borne the effects of global warming is Africa; water insecurity has become an existential crisis for a lot of Africans and as [Isaacman and Musemwa \(2021\)](#) mention, nowadays around 1/3 of “Africa’s people live in regions prone to droughts and semi-aridity (p. 9); intensifying climate change has put the number of Africans at risk at 325 million.

Changing rainfall patterns have already negatively influenced the quantity of available water, nature fully feeling it, and people’s lives being stressful; food shortages have intensified as soil erosion manifested, while the spread of diseases overlaps this daunting scenario; mass migrations says [Yamba et al. \(2011, p. 620\)](#) are already common things in Africa.

What we can strongly affirm from the beginning is that there is no unique solution to cope with the stressful events we are expecting in Africa; climate change, rising population, and urbanization, coupled with inherited inequality in African society are and will remain pressing problems. As water is so important for energy, agriculture, industry and urban life, and for ecosystems, the way *local or regional solutions* related to its use and distribution are to be found, the more resilient society would be and the economic development would head on a sustainable path.

To cope with these negative phenomena one must not repeat the mistakes of the past; as in the past economic and technological aspects imposed solutions taken from top-down, in order to give a chance to sustainable development, the environment with its components and socio-cultural elements must take the center of the debate. Economic models should be included in a larger framework that should become eco-social, reuniting specialists from the economy, technology, hydrology, and specialists in public and livestock health, social and cultural areas and resource economics. All these reunited should think of projects which are best fitted from the local or regional point of view. Regional implications should be analyzed especially when it is about international river basins and when there are intended to be built storage capacities such as dams, whose storage capacity could harm hard downriver countries.

### 4.1. Ecological integrity

Having this on the decision’s desk means that the environment is no longer seen as being exploitable without any care, just to generate huge profits for a few, while the river per se and all which depends on its natural flow would support all negative influences. River development must take care of its natural flow pattern, life (of plants, animals, and fishes) it sustains, communities’ culture, and social patterns as they were determined by historical experiences directly influenced by that specific river; in case a river crosses national borders, smart decisions must take care of downriver riparian states. The environment and river’s water at large should not be seen as resources ready to be exploited, but as key support systems that are fast degrading.

### 4.2. Social equity

Access for all people at affordable costs should be the new framework for decision-making. As urban spaces expand, water infrastructure should be there, too, facilitating this expansion, but not

based on past thinking patterns with spatial (and water) segregation, but on a more equalitarian basis; access to water should become a key human right. Without such an approach, informal dwellings without connection to the water network will bear the brunt of costs related to the high price of water or time loss generated by fetching this vital resource, while deprivation brought upon by them will impede upward social mobility for a lot of people. In another way, the perpetuation of inequality with all that it means will be the main trait; in this case, one cannot speak about social equity.

### 4.3. Economic wealth

As a continent that boasts a dynamic population rise, having a remarkable spirit of adaptation, while in an economic field, some countries have good perspectives, Africa should create such a framework related to the availability of water that thinking about how a household should decide the way it uses water it can get, disappears. Water is central to life and to all economic activities; creating equitable access to water will contribute to the bill's value reduction (as a percentage of income), the remaining part of income being used for other goods and services, rising demand for them, possibly resulting in greater production capacity, higher incomes, lower unemployment, and much better economic perspectives.

## 5. CONCLUSION

We can already see and say we live in a world with water scarcity, especially in some areas, which in a lot of cases are the poorest; so the poor will bear the most negative impacts of climate changes reflected in lower water availability. Population dynamics, especially in those specific poor areas, seem to register spectacular growth in years to come; Africa is and will be at the intersection of water stress and rising population, with ever larger urban centers (formal and informal). If there are not found sustainable solutions for facile access to water in African countries, climate changes – which will only exacerbate these trends – will bring with it not only water stress but famine and diseases, which already are, unfortunately, part of normal life in a lot of African countries. Migration inside Africa and beyond its margins towards Europe can be a plausible scenario.

In order to prevent that, a new way of thinking is necessary, one that is different from that of the past where top-down decisions were taken by a few to the detriment of most people which had become after project fulfillment, societies in distress and prone to illnesses (mental or physical).

Bringing water from the countryside could be a solution that could be coupled with larger infrastructure projects (dams or dykes); successful water development projects must be found at the crossroads of formal and informal, connecting large-scale projects with small(er) projects which would be community-based. Community experiences based on the long history of those who lived in the countryside – and who have carried these experiences with them as collective memory – would bring more resilient solutions for future problems related to water stress and food shortages. Furthermore, differential use of water concerning its final use could be a sustainable solution in the years ahead; clean/bottled water could be used for drinking or cooking, used water could be used for irrigation, non-drinkable water could be used for washing toilets, sewage, clothing, house or car washing. The existence of multiple sourcing can be the key-element here: water networks providing homes with drinkable water brought from rivers' reservoirs or underground aquifers could be supplemented with boreholes and storage capacity for raining water, or with vending water. In case one source is not available, there could be other temporary options, but this *diversity* can make a great difference between thirst and how to quench it,

diminishing the possibility of diseases' spreading, avoiding social collapse and even contributing to economic performances' rising.

As we can see, Africans have a remarkable spirit of adaptation, and bringing in the decision-making process this experience from grass-root can generate better and more sustainable solutions.

## References

- Adams, E. A., Sambu, D., & Smiley, S. (2019). Urban Water Supply in Sub-Saharan Africa: Historical and Emerging Policies and Institutional Arrangements. *International Journal of Water Resources Development* 35(2), 240-263.
- Bayliss, K., & Tukai, R. (2011). *Services and Supply Chains: The Role of the Domestic Private Sector in Water Service Delivery in Tanzania*. New York, UNDP.
- Bender, M. V. (2021). Water for Bongo: Creative Adaptation, Resilience & Dar es Salaam Water Supply. *Daedalus*, 150(4), 48-63.
- Davies, B. R., Beilfuss, R., & Thoms, M. C. (2000). Cahora Bassa Retrospective, 1974-1997: Effects of Flow Regulation on the Lower Zambezi River, *Verhandlungen* 27 (4), 1-9.
- Derr, J. L. (2021). The Dammed Body: Thinking Historically about Water Security & Public Health. *Daedalus*, 150(4), 143-157.
- Isaacman, A., & Musemwa, M. (2021). Water Security in Africa in the Age of Global Climate Change. *Daedalus*, 150(4), 7-26.
- King, J., & Brown, K. (2021). Africa's Living Rivers: Managing for Sustainability. *Daedalus*, 150(4), 240-259.
- Livingston, J. (2021). Water Scarcity & Health in Urban Africa. *Daedalus*, 150(4), 85-101.
- McCarthy, J. (2020). Why Climate Change and Poverty Are Inextricably Linked, *Global Citizen*, <https://www.globalcitizen.org/en/content/climate-change-is-connected-to-poverty/> (July 5, 2023).
- Musemwa, M. (2021). Urban Struggles over Water Scarcity in Harare. *Daedalus*, 150(4), 27-47.
- Swain, A. (1997). Ethiopia, the Sudan, and Egypt: The Nile River Dispute. *The Journal of Modern African Studies*, 35(4), 675-694.
- Swyngedouw, E. (2004). *Social Power and the Urbanization of Water: Flows of Power*. Oxford, Oxford University Press.
- Tickner, D., Opperman, J. J., & Abell, R. (2020). Bending the Curve of Global Freshwater Biodiversity Loss: An Emergency Recovery Plan. *BioScience*, 70(4), 330-342.
- U.N.D.E.S.A. (2022). *World Population Prospects 2022. Summary of Results*. New York, United Nations.
- U.N.E.P. (2010). *Africa Water Atlas*. Nairobi, United Nations Environment Programme, Division of Early Warning and Assessment.
- Verhoeven, H. (2021a). The Grand Ethiopian Renaissance Dam: Africa's Water Tower, Environmental Justice & Infrastructural Power. *Daedalus*, 150(4), 159-180.
- Verhoeven, H. (2021b). Climate and Water in a Changing Africa: Uncertainty, Adaptation & Social Construction of Fragile Environments. *Daedalus*, 150(4), 260-276.
- Yamba, F. D., Walimwipi, H., Jain, S., & Zhou, P. (2011). Climate Change/Variability Implications on Hydroelectricity Generation in the Zambezi River Basin. *Mitigations and Adaptation Strategies for Global Change* 16(6), 617-628.
- Zdankus, N., Vaikasas, S., & Sabas, S. (2008). Impact of a Hydropower Plant on the Downstream Reach of a River, *Journal of Environmental Engineering and Landscape Management*, 16(3), 128-134.



# Decarbonization Initiatives among Leading Power Utility Players

Vlado Georgievski<sup>1</sup>   
Nevenka Kiteva Rogleva<sup>2</sup> 

Received: August 29, 2023  
Accepted: December 14, 2023  
Published: March 16, 2024

## Keywords:

Decarbonization;  
CO<sub>2</sub> reduction;  
Net-zero strategy;  
Power utilities



Creative Commons Non Commercial CC BY-NC: This article is distributed under the terms of the Creative Commons Attribution-Non-Commercial 4.0 License (<https://creativecommons.org/licenses/by-nc/4.0/>) which permits non-commercial use, reproduction and distribution of the work without further permission.

**Abstract:** Decarbonization of the power sector means a reduction of its CO<sub>2</sub> intensity, which reduces the emission of carbon dioxide per unit of electricity generated. In order to meet the emission reduction targets pledged to the Paris Agreement on climate change, power utility companies need to develop strategies on how to decarbonize their generation assets. Companies must achieve carbon neutrality by 2050, which is necessary to meet the targets of the Paris Agreement of capping global temperature rise at 1.5°C and to meet the less ambitious 2°C target. Rapid decarbonization of the power sector is needed particularly as heat and transport sectors are electrified, creating an increase in demand for electric power. Decarbonization is being achieved by increasing the share of low-carbon energy sources, particularly renewables, and a corresponding reduction in the use of fossil fuels. Worldwide, renewables now produce a third of power capacity.

## 1. INTRODUCTION

Decarbonizing the power generation sector is essential for achieving the Net Zero target and carbon neutrality by 2050. However, the measures required vary by region and country. Asian utilities must focus on decarbonizing coal assets, while Europe, North America, and the Middle East should prioritize gas. Developing economies face the challenge of decarbonizing young fleets while also tackling electrification and energy independence. CO<sub>2</sub> prices are continuously rising, leaving utilities with no choice but to prepare for change today. There are various methods to decarbonize fossil generation assets, but none are ideal due to high costs, technology limitations, and operational changes. This paper analyzes different decarbonization levers, energy crises, and rising energy prices, and benchmarks decarbonization initiatives by selected power utilities players in specific regions. Finally, a deep dive into the techno-economic analysis of switching from natural gas to hydrogen as a decarbonization lever will be presented.

## 2. SECTION SNIPPETS

### 2.1. Literature Survey

The literature pertaining to the subject matter can be categorized based on the scope of the relevant studies. In Sections 3 and 4, we provide a review of recent studies that focus on decarbonization technologies implemented across all fossil fuel types. However, these decarbonization levers are presented in a broader sense to suit real-world scenarios. In Section 5, a benchmark research study of major power utility companies was undertaken to analyze current decarbonization initiatives and projects. Each company was scanned by checking its website

<sup>1</sup> Faculty of Electrical Engineering and Information Technologies, “Ss. Cyril and Methodius” University in Skopje, Rugjer Bošković bb, P.O. Box 574, 1001 Skopje, Republic of North Macedonia

<sup>2</sup> Faculty of Electrical Engineering and Information Technologies, “Ss. Cyril and Methodius” University in Skopje, Rugjer Bošković bb, P.O. Box 574, 1001 Skopje, Republic of North Macedonia

announcements and other relevant news portals such as Factiva, Bloomberg, and S&P Global Intelligence. In this paper, a selection of 13 power utility companies is presented and results are discussed. In Section 6, a more detailed analysis of one lever - gas to hydrogen - is undertaken, including an assessment of the technological possibilities and costs. Studies and articles from global OEMs are drawn upon in this section, providing an analysis of the current status of hydrogen gas turbines.

## 2.2. Methodology and Model Description

The primary objective of this study is to scrutinize the multifaceted technological methodologies for decarbonizing power generation facilities, with a focus on their distinct technological and cost-oriented characteristics. A comprehensive summary of the outcomes obtained from benchmark analyses of various companies has been compiled into a tabulated format, followed by an insightful discourse highlighting the decarbonization approaches across three major regions, namely the USA, EU, and Asia, along with the rest of the world (RoW). In addition, for the gas to hydrogen deep dive, a computational model was constructed in Microsoft Excel to assess the financial and carbon emission implications of each lever, spanning the period from 2020 to 2050. The model calculates the costs associated with investment and power generation, as well as the resulting CO<sub>2</sub> emissions for each fossil technology, in addition to the costs and carbon abatements achievable by implementing different decarbonization levers.

In this model, commodity prices and cost assumptions from several global sources are used but mostly rely on data by IEA and EIA. We use forecasted regional fuel price assumptions, and CO<sub>2</sub> emissions from the IEA WorldEnergyOutlook 2021.

## 3. DECARBONIZATION LEVERS IN POWER GENERATION

According to [Davis et al. \(2018\)](#) and [Zhang et al. \(2022\)](#), “there are two different approaches for decarbonizing existing fossil fuel power plants: fleet-level system and plant-level analysis.” Both of them are based on the technical feasibility and economics of fossil fuel power decarbonization, but plant-level analysis usually takes in more detailed input parameters, thus resulting in more practical solutions for selected plants. Five different categories of decarbonization levers will be analyzed in this paper:

1. Operations improvement and equipment modernization,
2. Co-firing with low carbon fuels,
3. Retrofit for full fuel switch,
4. Implementation of CCUS,
5. Shutdown of fossil assets and building new plants.

### 3.1. Operations Improvement and Equipment Modernization

Power plants are designed to last between 25 and 35 years, but many countries extend the life of plants to 40 years or more due to economic reasons. It's not cost-effective to retire plants prematurely. Refurbishing boiler parts, upgrading turbines, and adding flue gas cleaning can help extend the life of a plant and meet new emission regulations.

“One example is drying of coal and lignite that leads to certain efficiency improvement”, according to [Pawlak-Kruczek et al. \(2019\)](#) and [Sarunac et al. \(2014\)](#).



### 3.2. Co-firing with Low Carbon Fuels

Co-firing with low carbon fuels refers to the simultaneous combustion of a low carbon fuel and a base fuel to produce energy. Here it is analyzed co-firing coal with biomass or green ammonia, and co-firing gas with green hydrogen.

#### 3.2.1. Co-firing Coal with Biomass

“Biomass utilization in power generation is considered carbon-neutral owing to the atmospheric CO<sub>2</sub> removal capability of biomass” (Zhang et al., 2022). “Biomass co-firing in coal power plants (up to 30%) has been proved possible without largely modifying the existing infrastructure” (Wang et al., 2021). Biomass co-firing involves burning biomass with coal in coal-fired power plants, which can increase the use of biomass and reduce greenhouse gas emissions. Co-firing has advantages over power plants that burn 100% biomass, such as lower capital costs, higher efficiency, and lower electricity costs. “The net electric efficiency of co-fired plants ranges from 36-44%, depending on plant technology, size, quality and share of biomass. While up to 50% co-firing is technically achievable, the usual biomass share is below 5%. Higher biomass shares result in lower emissions, and 1-10% co-firing could reduce CO<sub>2</sub> emissions by 45-450 million tons per year by 2035” according to (IEA, 2014), if upstream emissions are not included.

#### 3.2.2. Co-firing Coal with Ammonia

Ammonia co-firing is the process of burning ammonia with coal in coal-fired power plants. The research of (Tamura et al., 2020) “on a 1.2 MW coal-fired furnace showed that when NH<sub>3</sub> and coal were mixed in the burner, the NO<sub>x</sub> emission did not go up until the NH<sub>3</sub> ratio of 30%. The Japanese Chugoku Electric Power Corporation successfully demonstrated co-firing with a 1% share of ammonia in 2017”. “Concerns about increased NO<sub>x</sub> emissions were addressed, and higher blending shares of up to 20% ammonia may be feasible with minor adjustments to a coal plant. In Japan, blending shares of 20% have been achieved without problems in smaller furnaces. Technical feasibility has been proven since 2017, with IHI and Chugoku Electric testing 20% ammonia co-firing in a 156 MW plant. IHI demonstrated the co-firing of ammonia and coal with a fuel mix of 20% ammonia in 2018” (IEA, 2014). “While the co-firing concept is mostly limited to Japan, it could have near-term global relevance on the supply side”, according to Crolus (2019).

#### 3.2.3. Co-firing Gas with Hydrogen

Hydrogen firing technology allows power plant owners to decarbonize their Combined Cycle Gas Turbine (CCGT) plants by converting them to hydrogen co-firing or 100% hydrogen firing in the future, playing a key role in the decarbonization of the energy sector. Natural gas with hydrogen from the chemical industry is emerging as a key fuel for burning in gas turbines. “While NO<sub>x</sub> emissions increase with higher H<sub>2</sub> percentages, the increase is orders of magnitude lower compared to conventional diffusion burners, and flashback risks are similar to liquid fuels. Flame speed is ten times higher than natural gas, and compact flames in DLE burners lead to a slight NO<sub>x</sub> increase. EnergyAustralia's co-firing project with GE's advanced gas turbines is set to start commercial operations in 2023/2024”, according to Goldmeer (2019).

### 3.3. Retrofit for Full Fuel Switch

“Retrofitting is the process of modifying existing systems with new technology or features, such as improving the efficiency of power plants, increasing output, or reducing emissions. Retrofitting a significant fraction of existing coal-fired power plants is likely to be an important part of a global rollout of carbon capture and storage” (Sanchez del Rio et al., 2017). For plants suited for a retrofit, the energy penalty for post-combustion carbon capture can be minimized by effective integration of the capture system with the power cycle. This paper analyzes retrofit in the aspect of using an existing coal or gas power plant with adjustments to accommodate new fuel types. Different fuel retrofits are possible: coal to biomass, waste or natural gas, and gas to green hydrogen.

#### 3.3.1. Retrofit Coal to Biomass and Coal to Gas

“Large coal power plants can convert to biomass through the use of new mills and burners specifically designed for biomass fuels, with wood pellets being the standard choice due to their high energy density and technical advantages”, based on research by IEA-ETSAP & IRENA© Technology Brief E21 (2013) and Biofit Factsheet Coal Conversions (2020). These converted plants require huge amounts of biomass, often secured through imports, and full fuel switching to biomass can significantly reduce CO<sub>2</sub> emissions.

“As a consequence of an impending carbon tax, power companies might well set performance targets to be met by individual power plants” (IEA, 2014).

“Compared to coal power plants, natural gas plants are highly space-efficient, as they require less land area and leave no ash when combusted”, according to (Qvist et al., 2021). They also say that retrofitting existing coal plants with natural gas boilers and carbon capture is possible, but only for plants close to natural gas pipelines.

#### 3.3.2. Retrofit Gas to Hydrogen

On-site sorbent enhanced steam reforming of natural gas into hydrogen can reduce carbon emissions by up to 98% without expensive carbon capture systems. Siemens Energy is developing two gas turbine packages for the Leipzig Süd district heating power plant to eventually run on 100% hydrogen, while the Hydrogen-to-Magnum Project aims to convert a Vattenfall power plant gas turbine to run on 100% hydrogen by 2027 using a Mitsubishi M701F turbine. The main challenge of hydrogen combustion is flashback risk due to its rapid combustion speed.

### 3.4. Implementation of CCUS

CCS enables significant reductions in CO<sub>2</sub> emissions from fossil fuel industries like coal-fired power plants. It involves capturing and compressing CO<sub>2</sub>, transporting it, and either storing or utilizing it. However, all CCS options have costs and reduce plant efficiency, requiring additional capital investment for equipment and infrastructure. CO<sub>2</sub> capture also requires more energy and fuel, making it most effective in high-efficiency plants with integrated capture processes. Retrofitting existing plants requires adequate space and nearby CO<sub>2</sub> storage sites. Capital costs are expected to decrease with widespread deployment.

“Carbon capture capacity poised to surge more than 10 times by 2030, but aggressive investment needed to meet mid-century targets” (Rystad Energy, 2022).

“Based on learnings from current developments and expected economies of scale, CCUS project cost is anticipated to range between \$75-\$100 per ton of CO<sub>2</sub> captured by 2030, meaning the total market value of the sector could reach \$55 billion annually by 2030” (Qvist et al., 2021).

### 3.5. Shutdown of Fossil Assets and Building New Plants

This lever has multiple sublevers capturing all the possible variations but is based on decommissioning existing coal or gas-fired plants and replacing it with a plant with less or zero CO<sub>2</sub> emissions. Some of the variations for coal-fired power plants are as follows: 1. Coal to Gas, 2. Coal to Gas + CCS, 3. Coal to PV, 4. Coal to PV+Wind, 5. Coal to PV+Wind+Battery. The same levers can apply to gas fired power plants: 1. Gas to PV, 2. Gas to PV + Wind, 3. Gas to PV + Wind + Battery, 4. Gas to 100% Hydrogen.

These methods typically require higher upfront CAPEX to build a new plant or invest in renewable parks. The levers are more market-competitive in countries with very high CO<sub>2</sub> and gas prices.

## 4. 2022 ENERGY PRICES ACCELERATING THE NEED FOR DECARB PATHWAY

“The European Union first proposed a cap on the price of gas and electricity in March, after energy prices took off when Russian – Ukraine conflict started. While some suppliers produce their energy, most of the price that electricity firms pay is set by financial markets, where producers, utility firms and speculators compete based on supply and demand” (Nik, 2022).

“Electricity producers are paid the same price despite having vastly different expenditures. Gas power stations are much more expensive to run than wind or solar farms and, therefore, tend to set the overall market price” (Nik, 2022).

“Current German import prices reaching above 400 EUR/MWh for natural gas and above 580 EUR/MWh for coal (July 2022)” (Statistisches Bundesamt, 2022) “were the factors for the year-ahead contract for German electricity reaching €995 (\$995) per megawatt hour at the end of August” (Nik, 2022).

Moreover, with CO<sub>2</sub> prices also being currently high (65 EUR/ton, Sep/2022) (Statistisches Bundesamt, 2022) and expected to double in the next decade (111 EUR/ton, Dec/2030), power utilities not only need to set a decarbonization strategy, but also rapidly accelerate it, in order to prevent and slow down the gradual elimination of fossil assets.

## 5. BENCHMARK RESEARCH ON COMPANY DECARBONIZATION INITIATIVES

A research study analyzed various factors and identified key strategies employed by 13 selected companies in their ongoing or planned decarbonization initiatives (Table 1). The companies were selected from different regions including the US, Europe, Asia, and the rest of the world. Utilities in Europe and the US are prioritizing the shift from coal to renewables in their immediate plans. The companies analyzed in the study include Duke Energy, Next Era, Evergy, Fortum, Uniper, Engie, Enel, RWE, Orsted, CLP, NTPC, Tepco, and Eskom.

**Table 1.** Decarbonization Initiatives across Major Power Utilities

Region	Company	Power Plant Actions			Diversifying from fossil fuel			Carbon Capture
		Coal to Gas	Coal to Biomass	Coal Di-vestment	PV and Wind	Energy Storage	Ammonia, H2	CCS
US based	Duke Energy	○	○	●	●	●	●	●
	NextEra	●	○	●	●	●	●	○
	Evergy	○	○	●	●	○	○	○
EU based	Fortum	○	●	●	●	●	●	○
	Uniper	●	○	●	●	●	●	○
	Engie	○	●	●	●	●	●	●
	Enel	○	○	●	●	●	●	○
	RWE	○	●	●	●	●	●	○
	Orsted	○	○	●	●	●	●	●
Asia and RoW based	CLP	○	○	○	●	○	●	○
	NTPC	○	○	●	○	○	●	●
	Tepeco	○	○	○	●	●	●	○
	Eskom	○	○	○	●	●	●	○

Legend: ○ No evidence of investing; ● Testing; ● Investing

Source: Own research

### 5.1. Results and Discussion

**USA:** Based on this study of three major power utility companies in the US: Duke Energy, Next Era and Evergy, it was found that the shift from coal to natural gas was primarily driven by lower natural gas prices and the flexibility of gas-fired power plants to ramp up and down quickly to accommodate intermittent renewable energy sources. While the companies were also investing in renewable energy, the cheaper cost and availability of natural gas made it a more attractive option for meeting the increasing electricity demand. However, the companies recognized the need to further diversify their energy mix to reduce reliance on any single fuel source and mitigate potential future price fluctuations.

**Europe:** Based on our analysis of six European power utility companies - Uniper, RWE, Fortum, Engie, Enel, and Orsted - the primary driver for phasing out coal and investing in renewables, storage, and hydrogen is the strong environmental regulations in the European Union. Unlike in the United States, natural gas is not as abundant and cheap in Europe, making it less economically attractive as an alternative to coal. Additionally, the decreasing costs of renewables and energy storage technologies, along with supportive government policies and targets, have made them more competitive compared to fossil fuels. As a result, these six power utility companies are actively investing in renewable energy sources, energy storage, and green hydrogen as part of their decarbonization initiatives.

While these initiatives present opportunities, there are also risks involved, including potential project delays and cost overruns, technological limitations, and uncertain policy and regulatory environments.

**Asia:** Our analysis of power utilities in Asia shows that the shift towards hydrogen and ammonia as clean energy sources is driven by their potential to reduce greenhouse gas emissions, dependence on imported fossil fuels, and economic opportunities. Regulatory pressure to reduce

emissions, combined with ambitious decarbonization targets in countries such as Japan, is driving investment in these technologies. TEPCO, a major power utility in Japan, is among those exploring and investing in hydrogen and ammonia as part of its decarbonization strategy. Additionally, Japan has a well-developed technology and infrastructure for hydrogen production, storage, and transportation. As of 2021, Japan is the world's largest importer of liquefied natural gas (LNG) and has already begun importing hydrogen and ammonia as part of its energy transition strategy. Furthermore, Japan has set a target to increase its use of hydrogen to 20% of its energy mix by 2050.

## 6. DEEP DIVE – GAS TO HYDROGEN

To power an energy ecosystem with H<sub>2</sub>, large volumes of the fuel will need to be generated. Goldmeer (2019) and Energy et al. (2019), discuss two available methods for generating large volumes of H<sub>2</sub>, which are steam methane reforming and electrolysis of water. While steam methane reforming is the main production method for H<sub>2</sub> today, it generates CO<sub>2</sub>, making carbon capture technologies necessary to achieve a carbon-free ecosystem. “Meanwhile, using electrolysis to generate the necessary volumes of H<sub>2</sub> will require significant energy, potentially increasing costs. However, an alternative solution is to generate H<sub>2</sub> from electrolysis using excess renewable energy, or “green H<sub>2</sub>”, according to Energy et al. (2019). This approach represents a paradigm shift in power generation and could help reduce the curtailment of excess renewable power. The paper's deep dive examines the potential for using H<sub>2</sub> in gas turbines to support a low-carbon or carbon-free energy ecosystem.

### 6.1. Gas Turbine Experience with Hydrogen

“Hydrogen can be used as a fuel for power generation, and gas turbines are capable of operating on it, making it suitable for a range of industrial applications such as steel mills, refineries, and petrochemical plants”, according to Goldmeer (2019). “Several gas turbine manufacturers have developed turbines that can operate on fuels containing hydrogen, with some units accumulating over one million operating hours. In cases where there is not enough hydrogen available, a blend of hydrogen and natural gas can be generated, which can be utilized with traditional dry low NO<sub>x</sub> (DLN) combustion systems. This has already been implemented at sites such as Dow Plaquemine plant in the USA and the Gibraltar-San Roque refinery in Spain, with the latter having operated more than 9,000 hours on a blend of hydrogen and natural gas as of 2015”, says Goldmeer (2019).

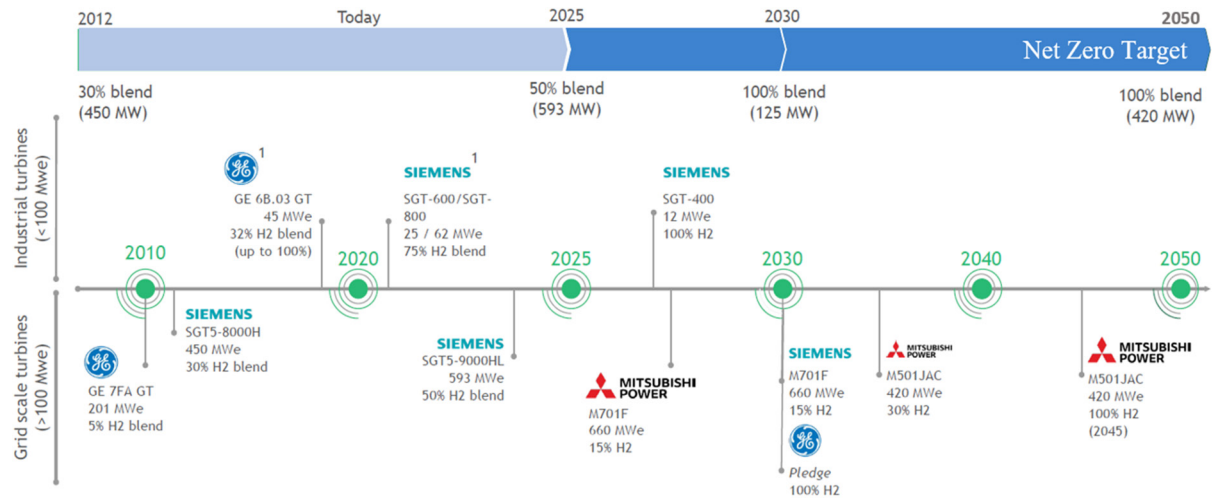
Table 2 presents the findings from the research and analysis conducted on the technological and capital expenditure (capex) requirements associated with hydrogen fuel blending.

### 6.2. Complete Fuel Switch from Gas to Hydrogen

Based on the available data from OEM companies and research reports, it can be concluded that the current status of CCGT turbines being able to operate on hydrogen blends or full hydrogen is promising. Major turbine manufacturers (Fig.1) such as GE, Siemens, MHPS, and Ansaldo have already pledged support to develop new H<sub>2</sub>GTs capable of burning 100% hydrogen at similar efficiencies to current CCGTs and very low NO<sub>x</sub> emissions, which would not require additional capture plants. EU Turbines, an association of the EU steam and gas turbine sector, has also committed to providing turbines capable of burning 100% hydrogen by 2030.

While the cost of building new CCGT plants that are hydrogen-ready may be slightly higher, it would enable the plants to operate on a blend of hydrogen in the future without any significant Capex investment. The availability of H2GTs is paramount for a future with hydrogen and requires continued R&D support from turbine manufacturers to overcome current technical barriers.

Overall, the potential of using hydrogen as a fuel for CCGT turbines is a promising step towards a greener future. It has the potential to significantly reduce carbon emissions while ensuring reliable and efficient power generation.



<sup>1</sup> Industrial Gas Turbine

**Figure 1.** Timeline of selected projects with hydrogen fuels

Source: Georgievski & Kiteva, 2022

However, a comprehensive approach is required that involves not only technological advancements but also supportive policies, regulations, and investments in infrastructure to fully realize the potential of hydrogen as a fuel for power generation, according to Goldmeer (2019) and Energy et al. (2019).

**Table 2.** Technology and Capex Requirements for Hydrogen Fuel Blend

	Hydrogen blend (% of volume)		
Requirement for add. investments/modifications	ca. 0-15%	ca. 15-30%	ca. 30-100%
1. Fuel accessory system <sup>1</sup>	●	●	●
2. Gas turbine combustion system		●	●
3. Gas turbine enclosure <sup>2</sup>		●	●
4. Selective Catalytic Reduction <sup>3</sup>		●	●
5. Gas turbine controls		○	●
6. Safety system	○	●	●
7. Heat recovery system		○	●
	Minor CAPEX		Significant CAPEX ~ 200-500 \$k/MW <sup>1</sup>
○ Potentially required ● Required			

<sup>1</sup> Assumed that CAPEX of new CCGT is ~1000k\$/MW (EIA, 2020)

Source: Energy et al., 2019; own processing

### 6.3. Technological and CAPEX Requirements

Based on research analyses of multiple articles and studies from original equipment manufacturers, the technological and capital expenditures (CAPEX) requirements for blending hydrogen and retrofitting gas turbines vary depending on the percentage of hydrogen blended with natural gas.

**Blending up to 30% hydrogen:** Blending up to 30% hydrogen requires minor modifications to existing gas turbines. The main technological requirements include upgrading the fuel system to accommodate hydrogen, replacing some components with hydrogen-resistant materials, and installing additional sensors and monitoring equipment to ensure safe and efficient operation. The CAPEX investment for this process is up to 5% of the cost of a new gas turbine.

**Blending up to 50% hydrogen:** Blending up to 50% hydrogen requires more significant modifications than blending up to 30% hydrogen. The technological requirements include upgrading the fuel system to accommodate higher hydrogen concentrations, replacing more components with hydrogen-resistant materials, and improving the combustion system to optimize combustion efficiency and reduce emissions. The CAPEX investment for this process is between 5% and 10% of the cost of a new gas turbine.

**Blending up to 100% hydrogen:** Retrofitting gas turbines to run on 100% hydrogen requires significant modifications to the turbine and combustion system. The technological requirements include replacing or upgrading the entire fuel system, including storage and handling equipment, and retrofitting the combustion system to optimize hydrogen combustion efficiency and reduce emissions. The CAPEX investment for this process is between 30% and 50% of the cost of a new gas turbine.

## 7. CONCLUSION

The number of countries announcing pledges to achieve net zero emissions over the coming decades continues to grow. But the pledges by governments to date – even if fully achieved – fall well short of what is required to bring global energy-related carbon dioxide emissions to net zero by 2050 and give the world an even chance of limiting the global temperature rise to 1.5 °C.

Based on the companies' decarbonization initiatives, we can conclude that Europe and US are phasing out coal and investing in renewables and low-carbon technologies, Japan is focusing on green hydrogen and ammonia solutions, while India, Africa, and China still need to push the coal phase out strategy further and focus on investing into low carbon generation.

Moreover, with the impact of current energy crises and soaring energy prices, power utilities (especially EU-based), will need to accelerate the phase out of their coal and lignite assets and decommission all their fossil fueled assets by 2050 in order to meet the requirements of the Paris Agreement and save the planet from irreversible climate catastrophe. With coal phasing out in 2030 in most EU countries, and gas being a costly option, investments in renewables and low-carb technologies will be inevitable.

## References

- Biofit Factsheet Coal Conversions. (2020). *Coal to Biomass Conversions*. [https://www.biofit-h2020.eu/publications-reports/Biofit-Factsheet\\_CoalConversions.pdf](https://www.biofit-h2020.eu/publications-reports/Biofit-Factsheet_CoalConversions.pdf)
- Crolius, S. H. (2019, July 18). *The Evolving Context of Ammonia-Coal Co-Firing*. <https://www.ammoniaenergy.org/articles/the-evolving-context-of-ammonia-coal-co-firing/>
- Davis, S. J., Lewis, N. S., Shaner, M., Aggarwal, S., Arent, D., Azevedo, I. L., Benson, S. M., Bradley, T., Brouwer, J., Chiang, Y. M., Clack, C. T. M., Cohen, A., Doig, S., Edmonds, J., Fennell, P., Field, C. B., Hannegan, B., Hodge, B. M., Hoffert, M. I., ... Caldeira, K. (2018). Net-zero emissions energy systems. In *Science* (Vol. 360, Issue 6396). American Association for the Advancement of Science. <https://doi.org/10.1126/science.aas9793>
- EIA. (2020). *Capital Cost and Performance Characteristic Estimates for Utility Scale Electric Power Generating Technologies*. [https://www.eia.gov/analysis/studies/powerplants/capital-cost/pdf/capital\\_cost\\_AEO2020.pdf](https://www.eia.gov/analysis/studies/powerplants/capital-cost/pdf/capital_cost_AEO2020.pdf)
- Energy, E., Andersen, S. H., Sadler, D., & Sotiropoulos Michalakakos, T. (2019). *Hy-Impact Series Hydrogen in the UK, from technical to economic*. <https://www.element-energy.co.uk/wordpress/wp-content/uploads/2019/11/Element-Energy-Hy-Impact-Series-Summary-Document.pdf>
- Georgievski, V., & Kiteva, R. N. (2022, September 23). Decarbonization initiatives among leading power utility players. *Conference Proceedings / International Conference "Energetics 2022."* <https://zemak.mk/zbor-dva-za-megunarodnata-konferencija-energetika-2022/>
- Goldmeier, J. (2019). *Power to Gas: Hydrogen for Power Generation*. [https://www.ge.com/content/dam/gepower/global/en\\_US/documents/fuel-flexibility/GEA33861%20Power%20to%20Gas%20-%20Hydrogen%20for%20Power%20Generation.pdf](https://www.ge.com/content/dam/gepower/global/en_US/documents/fuel-flexibility/GEA33861%20Power%20to%20Gas%20-%20Hydrogen%20for%20Power%20Generation.pdf)
- IEA. (2014). *Emissions Reduction through Upgrade of Coal-Fired Power Plants*. <https://www.iea.org/reports/partner-country-series-emissions-reduction-through-upgrade-of-coal-fired-power-plants>
- IEA-ETSAP, & IRENA© Technology Brief E21. (2013). *Biomass Co-firing*. <https://www.irena.org/-/media/Files/IRENA/Agency/Publication/2013/IRENA-ETSAP-Tech-Brief-E21-Biomass-Co-firing.pdf>
- Nik, M. (2022, August 30). *Energy crisis: Can the EU tame soaring prices?* <https://www.dw.com/en/energy-crisis-can-the-eu-tame-soaring-prices/a-62960012>
- Pawlak-Kruczek, H., Czerep, M., Niedzwiecki, L., Karampinis, E., Violidakis, I., Avagianos, I., & Grammelis, P. (2019). Drying of Lignite of Various Origins in a Pilot Scale Toroidal Fluidized Bed Dryer using Low Quality Heat. *Energies*, 12(7). <https://doi.org/10.3390/en12071191>
- Qvist, S., Gładysz, P., Bartela, Ł., & Sowizdzał, A. (2021). Retrofit decarbonization of coal power plants—A case study for Poland. *Energies*, 14(1). <https://doi.org/10.3390/en14010120>
- Rystad Energy. (2022, April 26). *Carbon capture capacity poised to surge more than 10 times by 2030, but aggressive investment needed to meet mid-century targets*. <https://www.rystadenenergy.com/newsevents/news/press-releases/carbon-capture-capacity-poised-to-surge-more-than-10-times-by-2030-but-aggressive-investment-needed-to-meet-mid-century-targets>
- Sanchez del Rio, M., Gibbins, J., & Lucquiaud, M. (2017). On the retrofitting and repowering of coal power plants with post-combustion carbon capture: An advanced integration option with a gas turbine windbox. *International Journal of Greenhouse Gas Control*, 58, 299–311. <https://doi.org/10.1016/j.ijggc.2016.09.015>
- Sarunac, N., Ness, M., & Bullinger, C. (2014, November 1). *Improve Plant Efficiency and Reduce CO2 Emissions When Firing High-Moisture Coals*. <https://www.powermag.com/improve-plant-efficiency-and-reduce-co2-emissions-when-firing-high-moisture-coals/>



- Statistisches Bundesamt. (2022, September 9). *Statistisches Bundesamt (Destatis)*. <https://www.destatis.de/>
- Tamura, M., Gotou, T., Ishii, H., & Riechelmann, D. (2020). Experimental investigation of ammonia combustion in a bench scale 1.2 MW-thermal pulverised coal firing furnace. *Applied Energy*, 277, 115580. <https://doi.org/10.1016/j.apenergy.2020.115580>
- Wang, R., Chang, S., Cui, X., Li, J., Ma, L., Kumar, A., Nie, Y., & Cai, W. (2021). Retrofitting coal-fired power plants with biomass co-firing and carbon capture and storage for net zero carbon emission: A plant-by-plant assessment framework. *GCB Bioenergy*, 13(1), 143–160. <https://doi.org/10.1111/gcbb.12756>
- Zhang, C., Zhai, H., Cao, L., Li, X., Cheng, F., Peng, L., Tong, K., Meng, J., Yang, L., & Wang, X. (2022). iScience Understanding the complexity of existing fossil fuel power plant decarbonization. *ISCIENCE*, 25, 104758. <https://doi.org/10.1016/j.isci>





# Trends in Hydrogen Production Projects for Energy and Climate Purposes – A Descriptive Analysis of the IEA Database

Elena Ocenic<sup>1</sup> 

Received: August 28, 2023

Accepted: November 1, 2023

Published: March 16, 2024

## Keywords:

Hydrogen production;  
IEA database;  
Energy and climate



Creative Commons Non Commercial CC BY-NC: This article is distributed under the terms of the Creative Commons Attribution-Non-Commercial 4.0 License (<https://creativecommons.org/licenses/by-nc/4.0/>) which permits non-commercial use, reproduction and distribution of the work without further permission.

**Abstract:** *This paper analyses the global project database on hydrogen production from the International Energy Agency (IEA), comprising 1477 projects for energy and climate purposes. Through quantitative analysis and data visualization, the research centers on renewable-powered hydrogen projects, encompassing various production methods. Across 80 countries, Germany, Australia, and the United States exhibit the most projects (182, 118, 114). Most of the projects are in developmental stages, with 35% undergoing feasibility studies, 23% in concept stages, and 15% operational. Notably, 66 operational projects are renewable-powered, Germany leading with 19, followed by China (8), Great Britain, and Spain (4 each). Technologies include proton exchange membrane electrolysis, alkaline electrolysis, and others. This work underscores global hydrogen production efforts, spotlighting countries pioneering renewable-driven facilities for this energy carrier.*

## 1. INTRODUCTION

There is momentum building around the hydrogen production technologies for several reasons, including the development of several national and regional hydrogen strategies around the globe, technological enhancement observed in recent years, important cost reduction (especially regarding the input renewable electricity generation technologies), more derivative products of hydrogen available at large scale (e.g. ammonia), its importance for climate change mitigation, as well as the acknowledgment that so-called clean energy (understood often as power or electricity) is not sufficient to meet the Paris Agreement (United Nations, 2015).

Based on previous work of the author (Ocenic & Tantau, 2023), this paper focuses on the hydrogen produced thanks to renewable energy sources, i.e., „green” hydrogen, with the purpose of decarbonizing economies and contributing to the overarching global climate agenda. In this context, „green” hydrogen plays a key role in the decarbonisation of so-called „hard-to-decarbonize” sectors of the global economy, like iron and steelmaking, cement, chemicals and petrochemicals, transport, as well as heating and cooling in buildings (IRENA, 2020).

## 2. LITERATURE REVIEW

Previous research has looked into the hydrogen project database put together by the International Energy Agency (IEA) (James & Menzies, 2022; Pleshivtseva et al., 2023), but with a different scope, and the database has evolved since their analysis was performed. For example, fewer projects were included in these analyses, compared to the present one.

<sup>1</sup> Bucharest University of Economic Studies, Faculty of Business Administration in Foreign Languages, Piața Romană 6, București, 010374, Romania

Regarding the method chosen, descriptive statistics are recommended for researchers to understand the data they are analysing, before conducting a more thorough analysis, for example performing inferential statistics (Grech, 2018). More precisely, exploratory analyses have been performed before in infrastructure projects, such as transport (Mathur et al., 2021) and other socio-economic topics, like household savings (Cuomo et al., 2023).

Moreover, Excel has been used in scientific research before and it is not necessarily a novelty, although it was seen as a *key tool for future research in improving the utilization of information across organizations*, given the capabilities of Pivot Tables, Pivot Charts (Palocsay et al., 2010, p. 191).

### 3. RESEARCH METHODOLOGY

The research objective of the present paper is to analyze the international project database on hydrogen production facilities which is collected by the IEA and made available publicly after registering on their dedicated website (IEA, 2022). The full database was downloaded on 12 May 2023, so this is considered the cutting point, after which any other updates of the database are not taken into consideration for consistency and accuracy of the analysis throughout the publication process of the present paper.

The quantitative analysis performed on the data available is focused on projects dedicated to hydrogen production powered by renewable energy. As such, descriptive statistics for data analysis are employed, as well as quantitative methods to examine key trends and emerging leaders in hydrogen project development around the globe. Moreover, data visualisation is being employed for a global mapping of projects, which helps understand the project distribution around the world.

Overall, the IEA database contains approximately 1500 projects from around the world. The projects have various categories listed, of which the most relevant for the present analysis are the development stage of the projects (e.g., feasibility study, concept stage, operational, demonstration, etc.), as well as the technology employed (e.g. alkaline electrolysis, proton exchange membrane electrolysis, solid oxide electrolysis cells and other/unknown) and the energy source used in the hydrogen production process.

Additionally, a country analysis is being performed by looking at the distribution of projects per country, which provides insights into whether there are any existing and/or emerging leaders when it comes to hydrogen production facilities (either planned or already operational). In addition to the energy used in the process, the technology employed both for operational and under-development projects is being analyzed to understand the key market trends concerning „green” hydrogen production.

The analytical steps taken are the following:

- Step 1:** Download the data (Microsoft Excel).
- Step 2:** Format the headings in the database.
- Step 3:** Create Pivot Tables of the entire database.
- Step 4:** Analyse the data for selected variables (e.g., country, count of projects, status, type of electricity, count of projects, etc.) via Pivot Tables.
- Step 5:** Visualize results using Pivot Charts and embedded maps.

## 4. FINDINGS

### 4.1. Leading countries today are likely to be leaders tomorrow

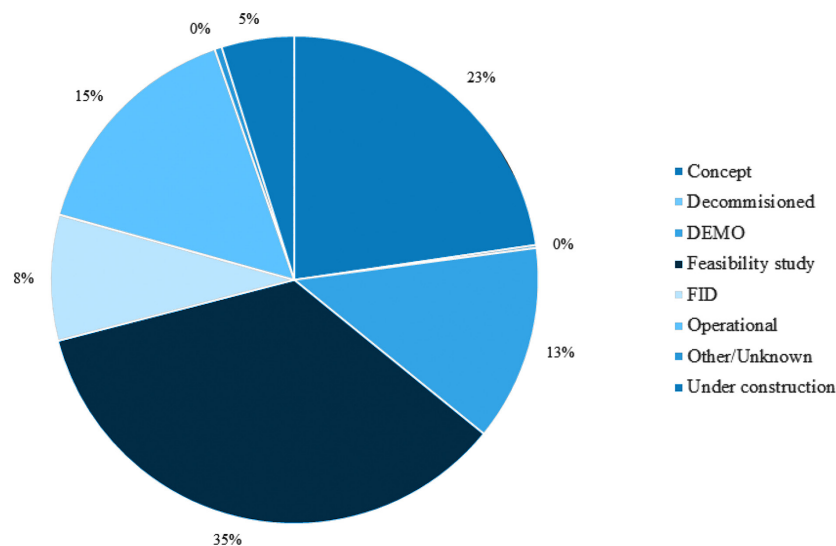
Table 1 shows the leading countries with the highest number of hydrogen projects included in the database. Germany, Australia, and the United States of America have the highest number of operational and planned projects, 182, 118, and 114 respectively.

**Table 1.** Countries with the most hydrogen projects in the IEA database

Country	Number of projects
Germany	182
Australia	118
United States of America	114

Source: Own calculations based on IEA, 2022

Figure 1 illustrates the distribution of projects existent in the database, based on their development stage, indicating that most projects are in a development stage, i.e., 35% are undergoing a feasibility study, 23% are in a conceptual stage, with 15% being operational. The remaining 13% are in a demonstration phase (DEMO), with 8% pending the final investment decision (FID), 5% under construction, and the rest either being decommissioned, or their status is unknown.



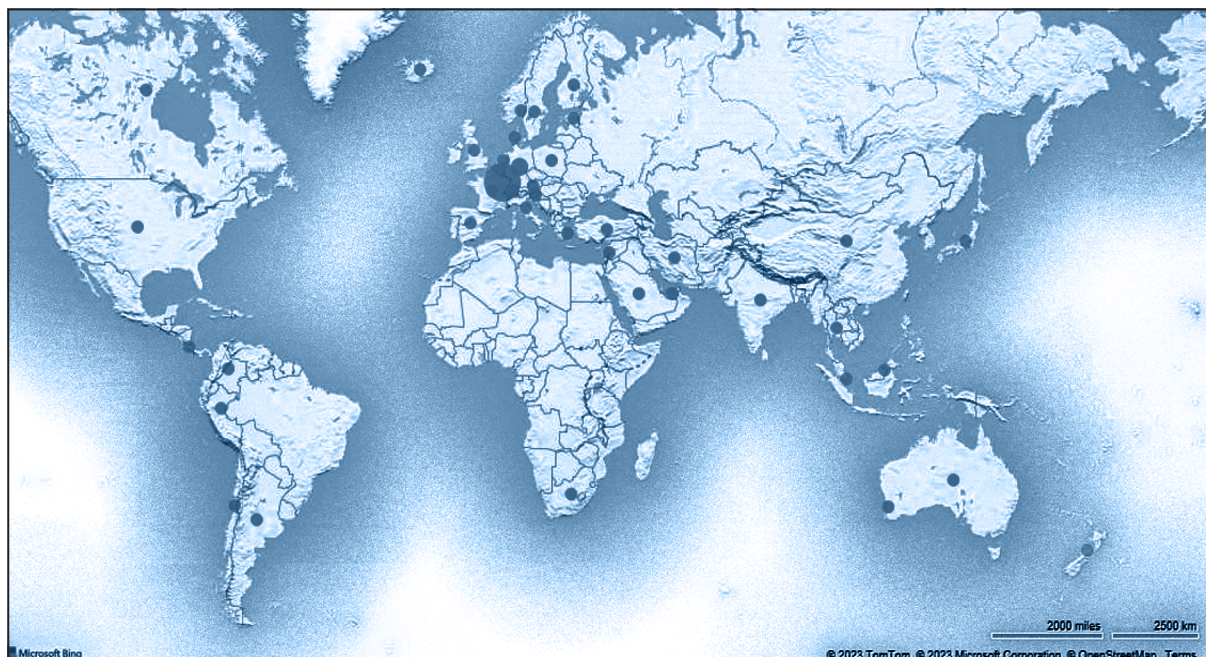
**Figure 1.** The development stage of all projects included in the IEA database

Source: Own calculations based on IEA, 2022

If the geographical distribution is assessed thanks to a global mapping, it is clear from Figure 2 that most projects that are operational and included in this database are located in Europe, with Germany leading the way in terms of the highest number of operational projects included in the database, irrespective of technology or energy source input.

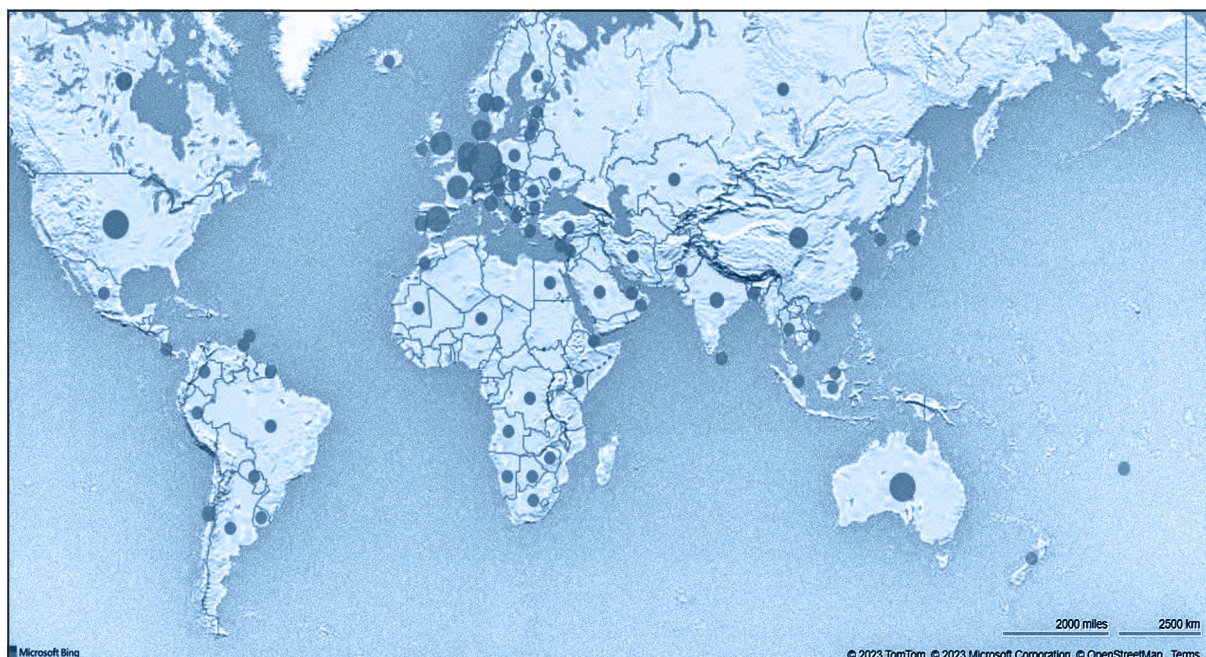
However, the same global mapping looks more diverse if all projects included in the database are considered, since more countries have planned projects, i.e., under various development stages, compared to those that are today already operational. Figure 3 supports visually the findings presented in Table 1.

Diving deeper into the already operational „green” projects, the database contains two types of renewable electricity supply for hydrogen production: a) either dedicated renewable power supply for the hydrogen facility or b) the hydrogen facility is using or plans to use the excess renewable electricity from the grid, in times of renewable energy abundance.



**Figure 2.** Geographical distribution of operational hydrogen projects

Source: Own calculations based on IEA, 2022



**Figure 3.** Geographical distribution of all hydrogen projects (planned/operational)

Source: Own calculations based on IEA, 2022

When it comes to the 227 operational projects included in the IEA database, there are 66 facilities with dedicated renewable electricity supply while 33 are using the electricity from the grid in periods of excess renewable electricity production.

Irrespective of the type of „green” hydrogen facility analyzed, Germany is leading with the highest number of projects, as shown in Table 2 and Table 3. However, which type of energy supply other countries are providing to the existing hydrogen production facilities seems to be different. As such, Germany has 19 operational hydrogen facilities with dedicated renewable power supply, followed by China with 8, and Spain and Great Britain with 4 each, respectively (Table 2). At the same time, Germany has 16 operational hydrogen facilities using the excess renewable electricity from the grid, followed by Denmark with 6 facilities, and Austria and Australia with 2 each, respectively (Table 3).

**Table 2.** Countries with the highest number of operational projects using renewable electricity supply

Country	Number of projects
Germany	19
China	8
Spain	4
Great Britain	4

Source: Own calculations based on IEA, 2022

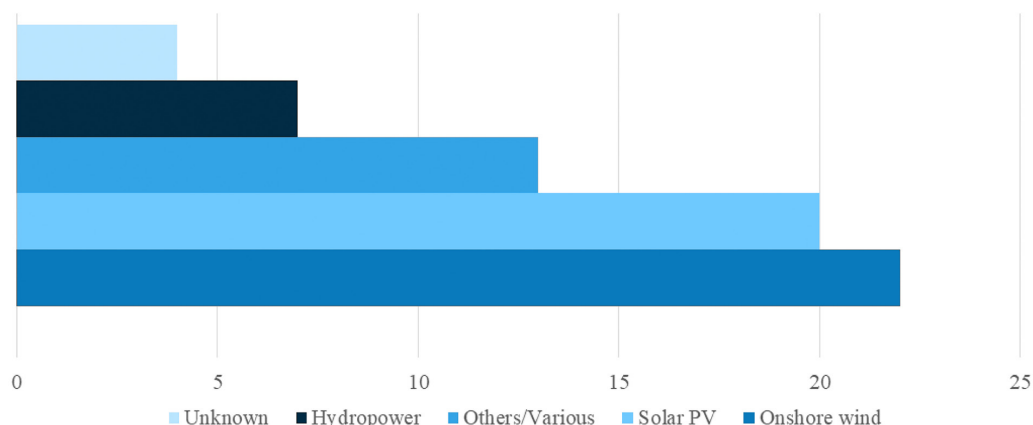
**Table 3.** Countries with the highest number of operational projects using excess renewable electricity from the grid

Country	Number of projects
Germany	16
Denmark	6
Australia	2
Austria	2

Source: Own calculations based on IEA, 2022

Analyzing the renewable energy source is not possible for those projects that are relying on the grid for the available excess renewable energy, since the data is not available in the database, and the energy source may change rapidly depending on the power system analyzed.

However, the projects that have a dedicated renewable energy facility for hydrogen production may provide some insights into the status quo. As such, Figure 4 shows that onshore wind leads the way with 22 operational hydrogen facilities using this renewable energy source around the globe today, followed by solar photovoltaic (PV) power plants with 20 dedicated plants. Further, there are 7 hydrogen projects fuelled by dedicated hydropower projects around the globe with 4 having unknown energy sources, while the remaining 13 projects are labeled as having „other” or „various” energy sources.



**Figure 4.** Dedicated renewable energy sources for operational hydrogen projects (number of projects)

Source: Own calculations based on IEA, 2022

## 5. FUTURE RESEARCH DIRECTIONS

One of the future research directions refers to the size of the hydrogen projects, both operational and planned, expressed in megawatt hours, to understand whether the leading countries in terms of number of projects are also the ones with the most ambition in terms of industrial development of the hydrogen production technologies.

Another direction would be to look into the differences in the hydrogen technologies themselves. For example, it would be insightful to understand whether there is any technological shift between the currently operational hydrogen facilities and the planned facilities: are there newer, more efficient technologies being pursued, and do all countries follow the same technological path?

## 6. CONCLUSION

In conclusion, the findings presented in this paper highlight that hydrogen production has a global character, with a far-reaching and widespread geographical distribution especially when it comes to the planned projects. The data presented emphasizes the significance of renewable electricity as an energy source for hydrogen production facilities in the future, but there are some leading countries today that set themselves apart, among which Germany is noteworthy regardless of the indicator assessed (planned/operational projects, with/without dedicated renewable electricity).

## References

- Cuomo, M. T., Tortora, D., Colosimo, I., Ricciardi Celsi, L., Genovino, C., Festa, G., & La Rocca, M. (2023). Segmenting with big data analytics and Python: A quantitative exploratory analysis of household savings. *Technological Forecasting and Social Change*, 191, 122431. <https://doi.org/10.1016/j.techfore.2023.122431>
- Grech, V. (2018). WASP (Write a Scientific Paper) using Excel – 7: The t-distribution. *Early Human Development*, 118, 64–66. <https://doi.org/10.1016/j.earlhumdev.2018.02.015>
- IEA. (2022). *Hydrogen Projects Database—Data product*. IEA. <https://www.iea.org/data-and-statistics/data-product/hydrogen-projects-database>
- IRENA. (2020, September 21). *Reaching Zero with Renewables*. <https://www.irena.org/publications/2020/Sep/Reaching-Zero-with-Renewables>
- James, N., & Menzies, M. (2022). Spatio-temporal trends in the propagation and capacity of low-carbon hydrogen projects. *International Journal of Hydrogen Energy*, 47(38), 16775–16784. <https://doi.org/10.1016/j.ijhydene.2022.03.198>
- Mathur, S., Ninan, J., Vuorinen, L., Ke, Y., & Sankaran, S. (2021). An exploratory study of the use of social media to assess benefits realization in transport infrastructure projects. *Project Leadership and Society*, 2, 100010. <https://doi.org/10.1016/j.plas.2021.100010>
- Ocenic, E., & Tantau, A. (2023). Redefining the Hydrogen “Colours” based on Carbon Dioxide Emissions: A New Evidence-Based Colour Code. *Proceedings of the International Conference on Business Excellence*, 17, 111–121. <https://doi.org/10.2478/picbe-2023-0013>
- Palocsay, S. W., Markham, I. S., & Markham, S. E. (2010). Utilizing and teaching data tools in Excel for exploratory analysis. *Journal of Business Research*, 63(2), 191–206. <https://doi.org/10.1016/j.jbusres.2009.03.008>
- Pleshivtseva, Y., Derevyanov, M., Pimenov, A., & Rapoport, A. (2023). Comparative analysis of global trends in low carbon hydrogen production towards the decarbonization pathway. *International Journal of Hydrogen Energy*. <https://doi.org/10.1016/j.ijhydene.2023.04.264>
- United Nations. (2015). *The Paris Agreement*. <https://unfccc.int/process-and-meetings/the-paris-agreement>





# Tourism Impacts on the Air, Light and Noise Pollution

Lejla Žunić<sup>1</sup> 

Received: June 22, 2023

Revised: January 12, 2024

Accepted: January 15, 2024

Published: March 16, 2024

## Keywords:

Tourism;  
Impacts;  
Air-light-noise pollution;  
Living world



Creative Commons Non Commercial CC BY-NC: This article is distributed under the terms of the Creative Commons Attribution-Non-Commercial 4.0 License (<https://creativecommons.org/licenses/by-nc/4.0/>) which permits non-commercial use, reproduction and distribution of the work without further permission.

**Abstract:** Various activities in the tourism sector, especially transportation, have a negative impact on the atmospheric complex. The paper aims to research tourism's impact on global carbon dioxide emissions, the generation of photochemical smog, and noise and light pollution. Various tourism industry activities have been identified, as well as tourist transport factors on which the intensity of air pollution depends. To demonstrate the harmful effects, statistical indicators and other results of modern scientific research were used, including the consequences of pollution on the living world. The paper provides current knowledge in the field, highlighting the risks of mass tourism, and the global need for more rational planning of sustainable tourism development.

## 1. INTRODUCTION

According to IUCN (2015), various tourist activities affect air quality: transport; construction and facility power; sound (noise); and lighting. Examples of potential consequences, through the studied literature, include air and noise pollution from vehicles; increased carbon dioxide emissions from fossil fuel combustion, which contributes to global climate change; light pollution can distract reproduction and cause growth crisis (e.g. birds or turtles); noise pollution from vehicular traffic can affect behavior (e.g. bears) and breeding success of nesting birds. „One of the most negative impacts of tourism is on climate through Greenhouse gas emissions, in particular CO<sub>2</sub>. In the tourism sector, energy consumption at destinations and the related GHG emissions strongly depends, e.g., on the infrastructure of the accommodation, particularly installations for heating, cooling and hot water“ (Serrano-Bernardo et al., 2012). Müller (2004) used Switzerland as an example, where hotel accommodation and tourist transportation contribute to air pollution, with tourism accounting for 0.7% of SO<sub>2</sub> emissions, 3.2% of NO<sub>x</sub> emissions, and roughly 28% of CO<sub>x</sub> emissions. „Almost 70% of the carbon emissions generated by the tourism industry originates from the combustion of fuels used for accommodation, transportation, and land use“ (Zhang & Lu, 2022). “The analysis of the carbon footprint of tourism worldwide shows that the greenhouse emissions are due to: transport (particularly air and motor vehicle) 82%, accommodation 4.5%, retail 3.4%, and other activities 8.6%. The transportation of visitors to the destination plays an important role in contributing to the carbon footprint” (Serrano-Bernardo et al., 2012).

According to Table 1, tourism accounts for 5% of all worldwide energy-related CO<sub>2</sub> emissions, with transportation accounting for three-quarters of all GHG emissions. “Transport to and on destinations represents a high percentage of energy consumption (currently about 30%), and a large fraction of it is represented by travels for tourism. If we consider that almost all transport vehicles are fuelled by liquid fuels, travel is certainly responsible for large quantities of GHG emitted into the atmosphere” (Serrano-Bernardo et al., 2012).

<sup>1</sup> University of Sarajevo - Faculty of Science, Zmaja od Bosne 35, 71000 Sarajevo, Bosnia and Herzegovina

**Table 1.** Global CO<sub>2</sub> emissions and tourism contributions from various sectors

	Millions of tones	Share of tourism (%)
Air transport	515	40
Car transport	420	32
Other modus of transport	45	3
Accommodation	274	21
Other activities	48	4
Total tourism	1302	100
World	26400	/
Share of tourism in global CO <sub>2</sub> emissions		<b>4,9</b>

Source: Author adapted according to the WTO data at [Serrano-Bernardo et al., 2012](#)

## 2. METHODOLOGY

The aim of the paper is to identify tourism impacts on air, light, and noise pollution and their potential negative effects on humans and wildlife. The paper's objectives are: a) to analyze tourism transportation's impact on CO<sub>2</sub> emissions and effects on human health; b) to analyze tourism activities' impact on noise pollution and identify its negative consequences on wildlife; and c) to analyze the role of tourist destinations' lights in forming light pollution and its impact on living creatures (birds). Primary and secondary sources were used (relevant literature, official data from corresponding organizations, terrain data, and maps). Identification, analysis, and terrain observations are the main methods in this paper.

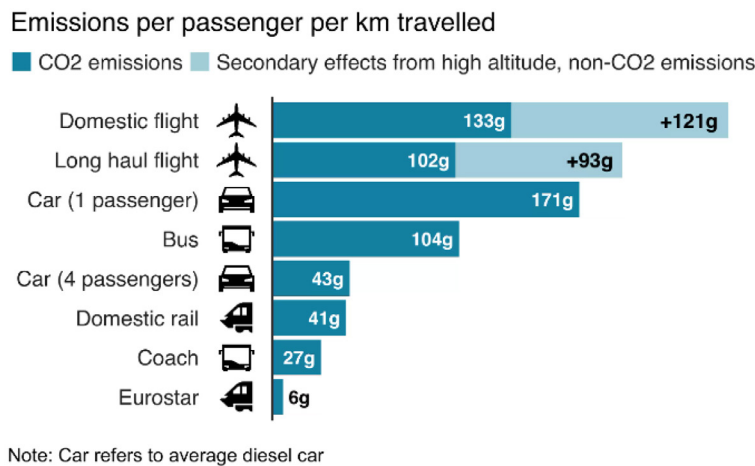
## 3. THE IMPACT OF TOURIST TRANSPORT ON CO<sub>2</sub> EMISSIONS AND AQI

Emissions of CO<sub>2</sub> and other GHG in the tourism transport sector depend on several factors: mode of transport; efficiency of transport means; the size and the state of the transportation network; number of passengers; number of trips; distance traveled; idling (if longer than 10 seconds, it consumes more fuel and emits more CO<sub>2</sub> than restarting the engine); tourist seasonality.

“Air travel accounts for 76% of overall traffic worldwide during the summer vacation season” ([IATA, 2020](#)). “Air travel is the most prevalent in global tourism in 2019 (59%), while, for example, in Bosnia and Herzegovina road transport is more prominent than air transport. The aviation industry accounts for around 8% of global final oil consumption, while road transport (passenger and freight vehicles) accounts for the majority of global final fuel consumption (49.3%)” ([Žunić, 2023](#)). [Serrano-Bernardo et al. \(2012\)](#) stated that the entire contribution of emissions from airplanes to total anthropogenic CO<sub>2</sub> emissions is rather small- around 2%. However, airplanes use 10-30% kerosene, which is as hazardous as diesel and has a severe impact on the air and the health of living creatures. „The comparison showed that at very high contamination levels (10 and 15%) kerosene was 1.3-1.6 times more phytotoxic than diesel fuel and 1.3-1.4 times more toxic than crude oil, and at low (1 and 2%) and medium (3 and 5%) levels the toxicity of these contaminants was close differing by a factor of 1.1-1.2“ ([Sharonova & Breus, 2012](#)). „ An aircraft can produce up to 4% of the global CO<sub>2</sub> emissions each year. Burning kerosene produces pollutants like carbon dioxide, nitric and nitrogen oxide, sulfur oxides, and soot. The hotter the inside temperature of the engine, the more efficiently fuel is burned. These higher temperatures increase the NO<sub>x</sub> emissions that harm the ozone. This results in additional emissions that contribute to air pollution and the warming of our climate“ ([NASA, 2007](#)). “However, airplanes transport a substantially greater number of passengers. The energy intensity of automobile transportation is 57% higher than that of air transportation; a car emits more CO<sub>2</sub> than an average airplane because it requires more energy to transport

the same number of passengers. As a result, air travel is more environmentally sustainable than car travel. On the other hand, UNEP advocates for reducing flights and promoting domestic tourism” (Žunić, 2023). “According to EPA, a typical passenger vehicle emits about 4.6 metric tons of carbon dioxide per year. One long flight releases the equivalent of nearly 14% of the annual emissions from a car. When comparing the number of emissions per person, flying is better than driving” (Sunkara, 2022). „In short travels, the contribution of LTO to fuel consumption and CO<sub>2</sub> emissions is very high. This is the reason why flights covering long distances become more convenient in terms of the amount of CO<sub>2</sub> emitted per km” (Serrano-Bernardo et al., 2012).

The summer tourist season is the most pronounced on a global level due to the use of annual vacations in that period of the year, which significantly contributes to traffic congestion and air pollution. “Only two summer months (June and July) account for 44% of all foreign arrivals” (UNWTO, 2022). In Sarajevo, for example, traffic congestion is increased during the peak tourist season (summer), due to both the influx of tourists and enhanced seasonal transport on roads and rails, primarily towards the Adriatic (in the southern route through the Neretva valley); there are also a greater number of flights (charter, etc.).



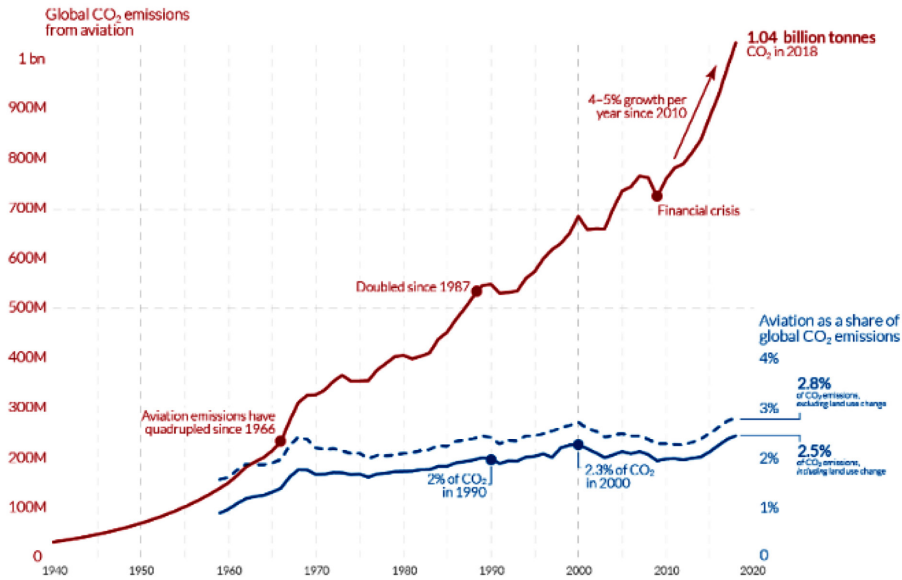
**Figure 1.** Emissions of CO<sub>2</sub> by different modes of transport - economic class

Source: BBC, 2019

According to Ritchie (2020b), driving a small Mini car emits 111 g CO<sub>2</sub>eq per km, while a large 4×4 car emits ~200 gCO<sub>2</sub>eq per km. Adding one additional passenger traveling to the same location would halve emissions per passenger-kilometer. A car would produce over 100 kilograms of CO<sub>2</sub>eq on the 500-kilometer journey, while flying would raise emissions by nearly one-third (128 kg CO<sub>2</sub>eq); taking the train would be 80% lower (21 kg CO<sub>2</sub>eq). At moderate distances (1000 kilometers), flying has a higher carbon footprint than a medium-sized car. If the distance is longer (>1000 kilometers or an international flight), then flying would actually have a slightly lower carbon footprint per kilometer than driving alone over the same distance. Sunlu (2003) stated that one transatlantic flight releases about half of the CO emissions produced by all other sources (lighting, heating, car use, etc.) that the average individual consumes annually.

From the Figure 2, there is a positive growth in CO<sub>2</sub> emissions from aviation (passenger air travel, freight, and military operations) with an annual rate of 4–5% since 2010. Global aviation emitted 1.04 billion metric tons of CO<sub>2</sub> in 2018. Ritchie (2020a) stated the increased CO<sub>2</sub> emissions from air travel have been accelerated by the swift development of air traffic and global tourism. Global aviation (domestic and international; passenger and freight) accounts for: 1.9%

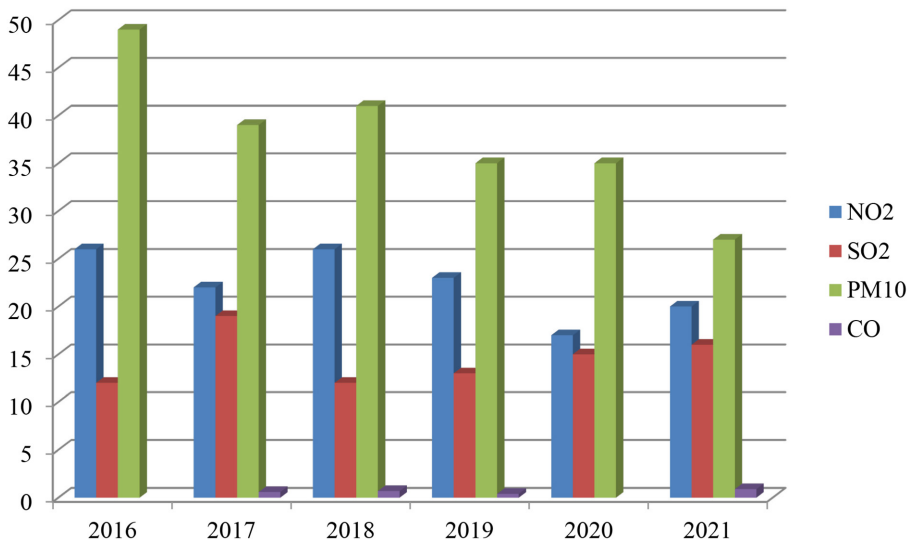
of GHG emissions (which includes all GHG, not only CO<sub>2</sub>); 2.5% of CO<sub>2</sub> emissions, 3.5% of ‘effective radiative forcing’- its impact on warming (CO<sub>2</sub> accounts for less than half of this warming, while contrails from aircraft exhausts account for the largest share).



**Figure 2.** Global CO<sub>2</sub> emissions from aviation 1940-2020.

Source: Ritchie, 2020a

Tourist transportation and certain tourist activities contribute to global and local air pollution. Tourist buses, for example, leave their engines running for hours while tourists go on adventures and want to return to a comfortable air-conditioned bus; traffic congestion during the tourist seasons also contributes to this. “Fuel use and CO<sub>2</sub> emissions are always greater for idling over 10 seconds. If each car idles for just 6 minutes per day, about 3 billion gallons of fuel are wasted annually, costing drivers \$10 billion or more” (Gaines et al., 2012).

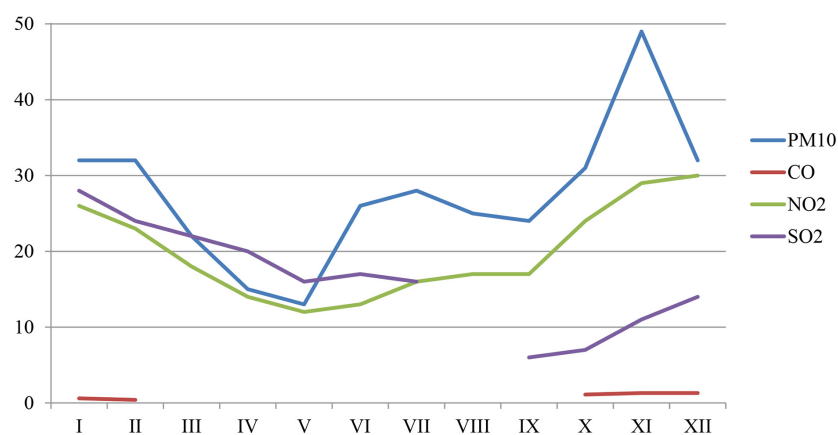


**Figure 3.** Growth of the Sarajevo air pollutants (average annual concentrations in mg/m<sup>3</sup>) (monitoring Vijećnica) for the period 2016-2021.

Source: Author (adapted according to the reports from the Federal Hydrometeorological Institute (2022) and Institute for Public Health of Canton Sarajevo, 2022))

An example of Sarajevo AQI related to tourism impacts, according to the average annual concentrations for the period 2016–2021 (figure 3), demonstrates a positive growth for four air pollutants (excl. 2019–2020 bcs. of COVID movement restrictions), in particular NO<sub>2</sub> and PM<sub>10</sub>, which come mostly from tourist vehicles and traffic congestion, including increased idling on the city's narrow roads during the peak tourist season.

Sarajevo's air pollution is growing along with the country's tourism blooming, posing new hazards to human and wildlife health. There's a popularly known "*Syndrom of Sarajevo Lungs*" as the lower AQI negatively affects human health; e.g., respiratory diseases are among the five main causes of population death in 2020. "WHO estimates that Bosnia and Herzegovina's air is the most polluted among European countries" (Sivac, 2022), which can be easily attributed to expanding tourism.



Note: the broken line - "no available data for the year" (N/A)

**Figure 4.** Average monthly values (mg/m<sup>3</sup>) of monitored parameters during 2021.

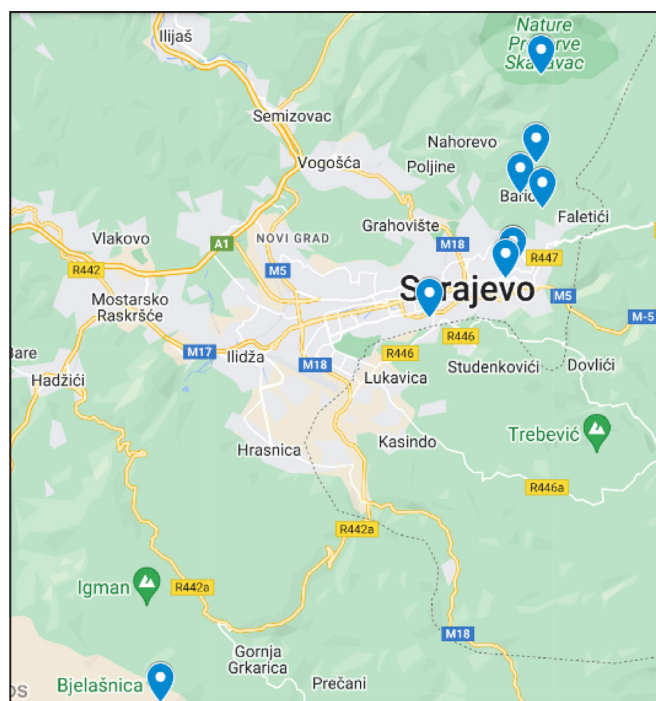
**Source:** Author (adapted according to the [Institute for Public Health of Canton Sarajevo, 2022](#))

The values of air pollutants (Fig.4) are demonstrably higher during the summer and winter seasons. Apart from the physical-geographical factors that contribute to this, especially in the cold months (basin location and temp. inversions), tourism is a significant source of increased air pollution during the winter and summer seasons; mountains near Sarajevo are crowded in the winter with both domestic and foreign tourists, as well as diaspora visitors, while the city (as well as the country) is generally mostly visited during the summer.

#### 4. TOURISM IMPACT ON NOISE POLLUTION AND WILDLIFE DISTURBANCE

"Noise pollution from airplanes, cars, and buses, as well as recreational vehicles such as snowmobiles and jet skis, causes disturbance, stress, hearing loss, and disturbance of wildlife, especially in sensitive areas" (Sunlu, 2003). Arbor (2020) stated the effects of noise pollution on the reproductive success of 58,506 nests from 142 species across North America include delayed nesting, no reproduction, and no mating and breeding due to the non-transmission of the "seduction" song. According to Thomas (2018), noise pollution delays nesting for birds whose songs are at a lower frequency and thus more difficult to hear through low-frequency, human-caused noise. Mating decisions are made based on the male's song, and in some cases, females need to hear the male's song to become physically ready to breed. According to Halfwerk et al. (2011), many species rely to some extent on auditory contact for reproductive success. Anthropogenic noise has a detrimental impact on bird breeding density and reproductive output, with particularly negative effects for species vocalizing at low frequencies (e.g., pigeons and cuckoos).

“Main effects of coexistence with humans for bears are increased disturbance, human-bear conflicts and human-caused mortality; behavioral alterations; reduced fitness and genetic diversity; and physiological alterations” (Morales-Gonzalez et al., 2020). In the example of Sarajevo, there has been spotted a rare phenomenon - annoyed bears in the suburban zone, who escaped from quad noise presented in the mountain surroundings (*Vratnik/ Old town of the city*). The bear was seen by locals and rangers, who observed that he was frightened by the sound of the jeeps driving near their forest habitat.



**Figure 5.** Sarajevo’s picnic and quad spots  
**Source:** Author (based on [Google My Maps, 2023](#))



**Figure 6.** Annoyed bear in the suburban area of Sarajevo  
**Source:** [Informative portal Klix, 2023](#)

The map shows quad spots near Sarajevo (Bukovik, Čavljak, Barice, D. Biosko, Vraca, and Bjelašnica), in which anthropogenic activity rises, the building of roads and recreational sites

(e.g. quad tourism); bears, disturbed by the noise of motor vehicles, descend from the surrounding forests to the suburban village of Vratnik, which is only a 5-minute drive from the most visited tourist site of Bašćaršija in the old town.

## 5. TOURISM IMPACT ON LIGHT POLLUTION AND MIGRATING BIRDS

Photochemical smog and light pollution have negative effects on the life, migrations, feeding, breeding and reproduction of living organisms (e.g. birds). “Photochemical smog is a mixture of pollutants that are formed when nitrogen oxides and volatile organic compounds react to sunlight, creating a brown haze above cities; it tends to occur more often in summer” (EPA, 2004), while “light pollution is brightening of the night sky caused by street lights and other man-made sources, which has a disruptive effect on natural cycles and inhibits the observation of stars and planets” (Oxford Dictionary). City lights have a confusing effect on the birds' migrations, resulting in potential wandering, colonization near cities, and other negative outcomes (fatigue, disease, injury, and death). UD study of North American birds (Thomas, 2018) revealed problems with south migration and increased bird density near metropolitan areas due to the city lights. City lights mislead migrating birds on their way to their final destination. Arbor (2020) stated that the effects of light pollution on the reproductive success of 58,506 nests from 142 species across North America include premature nesting and unavailability of food. City lights attract migrating birds (geese, cerulean warblers, etc.), throwing them off course. “Autumnal migrant stopover density increased at regional scales with proximity to the brightest areas but decreased within a few kilometers of brightly-lit sources. This finding implies broad-scale attraction to artificial light while airborne, impeding selection for extensive forest habitat” (McLaren et al., 2018). “Most birds migrate at night through increasingly light-polluted skies. Bright light sources can attract airborne migrants and lead to collisions with structures, but might also influence the selection of migratory stopover habitat and thereby acquisition of food resources” (McLaren et al., 2018). They are also more likely to perish or be wounded when they come into contact with urban hazards such as highways and buildings. “Migratory animals have an impact on ecosystems throughout their entire range, which for some birds can extend over 10,000 kilometers” (Thomas, 2018). “Given that high-quality stopover habitat is critical to successful migration, and hindrances during migration can decrease fitness, artificial lights present a potentially heightened conservation concern for migratory bird populations” (McLaren et al., 2018). There’s an example of Sarajevo’s seagulls in the urban center with a pre-mountain climate, potentially affected by illumination in the tourist-crowded coastal Adriatic area, but also because of the active airspace noised by numerous tourist flights during extended tourist summer-fall season.

Although the majority of seagulls are migratory birds to warmer climates (*European gulls migrate to Africa or South and Southeast Asia*), they settled down in Sarajevo during the last decade (Birdfact, 2022). Despite some sources claiming their presence here has resulted in food supplies from wild dumps, climate change and light pollution shouldn’t be neglected as potential causes of their lost navigation. Settlement in the urban continental environment with insufficient supplies of food is an intriguing phenomenon to investigate; seagulls prefer to fish in open seas rather than in polluted city rivers (e.g. Željeznica). Bosnia and Herzegovina is situated on the migratory route of seagulls, with congested Mediterranean destinations (e.g., Neum, Adriatic Sea), followed by the overall tourist expansion of the country; “BiH had the third highest tourism growth rate in the World in 2019” (USAID, 2020). The light and noise pollution from tourism traffic and lights could be a reasonable explanation for seagulls' stopover in Sarajevo.



**Figure 7.** Seagulls on the city river Željeznica, Sarajevo, BiH

Source: Author

## 6. FUTURE RESEARCH DIRECTIONS

As tourism's impact on air, light, and noise pollution with negative consequences for humans and wildlife presents an associated occurrence in growing destinations, tourism-focused places will need to tighten their tourism and environmental policies. The primary task of mitigating the detrimental impacts of tourism is to monitor changes in nature and behaviors. Radar tracks and other advanced methods should be implemented to expand knowledge regarding the impacts of tourism on the environment. This study clarifies the environmental risks of tourism expansion in the case of Sarajevo, and other relevant world examples, while also encouraging more sustainable tourist activities beneficial to humans and other living creatures; some are discussed in the paper's conclusion.

## 7. CONCLUSION

The tourism industry contributes to air, noise and light pollution, producing a variety of crises for humans and wildlife, including health, reproduction, and breeding issues. Animals' unpredictable behavior can be triggered by different threats, e.g., Sarajevo' annoyed bears leaving their mountain habitat and descending into the calmer suburban areas due to the noisy adventure tourist activities (e.g. quad tours), or the lost seagulls due to the tourist Mediterranean lights and illuminated noisy sky by increased air traffic. Tourism seasons (winter and summer) are followed by decreased AQI (e.g., Sarajevo, Bosnia's most visited destination). Environmental monitoring should be established in expanding tourism destinations, with a focus on lowering GHG emissions while simultaneously preventing additional threats. Accounting for the fact that long flights have a higher impact on air pollution, encouraging domestic tourism could be a reasonable solution, as well as practicing more environmental activities through other sustainable forms of tourism (nature and eco-tourism). Alternative modes of access to popular tourist attractions: walking, carriage transport, or bike routes, should be preferred over traffic roadways.



For instance, Amsterdam is „the bicycle capital of the world“, because „the city is equipped with an elaborate network of cycle-paths and lanes as the easiest mode of transport“ (Van der Zee, 2015), while famous Bosnian eco-tourist site (e.g., protected area of “Springs of Bosnia” near Sarajevo), is accessed by horse-drawn carriage. Group-organized tours are more sustainable than individual trips. “Most of the emissions from the transport sector are produced by private cars; many cities have successfully managed to reduce CO<sub>2</sub> emissions by as much as 50% by reducing or limiting the flow of private cars” (RIDANGO, 2022). “By eliminating one car and taking public transportation instead of driving, a saving of 30% of carbon dioxide emissions can be realized” (KCATA, 2023). Ecological hotels can contribute with their saving concepts: e.g., LED lights reduce carbon emissions by 6 tons per year; green roofs reduce urban heat; resort gardens create natural shading; “net cooling effect of a young healthy tree is equivalent to ten room-size air conditioners operating 20 hours a day” (USDA, 2021).

## References

- Arbor, A. (2020). Large-scale nest study shows that noise and light pollution alter bird reproduction. *School for Environment and Sustainability (SEAS)*, University of Michigan. <https://seas.umich.edu/news/large-scale-nest-study-shows-noise-and-light-pollution-alter-bird-reproduction>
- BBC. (2019). *Climate change: Should you fly, drive, or take the train?* <https://www.bbc.com/news/science-environment-49349566>
- Birdfact. (2022). *Do Seagulls Migrate? (All You Need To Know)* <https://birdfact.com/articles/do-seagulls-migrate#:~:text=Seagulls%20migrate%20through%20much%20of,Africa%20or%20the%20Middle%20East>
- EPA. (2004). *Photochemical smog- what it mean for us?* EPA South Australia. [https://www.epa.sa.gov.au/files/8238\\_info\\_photosmog.pdf](https://www.epa.sa.gov.au/files/8238_info_photosmog.pdf)
- Federal Hydrometeorological Institute. (2022). *Annual Report on Air Quality in the Federation of Bosnia and Herzegovina for the year 2021*. FHMZ, Sarajevo. <https://www.fhmzbih.gov.ba/PUBLIKACIJE/zrak/izvjestaj-2021.pdf>
- Gaines, L., Rask, E., & Keller, G. (2012). Which Is Greener: Idle, or Stop and Restart? Comparing Fuel Use and Emissions for Short Passenger-Car Stops. *Alternative Fuels Data Centre*, Argonne National Laboratory, U.S. Department of Energy. [https://afdc.energy.gov/files/u/publication/which\\_is\\_greener.pdf](https://afdc.energy.gov/files/u/publication/which_is_greener.pdf)
- Google My Maps. (2023). Create My Map. <https://www.google.com/maps/d/edit?hl=en&mid=1636AQuvFQhHwim6iVqJgJqNC8t0CXx8&ll=43.83806767621165%2C18.143355319515404&z=11>
- Halfwerk, W., Bot, S., Buikx, J., Van der Velde, M., Komdeur, J., Ten Cate, C., & Slabbekoorn, H. (2011). Low-frequency songs lose their potency in noisy urban conditions. *Proceeding of the National Academy of Sciences of the United States of America (PNAS)*, vol. 108 (35). <https://doi.org/10.1073/pnas.1109091108>
- IATA. (2020). *Air Connectivity - Measuring the connections that drive economic growth*. <https://www.iata.org/en/iata-repository/publications/economic-reports/air-connectivity-measuring-the-connections-that-drive-economic-growth/>
- Informative Portal Klix. (2023). *A bear on Vratnik, the intervention team of the hunting association was dispatched to the field*. <https://www.klix.ba/vijesti/bih/medvjed-na-vratniku-interventni-tim-lovackog-drustva-upucen-na-teren/230518018>
- Institute for Public Health of Canton Sarajevo. (2022). *Report on Air Quality Monitoring in the Canton of Sarajevo for the year 2021*. [https://www.zzjzbih.ba/wp-content/uploads/2022/05/bosanski-ZZJZ\\_web.pdf](https://www.zzjzbih.ba/wp-content/uploads/2022/05/bosanski-ZZJZ_web.pdf)

- IUCN. (2015). *Tourism and Visitor Management in Protected Areas - Guidelines for sustainability*. Edited by Leung, Y.-F., Spenceley, A., Hvenegaard, G. & Buckley, R. IUCN WCPA's Best Practice Protected Area Guidelines Series No. XX. [https://iucn2.cnr.ncsu.edu/images/6/69/Sustainable\\_Tourism\\_BPG\\_Condensed\\_IUCN\\_Committee\\_9SEP2015CRG10-4-15\\_YFL10-8-15\\_CLEANED.pdf](https://iucn2.cnr.ncsu.edu/images/6/69/Sustainable_Tourism_BPG_Condensed_IUCN_Committee_9SEP2015CRG10-4-15_YFL10-8-15_CLEANED.pdf)
- KCATA. (2023). *Environmental Benefits of Public Transit - Go Green with RideKC- Reducing greenhouse gas emissions and CO2 with public transit*, Kansas City Area Transportation Authority. [https://www.kcata.org/about\\_kcata/entries/environmental\\_benefits\\_of\\_public\\_transit#:~:text=That%20is%20equal%20to%2010,dioxide%20emissions%20can%20be%20realized](https://www.kcata.org/about_kcata/entries/environmental_benefits_of_public_transit#:~:text=That%20is%20equal%20to%2010,dioxide%20emissions%20can%20be%20realized)
- McLaren, J. D., Buler, J. J., Schreckengost, T., Smolinsky, J. A., Boone, M., Loon, E. E., Dawson, D. K., & Walters, E. L. (2018). Artificial light at night confounds broad-scale habitat use by migrating birds. *Ecology Letters* 21(3), Wiley. <https://doi.org/10.1111/ele.12902>
- Morales-Gonzalez, A., Ruiz-Villar, H., Ordiz, A., & Penteriani, V. (2020). Large carnivores living alongside humans: Brown bears in human-modified landscapes. *Global Ecology and Conservation*, Vol. 22, e00937. <https://doi.org/10.1016/j.gecco.2020.e00937>
- Müller, H. (2004). *Tourism and Ecology*. Zagreb: Masmedia.
- NASA. (2007). Cleaner Skies. Edited by E. M. Marconi. *NASA's John F. Kennedy Space Center and Glenn Research Center*.
- RIDANGO. (2022). *Five reasons why using public transport is better for the environment*. <https://ridango.com/five-reasons-why-using-public-transport-is-better-for-the-environment/>
- Ritchie, H. (2020a). Climate change and flying: what share of global CO2 emissions come from aviation? "Our World in Data". <https://ourworldindata.org/co2-emissions-from-aviation>
- Ritchie, H. (2020b). Which form of transport has the smallest carbon footprint? *Organisation "Our World in Data"*. <https://ourworldindata.org/travel-carbon-footprint>
- Serrano-Bernardo, F. A., Bruzzi, L., Toscano, E. H., & Rosúa-Campos, J. L. (2012). Pollutants and Greenhouse Gases Emissions Produced by Tourism Life Cycle: Possible Solutions to Reduce Emissions and to Introduce Adaptation Measures. Chapters, in: Budi Haryanto (ed.), *Air Pollution- A Comprehensive Perspective*. IntechOpen, DOI: 10.5772/50418. <https://www.intechopen.com/chapters/38346>
- Sharonova, N., & Breus, I. (2012). Tolerance of cultivated and wild plants of different taxonomy to soil contamination by kerosene. *Science of The Total Environment*, 424, 121-129. <https://doi.org/10.1016/j.scitotenv.2012.02.009>
- Sivac, A. (2022). *Basic geoinformation model of the spatial distribution of air pollutants in the air of the Sarajevo Basin in the context of urban and spatial planning*. [Dissertation, Faculty of Science, University of Sarajevo].
- Sunkara, L. (2022). Which Is Worse for the Environment: Driving or Flying? *Reader's Digest*, Truusted Media Brands, Inc. <https://www.rd.com/article/which-is-worse-for-the-environment-driving-or-flying/>
- Sunlu, U. (2003). Environmental impacts of tourism. In: *Camarda D. (ed.), Grassini L. (ed.). Local resources and global trades: Environments and agriculture in the Mediterranean region*. Bari: CIHEAM, 2003. p. 263-270 (Options Méditerranéennes: Série A. Séminaires Méditerranéens; n. 57). <https://om.ciheam.org/om/pdf/a57/04001977.pdf>
- Thomas, A. (2018). City Lights are an Attraction for Migrating Birds. UD Study. *University of Delaware*. <https://www.udel.edu/udaily/2018/january/light-pollution-migrating-birds-urban-areas/>
- UNWTO. (2022). *International Tourism Back to 60% of Pre-pandemic Levels in January-July of 2022*. <https://www.unwto.org/news/international-tourism-back-to-60-of-pre-pandemic-levels-in-january-july-2022>

- USAID. (2020). *FACT SHEET: Developing Sustainable Tourism (Turizam) in Bosnia and Herzegovina*. <https://www.usaid.gov/bosnia-and-herzegovina/fact-sheets/fact-sheet-developing-sustainable-tourism-turizam-bosnia-and-herzegovina#:~:text=In%202019%2C%20the%20country%20had,and%20hampered%20the%20sector's%20development>
- USDA. (2021). *Forest Service- Caring For the Land and Serving People*. U.S. Department of Agriculture. <https://www.fs.usda.gov/detail/r9/home/?cid=STELPRD3832558#:~:text=Did%20you%20know%20the%20net,Forests%20report%20for%20more%20details>
- Van der Zee, R. (2015). How Amsterdam became the bicycle capital of the world. *The Guardian*. <https://www.theguardian.com/cities/2015/may/05/amsterdam-bicycle-capital-world-transport-cycling-kindermoord>
- Zhang, J., & Lu, Y. (2022). Exploring the Effects of Tourism Development on Air Pollution: Evidence from the Panel Smooth Transition Regression Model. *International Journal of Environmental Research and Public Health*, 19(14), 8442. <https://doi.org/10.3390/ijerph19148442>
- Žunić, L. (2023). *Impacts of Tourism*. Sarajevo: Faculty of Science, University of Sarajevo, ISBN 978-9926-453-62-6, COBISS-ID 55357702. [https://pmf.unsa.ba/wp-content/uploads/2023/06/ZunicLejla\\_e-knjiga\\_CIP\\_ISBN\\_za\\_web\\_PMF\\_i\\_NUBBiH.pdf](https://pmf.unsa.ba/wp-content/uploads/2023/06/ZunicLejla_e-knjiga_CIP_ISBN_za_web_PMF_i_NUBBiH.pdf)





# Some Alternative Strategies Applied to Brewery Spent Grains for the Development of Sustainable Recycling Solutions in the Agro-Food Industry

Luljeta Pinguli<sup>1</sup>   
Ilirjan Malollari<sup>2</sup> 

Received: July 31, 2023  
Accepted: November 3, 2023  
Published: March 16, 2024

## Keywords:

Brewer's spent grain (BSG);  
By-products;  
Recovery and recycle;  
Stabilization;  
Pretreatment methods

**Abstract:** *Brewer's spent grain (BSG) is a raw material produced during beer production that has a high potential for sustainable reuse. BSG is considered an important feedstock for producing several products. Brewer's spent grain (BSG) is the main by-product obtained after wort production commonly used as animal feed. Recently research work has focused on application in different areas, because of BSG's low cost, large availability, and valuable chemical composition. Brewer's spent grain forms 85% of the total by-products generated.*

*Of the breweries that produce potential by-products, their recovery is another cost-effective pollution prevention option that can provide a facility with significant economic benefits while simultaneously reducing waste production.*

*BSG water content is around 80 - 85 %. Dry BSG content has around 60-63% hemicellulose, cellulose, and lignin, protein content is around 22-25%, lipids 8-9%, phenolic compounds 1.7-2%, ash 2.5%.*

*In Albania spent grain is used as feed for animals without any other pretreatment. Our experiment is focused on spent grain pretreatment and stabilization techniques to extend BSG's life. BSG pretreatment/stabilization techniques can be employed as a function of their future destination such as energy production, food additives production, using BSG as a substrate for enzyme production, etc. In this paper, we have used three different pretreatment/stabilization procedures. Thin layer drying technique, alginate treatment of BSG, and vacuum filtration of BSG with cold and hot water. For each sample, we have monitored drying kinetics based on the remaining water content and BSG's life.*



Creative Commons Non Commercial CC BY-NC: This article is distributed under the terms of the Creative Commons Attribution-Non-Commercial 4.0 License (<https://creativecommons.org/licenses/by-nc/4.0/>) which permits non-commercial use, reproduction and distribution of the work without further permission.

## 1. INTRODUCTION

Recently, many interesting and advantageous processes for the application of BSG in foods, energy production, chemical, and biotechnological processes have been reported (Arranz et al., 2018). The brewery industry generates enormous amounts of waste, the management of which is economically troublesome. Their accumulation in the environment is an ecological issue as well. The increasing public concerns about environmental pollution have prompted the search for ways to reduce the production of industrial waste. The food industry is trying to find new applications that will change the traditional approach to 'waste' products and make them 'co-products' (Rachwał et al., 2020). With their properties, by-products generated by the brewing industry have the potential to be applied as materials exploited in the food industry, but their use is still quite limited. Modern food science and technology aim to valorize the food industry

<sup>1</sup> University of Tirana, Faculty of Natural Sciences, Department of Industrial Chemistry, Blvd. Zogu I. Tirana, Albania

<sup>2</sup> University of Tirana, Faculty of Natural Sciences, Department of Industrial Chemistry, Blvd. Zogu I. Tirana, Albania

by-products to produce chemicals, raw materials, and other value-added compounds (Rachwał et al., 2020). Although studies focused on the reuse of brewery by-products are being conducted, there are no comprehensive review articles concerning all three types of brewery waste showing its potential to be used in the food industry (Amoriello & Ciccoritti, 2021).

BSG is a raw material of interest for application in different areas, because of its low cost, large availability throughout the year, and valuable chemical composition (Mussatto, 2014).

Brewer's spent grain (BSG) is an insoluble solid residue obtained after wort production and is the most abundant brewing industry byproduct forming 85% of total byproducts generated. BSG for human consumption has gained attention, mainly because of its health-related bioactive components. These bioactive compounds include secondary metabolites, such as alkaloids, antibiotics, plant growth factors, food-grade pigments, and phenolic acids. BSG is considered also a source of phenolic compounds, particularly hydroxycinnamic acids (HCAs), which include ferulic, *p*-coumaric, sinapic, and caffeic acids. BSG is also considered a source of dietary fiber for humans, especially viscous fibers, which aid in increasing cholesterol and fat excretion (Ikram et al., 2017).

Several attempts have been made to utilize BSG in the production of value-added compounds (xylitol, lactic acid), microorganisms' cultivation, or simply as raw material for extraction of compounds such as sugars, proteins, acids and antioxidants BSG can be used as a substrate for enzyme production and could be one of the ways which substantially reduces the enzyme production cost (Mussatto, 2014).

Several methods have been proposed to prolong brewer's spent grain (BSG) storage time because of its high moisture content. Drying has been the most effective method of preserving BSG (Aboltins & Palabinskis, 2015). Drying as a preservation method has the advantage of reducing the product volume and decreasing transport and storage costs. There exist different techniques to decrease moisture content including pressing, rotary-drum drying, freeze-drying, thin layer drying, etc... (Mallen & Najdanovic-Visak, 2018).

The polysaccharide, protein content, and high moisture contents of BSG make it sensitive to microbial growth and degradation. The presence of resident microflora initiates these processes within the shortest time, to utilize it as the sole carbon source. This substrate is suitable to perform solid-state fermentations and submerge fermentations. BSG is a suitable medium for the isolation and maintenance of unknown strains and highly suitable for screening and production of new biologically active substances (Mitri et al., 2022).

To preserve the quality of BSG can be used also chemical preservatives such as lactic, formic, acetic, benzoic acid, and potassium sorbate.

## 2. EXPERIMENT

### 2.1. Expected Achievements and Benefits

We intend to set up a chemical/physical pre-treatment stabilization method to reduce the perishability of BSG. We intend to compare three pretreatment techniques and propose the most suitable technique to reuse BSG in the food/feed industries.

## 2.2. Characterization of Raw and Stabilized Materials

Collection of BSG samples was carried out by “Stefani & Co.”, a brewery situated in Tirana. Solid waste produced by this brewery is summarized in Table 1. Spent grain is the most abundant waste followed by yeast. Spent grain in this brewery goes for animal feeding. Despite this, a pretreatment and stabilization procedure are needed to ensure a safe and long-life product.

In this paper, we have proposed and compared three pre-treatment/stabilization methods. Regarding their final moisture content and BSG’s life, we are going to propose one of the most suitable methods.

Breweries produce potential by-products; their recovery is another cost-effective pollution prevention option that can provide a facility with significant economic benefits while simultaneously reducing waste production. The most important by-products come from brewhouse and fermentation stages.

- **spent grains**, which are used for animal feed.
- **spent hops, hot trub** and other solid proteinaceous materials are combined with spent grains and sold as animal feed.
- **yeast** (which can be collected from fermentation and storage tanks, and the filter line) is sold for animal or human consumption.

**Table 1.** Impact of Different Brewing Stages on Environmental Concerns

STAGE	ENVIRONMENTAL CONCERN
BREWHOUSE	High amounts of discharged organic matter (BSG) High water consumption High energy consumption Caustic and acidic wastes from CIP cleaning
FERMENTATION/STORAGE	High amounts on discharged of organic matter High water consumption High energy consumption Caustic and acidic wastes from CIP cleaning Yeast discharged. Solid waste discharge (trub) CO <sub>2</sub> emission
FILTRATION	High amounts on discharged of organic matter High water consumption High energy consumption Caustic and acidic wastes from CIP cleaning Solid waste discharge (trub)
PACKAGING LINES	High amounts on discharged of organic matter High water consumption High energy consumption Caustic wastes from cleaning Solid wastes handling High noise level
OTHER OPERATIONS	High water consumption High energy consumption Chemical and special waste handling Ammonia Solid wastes handling High noise level

Source: “Stefani & Co” Brewery, Tirana, Albania

**Table 2.** Solid Wastes Generated from “Stefani & Co” Brewery

STAGE	TYPE OF SOLID WASTE	GENERATION AMOUNT
BREWHOUSE	Spent grain (80% moisture) + Trub.	16 kg/hl beer
	Malt Dust	0.12 kg / hl beer
	Trub	0.004 kg / hl beer
FERMENTATION/CONDITIONING	Surplus yeast (90% moisture)	2 kg / hl beer
FILTRATION	Kieselguhr (70% moisture) PVPP (regenerable)	0.4 kg/hl beer
PACKAGING LINES / AUXILIARY MATERIAL	Glass (70 % recyclable)	0,2 kg/hl beer
	Plastic	0,3 kg/hl beer
	Paper	0,11 kg/hl beer
	Cans + Crowns	0,019 kg/hl beer
	Cardboard	0,098 kg/hl beer
	Wood	0,022 kg/hl beer
TOTAL	(kg/hl beer)	19,273

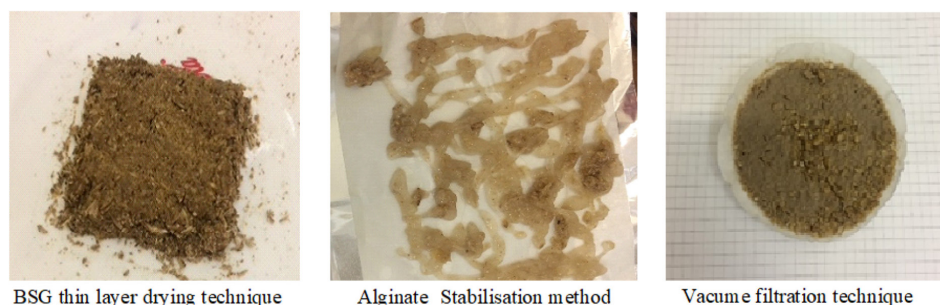
Source: “Stefani & Co” Brewery, Tirana, Albania

### 2.3. Pretreatment/Stabilization Methods

We intend to combine some different processing methods to extend BSG’s life. In this paper, we have used three different pretreatment/stabilization procedures.

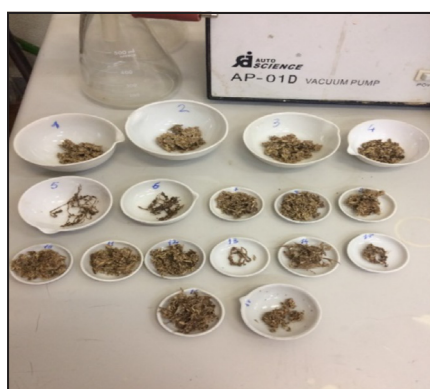
1. Applying pressing technology combined with thin layer drying technique.
2. Alginate treatment of BSG. After this procedure to prolong preservation time we can also use lactic acid treatment (alternative).
3. Vacuum filtration of BSG with cold and hot water.

For each sample, we have monitored drying kinetics based on remaining water content and BSGs.



**Figure 1.** Photo of BSG treated with different stabilization techniques

Source: Chemical Engineering Laboratory, FSHN, Tirana, Albania, 2023



**Figure 2.** Final moisture content measurements (3 g samples) made for each technique applied

Source: Chemical Engineering Laboratory, FSHN, Tirana, Albania, 2023

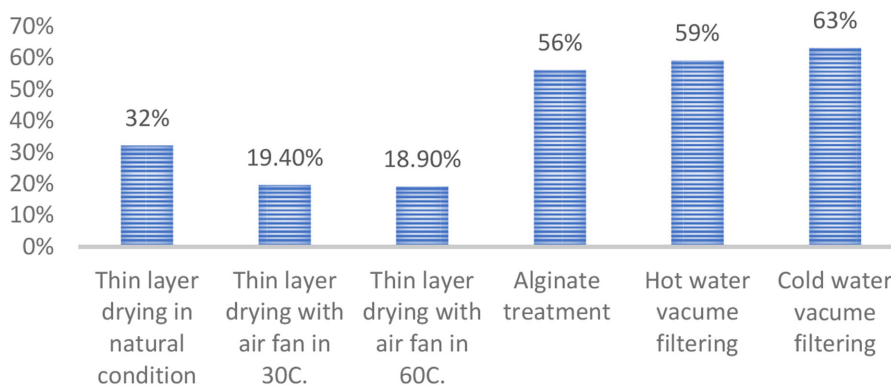


BSG water content is a variation of brewhouse procedures, and the type of work produced in the brewhouse, BSG is around 80 - 85 %. Dry BSG content has around 60-63% hemicellulose, cellulose and lignin, protein content is around 22-25%, lipids 8-9%, phenolic compounds 1.7-2%, ash 2.5% (Stefani & Co brewery).

**Table 3.** Summarized experimental results taken after different stabilization methods applied

Stabilization method used	Final moisture content (Initial moisture content 82%)	BSG life
Thin layer drying in natural condition	32%	Around 3 weeks
Thin layer drying with air fan in 30 <sup>0</sup> C.	19.4%	No deterioration noticed after 2 months
Thin layer drying with air fan in 60 <sup>0</sup> C.	18.9%	No deterioration noticed after 2 months
Alginate treatment	56%	Around 2 weeks. The polymer creates a barrier pollution. Repeated lactic acid washing increases BSG life up to 7 weeks.
Hot water vacuum filtering	59%	3 weeks
Cold water vacuum filtering	63%	10 days

Source: Own research



**Graph 1.** BSG moisture contents after different pretreated techniques applied. Initial moisture content 82%

Source: Chemical Engineering Laboratory, FSHN, Tirana, Albania, 2023

## 2.4. Study of Thin Layer Drying Kinetics

The drying kinetics for BSG were conducted on aluminum foil trays where a drying fan device was used to remove the moisture. In regular intervals of time was measured by a digital balance sample weight loss. The thickness of the sample on each tray was around 1 cm and the air speed was around 1 m/s. The drying kinetics measured was the function of airflow velocities and temperatures applied (T = 30<sup>0</sup>C and T = 60<sup>0</sup>C).

Moisture ratio (MR) was found using the Fick's diffusion equation. As we can see from equation 1, the moisture ratio is a function of effective diffusivity ( $D_{eff}$ ) ( $m^2/s$ ), the characteristic dimension of the "thin layer" product (A), and the drying time (t). The linear form of this equation, (eq 2) allows us to find effective diffusivity and activation energy parameters. Effective diffusivity is a fundamental parameter in drying processes.

$$MR = \frac{8}{\pi^2} \exp - \frac{\pi^2 D_{eff} t}{A^2} \quad (1)$$

$$\text{Were, } A = \frac{\text{mass}}{\text{density} \times \text{surface}} = \frac{0.5}{589 \times 0.21} 0.004042 m$$

$$\ln MR = \ln \frac{8}{\pi} - \frac{\pi^2 D_{eff}}{A^2} t \quad (2)$$

The effect of temperature on moisture ratio was found based on the Arrhenius equation. The activation energy ( $E_a$ ) which is in our case the minimum energy needed to start the drying process is related to the Arrhenius equation with the effective diffusivity and temperature (eq 3).

$$D_{eff} = K \exp - \frac{E_a}{RT} \quad (3)$$

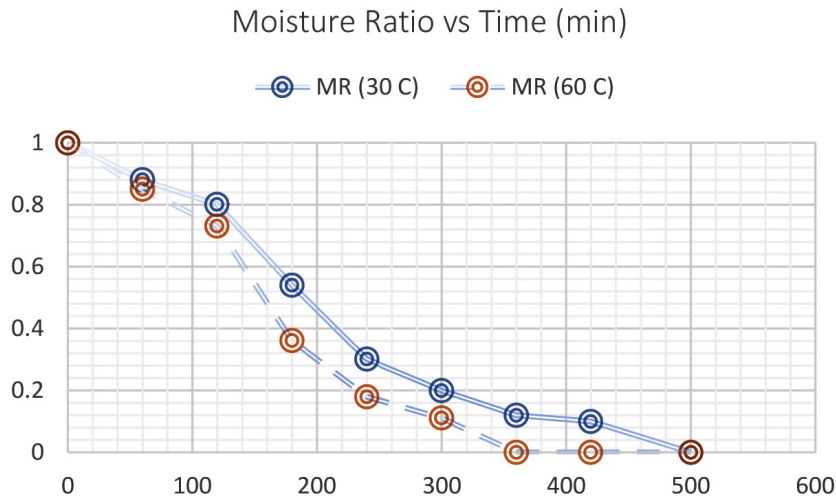
where:

K is a pre-exponential factor ( $m^2/s$ ).

$E_a$  is the activation energy of moisture diffusion (kJ/kmol).

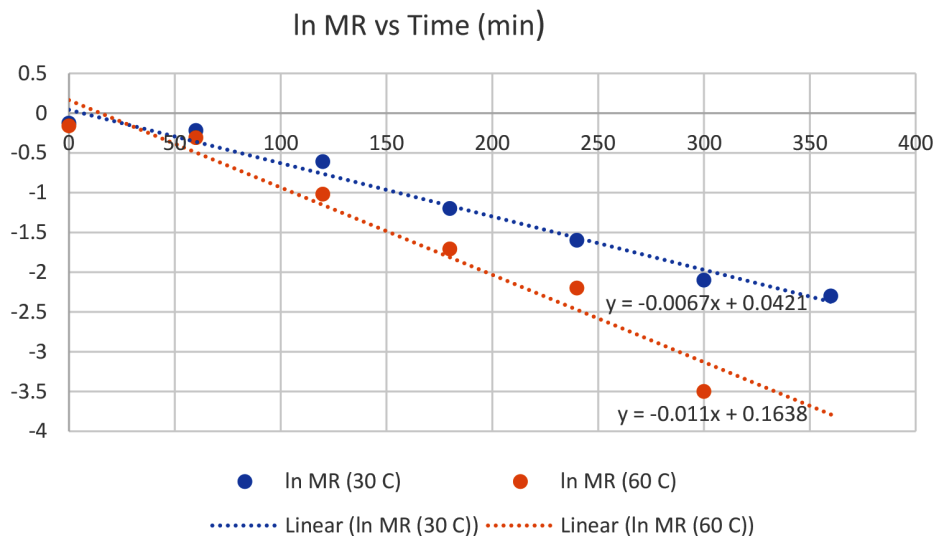
T is the absolute temperature of the air (K); R is the universal gas constant (8.314 kJ/(kmol K)).

Linear form of eq 3, allows us to determine pre-exponential factor and activation energy.



**Graph 2.** Moisture Ratio versus time for two different temperatures applied during thin layer drying procedures.

Source: Chemical Engineering Laboratory, FSHN, Tirana, Albania, 2023



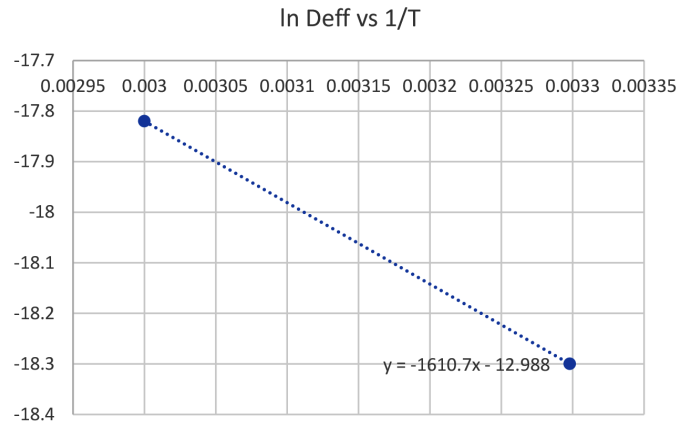
**Graph 3.** Linearization equations to calculate Effective Diffusion

Source: Chemical Engineering Laboratory, FSHN, Tirana, Albania, 2023

From linear equations in Graph 3, the slope is used to calculate effective diffusion.

$$D_{eff \text{ in } 30C} = 1.1 \times 10^{-8} m^2 s^{-1}$$

$$D_{eff \text{ in } 60C} = 1.81 \times 10^{-8} m^2 s^{-1} \quad (4)$$



**Graph 4.** Activation Energy calculation through the Arrhenius linear model

**Source:** Chemical Engineering Laboratory, FSHN, Tirana, Albania, 2023

Even though we have used only two different air temperatures it is obvious that effective diffusivity values are greater for higher temperatures. From the linear equation in Graph 4, we can calculate Activation Energy;  $E_a = 13.363 \text{ kJ/mol}$ .

### 3. FUTURE RESEARCH DIRECTIONS

Our future research work will be focused on exploring and proposing innovative technologies in utilizing BSG in the production of value-added compounds (xylitol, lactic acid), microorganisms' cultivation, or simply as raw material for extraction of compounds such as sugars, proteins, acids and antioxidants.

We intend to make the identification of microorganisms associated with BSG useful for further fermentation approaches.

Further research will consist of the valorization of spent grains for the extraction of bio compounds and/or the use as integrators/ingredients of food products with nutritional added value.

We intend to explore and set up also new BSG fermentation process and characterization of BSG fermented products and propose the reuse of these products in the food/feed industries.

### 4. CONCLUSION

BSG stabilization techniques can be employed as a function of their future destination. The vacuum filtering technique can lower moisture content by up to 60%. If we need a longer BSG life it is good to use the hot water vacuuming technique. The alginate treatment method is remarkably interesting if we are interested in using BSGs as food additives for humans and animals too. Acid washing can be applied to extend BSG's life. Drying techniques ensure a long BSG life and could be a solution for further use as a biofuel.

## References

- Aboltins, A., & Palabinskis, J. (2015). Research in brewer's spent grain drying process. *Engineering for Rural Development, Jelgava*, 20-22 May 2015.
- Amoriello, T., & Ciccoritti, R. (2021). Sustainability: Recovery and Reuse of Brewing-Derived By-Products. *Sustainability*, 13, 2355.
- Arranz, J. I., Miranda, M. T., Sepúlveda, F. J., Montero, I., & Rojas, C. V. (2018). Analysis of Drying of Brewers' Spent Grain. *Proceedings*, 2(23), 1467. <https://doi.org/10.3390/proceedings2231467>
- Ikram, S., Huang, L. Y., Zhang, H., Wang, J., & Yin, M. (2017). Composition and Nutrient Value Proposition of Brewers Spent Grain. *Concise Reviews & Hypotheses in Food Science, Journal of Food Science*, 82(10). <https://doi.org/10.1111/1750-3841.13794>
- Mallen, E., & Najdanovic-Visak, V. (2018). Brewers' spent grains: Drying kinetics and bio-diesel production. *Bioresource Technology Reports*, 1, 16-23. <https://doi.org/10.1016/j.biteb.2018.01.005>
- Mitri, S., Salameh, S.-J., Khelifa, A., Leonard, E., Maroun, R. G., Louka, N., & Koubaa, M. (2022). Valorization of Brewers' Spent Grains: Pretreatments and Fermentation, a Review. *Fermentation*, 8, 50. <https://doi.org/10.3390/fermentation8020050>
- Mussatto, S. I. (2014). Brewer's spent grain: A valuable feedstock for industrial applications. *Journal of Science and Food Agriculture*, 94(7), 1264-1275. <https://doi.org/10.1002/jsfa.6486>
- Rachwał, K., Waśko, A., Gustaw, K., & Polak-Berecka, M. (2020). Utilization of brewery wastes in the food industry. *PeerJ*, 8, e9427. <https://doi.org/10.7717/peerj.9427>



# The Recognition of the Right to a Healthy and Protected Environment in Europe and Romania

Gabriela A. Popoviciu<sup>1</sup>   
Mircea-Sebastian Manciu<sup>2</sup>   
Emanuela-Iulia Dragomir<sup>3</sup>   
Iuliu-Cristian Dragomir<sup>4</sup>

Received: August 19, 2023  
Accepted: November 22, 2023  
Published: March 16, 2024

## Keywords:

Right to a healthy and protected environment;  
Environmental policies;  
Clean environment



Creative Commons Non Commercial CC BY-NC: This article is distributed under the terms of the Creative Commons Attribution-Non-Commercial 4.0 License (<https://creativecommons.org/licenses/by-nc/4.0/>) which permits non-commercial use, reproduction and distribution of the work without further permission.

**Abstract:** *The present paper wants to bring more knowledge regarding the environment, the legislation regarding environmental conservation, as well as notions regarding ecology and environmental protection. The authors consider the topic exciting due to its topicality, expansion and importance, requiring extensive research and documentation, to assemble the knowledge necessary for its development. Environmental protection is a major issue of the last decade debated worldwide, a fact that has given rise to numerous disputes between developed and developing countries. Our environmental policies ensure a clean environment for the health of the country's inhabitants, decrease poverty and environmental damage, ensure economic growth for the benefit of current and future generations, and harmonize specific environmental legislation with that of the European Union. But, without behavioral transformations from human beings' side and our education in this sense, sustainable development can't be ensured.*

## 1. INTRODUCTION

The present paper talks about what sustainable development entails. In other words, we will refer to the protection of the environment, but also to the conditions of environmental protection in order to ensure sustainable development, in terms of legislation and human behavior. Of course, it is not unimportant that, after joining the European Union (EU), we faced new requirements, as a legal regulation speaking. The existing requirements and exigencies at the level of the EU require a new approach to global environmental problems, from the point of view of the effects and pressure on the environment and all the consequences of socio-economic development. The Romanian state had to align itself with all this by changing not only the regulations in the field but also the behavioral changes of the citizens. We are aware of the fact that the right to a healthy environment is a legislative prerogative and an internationally recognized right. That's why modern society, which faces several development limits, requires finding effective mechanisms to implement the principles of sustainable development. In this sense, the formation of ecological responsibility is prefigured to be one of the essential factors in the process of building a sustainable society. The present paper aims to approach the subject in an interdisciplinary way, being practically open to the assimilation of ideas coming from various fields of activity, so that we can manage to offer new models of approach to the present debated subject. We will summarize both the conceptual, methodological and even legal aspects, which should become useful tools in the process of the sphere of behavioral transformation in order to preserve and support the sustainable development of the

<sup>1</sup> University of Oradea, Faculty of Environmental Protection, 26 Gen. Magheru Bld, 410048 Oradea, Bihor, Romania

<sup>2</sup> University of Oradea, Faculty of Constructions, Cadastre and Architecture, 4 B. St. Delavrancea Street, 410058 Oradea, Bihor, Romania

<sup>3</sup> University of Oradea, Faculty of Constructions, Cadastre and Architecture, 4 B. St. Delavrancea Street, 410058 Oradea, Bihor, Romania

<sup>4</sup> Bihor County Inspectorate, 11 Mihai Eminescu Street, 410010, Oradea, Romania

environment. Later, in this paper, the legal, conceptual and methodological issues are discussed in all complementary and fully integrated relationships, in order to capture as accurately as possible the interactions between these spheres, but also their relevance in terms of the development of appropriate strategies for ecological sustainability. We believe that it is the only way to ensure the viability of a phenomenon with certain socio-economic implications, a phenomenon likely to contribute both to the continuity of the characteristics of sustainable development as a whole, as well as to the intrinsic values of this field.

## **2. THE LEGAL, CONCEPTUAL AND METHODOLOGICAL ISSUES REGARDING THE LEGAL NATURE OF THE FUNDAMENTAL RIGHT TO A HEALTHY ENVIRONMENT**

The human right to a healthy and protected environment is a subjective right both universal (global, collective) and individual (Atapattu, 2018). It is considered to be a new right in the category of fundamental human rights, outlined above all and primarily at the international level.

Starting from the fact that human rights are effective only to the extent that they are declared by internal legislation as fundamental rights and are guaranteed in their exercise (so only if they are registered in the constitutional, legislative and judicial systems of each state), it is imposed in this sense, the correlation of internal and international regulations.

The analysis of the terminology, "the human right to a healthy and protected environment" is important due to the need to reflect as fully as possible in the name, both the content of this right and the extent of this content (Boyle, 2012, p. 613-642). In the specialized literature, there is no consensus regarding the name of this right, being frequently used names such as:

- *right to a healthy environment;*  
The motivation for this name is based on the argument that the fundamental right to a healthy environment is the premise for realizing the other fundamental rights, such as the right to life, health, physical and moral integrity, work, property, etc.; also, in this acceptance enters the existence of constitutional provisions regarding human rights stipulated in international treaties; the existence of fundamental obligations of the state to restore, protect and maintain the ecological balance (Vaarvastian, 2019).
- *right to a healthy and ecologically balanced environment;*  
For the motivation of this opinion, the starting point is the idea that the environment must be protected both to protect life and to ensure its quality, such a right leading to much wider protection than that which could result only from the right to health protection.
- *right to a quality environment;*
- *right to preserve the environment;*  
This wording is motivated in the sense that citizens' participation in environmental conservation has a double aspect, of right and of duty, as they are not only passive beneficiaries but also responsible for the preservation and protection of the environment.

The doctrine also uses other names such as: "right to a decent environment", "right to a safe environment", "right to a clean environment" (Farge, 2021; Vaarvastian, 2019), "right to a preserved environment", etc. (Boyle, 2012, p. 613-642).

We support the opinion that the present names only include content elements of this right, they do not have a general character, and their use may create inconsistency between form, name and content, due to the lack of generality. All the notions contained in the name of this right

are content elements of "protection" because without it, the environment disappears and consequently all the adjectives mentioned above disappear as names. For these reasons, we appreciate that the appropriate wording is "right to a healthy and protected environment".

Along with the general features of any fundamental right, the right to a healthy and protected environment also has many specific features that outline its personality, such as:

- it is a subjective right, closely related to each individual, collective, or population;
- has a positive character, the state being responsible for constitutional obligations, as well as the obligations included in the laws, which are made concrete by Law no. 137/1995, republished, regarding environmental protection;
- it is a fundamental right to a real and not ideal environment, which implies that this right must be protected to ensure ecological balance, quality and cleanliness, safety and decency of life;
- it is a fundamental right regulated for present and future generations, so it has a temporal character;
- has a predominantly preventive and not remedial nature (Halpern, 2021) of liability for ecological damage in the sense that the environment can be protected first of all, by means of preventive measures;
- the holder of the right to a protected environment is man, the individual;
- guaranteeing this right is mandatory, necessary both at the national and international level, due to the negative consequences that environmental degradation can have on life on Earth;
- it is a new fundamental right, which is part of the category of fundamental rights recognized relatively recently in national constitutions.

A first opinion in this sense is the one according to which, the fundamental right to a protected environment is a right of claim. This opinion is motivated by the fact that the constitutional texts do not only refer to the need to protect the environment but also establish the duties of the state in this area, which makes the right to a protected environment represent the citizens' debt to the state. This opinion is disputed, because it is considered that the obligation of the state to protect the environment corresponds to a right that cannot be a claim, and the resulting legal relationship is a relationship of constitutional law (public law) that cannot create obligations (civil private law), but only duties for the protection of the environment for both the state and the citizens.

In another opinion, it is considered that the right to a protected environment is a positive right and not a natural right because it creates the responsibility of the state and the citizens, equally, to preserve it.

The opinion that the right to a protected environment is a moral and not a legal right has also been defined; or it is known that a subjective right, if it is a moral right, is no longer a right.

We rally to the opinion that the right to a healthy and protected environment, like any fundamental right, is a subjective right that makes up, together with other subjective rights and correlative obligations, the legal status of the citizen.

We remind the readers in this regard:

- the anthropocentric theory (or of human finality) - believes that the only holder and beneficiary of this right is man, the individual;

- the cosmogonic theory - according to which the right to a healthy and protected environment belongs to nature, which includes man;
- the theory of the humanistic tendency - according to which the right to the environment exists only for man as a sole purpose, not for nature;
- the theory according to which the holders of this right are both the individual and the collective;
- the theory according to which the holders of the right to a healthy environment are the "peoples" and even the Earth.

Theories that do not consider man as the holder of the right to a healthy environment cannot be accepted in terms of law, because the holder of such a right, from a legal point of view, can only be man, because the subject of law can only be a natural or legal person. The protection of man requires the protection of the environment, the protection of which attracts by way of consequence the protection of the human being.

The Romanian Environmental Law, Law no. 137/1995 republished in 2000, provides in this sense in Art. 5 that: "the state recognizes the right of all persons to a healthy environment", therefore, both natural and legal persons are recognized as holders of the right to a healthy and protected environment ([Office of the United Nations High Commissioner for Human Rights, 2022](#)).

Both at the global level and at the regional and national level, the recognition of a new and fundamental human right, the right to a healthy and protected environment, is foreshadowed. In specialized literature, the recognition of such a right is almost unanimous, because even the current economic-social and legal realities highlight the major importance of such a right ([Center for International Environmental Law, 2018](#)).

In addition, the constitutional recognition of such a right is important for the economy ([Ionescu, 2003](#)), for environmental legislation, and in general for environmental protection policy ([Duțu, 2003, p. 217](#)).

In the foreign specialized literature, other consequences or implications of the consecration as a fundamental right, the right to a healthy and protected environment ([Office of the United Nations High Commissioner for Human Rights, 2021](#)), was invoked, such as: "achieving the right to property by establishing protection zones and by limiting the use of certain goods; the existence of the danger of giving priority to this right in relation to other fundamental human rights, even reaching an ecological dictatorship".

However, there are also realistic concepts according to which, the recognition of such a right would lead to the enrichment of fundamental human rights, as a natural consequence of economic - social, national and world development, the reality of this right actually representing an essential condition for the existence and fulfillment of the other rights fundamental as well as the emergence of other new rights.

Although both at the international and regional level, efforts were made to recognize such a right as a fundamental right, however, in foreign doctrine and international instruments, no consensus was reached on this issue.

Until the World Conference in Rio de Janeiro in 1992, no international instrument contained an express recognition of such a human right. It cannot be said, however, that there were no



attempts, recalling in this sense the Declaration on the Environment, adopted at the UN Conference from Stockholm in 1972, which proclaims the principle according to which, "man has a fundamental right to freedom, equality and satisfactory living conditions, in an environment whose quality allows him to live in dignity and well-being".

Also, the World Charter of Nature, a document approved by the Resolution of the UN General Assembly in 1982, specifies the obligation of states, authorities and citizens regarding the need to keep the environment in good condition, clean, able to ensure appropriate physical and mental development (UN News, 2022).

The African Charter of Human and Peoples' Rights (African Convention on Human Rights, 1975, p. 187), implicitly recognizes (in Art. 24) the right to "a satisfactory and global environment", as a right of all peoples. The additional protocol from 1988 of the European Convention on Human Rights stipulates in Art. 11 that: "everyone has the right to live in a healthy environment and to benefit from essential public services" (World Economic Forum, 2021).

The creation of the World Commission on the Environment, led by G.H. Brundtland, adopted the report "Our future of all" in which it was stated that "all human beings have the fundamental right to an environment sufficient to ensure their health and well-being", pollution being considered a crime against humanity.

For these reasons, the opinion was created of the need for the express recognition of the fundamental human right to a healthy and protected environment in the international instruments with binding legal force, because only in this way could a new dimension (philosophical and legal) be given, both to the protection of the environment as well as international relations. It is appreciated in the directive that such recognition could be achieved through a declaration proclaiming and formulating such a right, which will later serve for the adoption of an international document with binding force.

The first attempt to expressly recognize the right to a healthy and protected environment is, as we have shown, the Rio Declaration, adopted at the 1992 Ecological Summit in Rio de Janeiro. Although this document proclaims in 1<sup>st</sup> article the fact that people have the right to a healthy and productive life in harmony with nature, it does not have the binding force necessary to solve this particularly complex problem.

The Constitution of the European Union (2004) establishes in Art. 3 that one of the objectives of the Union is the achievement of a high level of protection and improvement of the quality of the environment.

There are legal systems of some states that have expressly recognized such a right in their constitutions, or only in their laws.

Next, we present some constitutions of the states of the world, in which the recognition of the fundamental right is expressly regulated, under different names.

The Constitution of Portugal from 1976, amended in 2005 establishes in article 66 that "all persons have the right to a humane, healthy and ecological, balanced environment", establishing at the same time the obligation to protect it. The Portuguese constitutional provisions create the possibility of legal action in order to protect against environmental degradation (Cooper, 2021).

**The Constitution of Spain from 1978 (1978/2011)** expressly provides in art. 45 that: "Everyone has the right to enjoy an environment suitable for the development of their personality and they have the duty to protect it".

Corresponding to this right, the obligation of the state and citizens to protect the environment and its natural resources is also regulated.

Such a right is expressly enshrined in the constitutions of some South American countries (**The Constitution of Peru, 1993**). Also, many states in Eastern Europe have recognized in the constitutions adopted since 1990 the fundamental right to a healthy environment, correlated with the obligation of citizens to protect it and with the state's responsibility in this regard.

**The Constitution of the Russian Federation from 1993, last amendment 2020 (1993/2020)** provides in art. 42 that: "Every person shall have the right to a favorable environment, reliable information about the environment and compensation for damage to health and property caused by ecological crimes".

Although in **the US Constitution (1993)** there are no express provisions regarding the recognition of this right, some federal states within them include such provisions. Even though **the Constitution of Canada (1982)** did not recognize such a fundamental right at the federal level, there is a proposal for a ferenda law imposed by the definite usefulness of the right to a quality environment.

Although most of the world's states have not expressly regulated such a fundamental right through their constitutions, it is recognized implicitly, either by establishing fundamental duties for the state and citizens, or in the case of federal states by distributing the powers provided in their constitutions in the field of environmental protection between federal states.

We believe that, along with fundamental rights, there are also non-fundamental subjective rights that have their origin in constitutions or laws and that cannot enjoy the practice of such rights. Thus, the constitutional regulation of the state's obligation to protect the environment cannot have the effect of recognizing a fundamental right to a healthy and protected environment, but only a subjective right of constitutional origin.

In relation to the second way of implicit recognition of the fundamental right to a healthy environment, namely that of the distribution by the constitutions of the federal states of their attributions between the federal state and the federations, it is considered that the problems related to this right are so the competence of the federal state as well as the federated states that will take the necessary measures in this regard.

We believe that the express recognition of the fundamental right to a healthy and protected environment is largely determined by the existence of appropriate economic and social conditions in a society this right once recognized, determines the necessity of its implementation and confers the right to formulate actions in justice for those in the right.

The legislative recognition of such a right is found in many legal systems and refers exclusively only to situations when this is done by law, so when the right to a healthy and protected environment is recognized only as a subjective right and not as a fundamental right. In the USA (**Office**

of the United Nations High Commissioner for Human Rights, Fact Sheet No. 38, 2021; Office of the United Nations High Commissioner for Human Rights, 2021), for example, the National Environmental Policy Law adopted at the federal level, provides as follows in art. 101: "Congress recognizes that every person must enjoy a healthy and protected environment", establishing obligations and responsibilities both for the state and for the population, in order to protect and develop the environment (Center for International Environmental Law, 2022). In Norway, the Environmental Protection Act of 1981 and in Denmark the Environmental Protection Act of 1973, aim to ensure a quality environment necessary for human health and well-being, correlated with the maintenance of biodiversity. Also, in countries such as the Philippines, Indonesia, Venezuela, and New Zealand, environmental laws state (Guzman, 2018) that the objective of environmental policy is to improve quality, establishing in this sense rights for individuals and correlative obligations for them and the state (Human Rights Watch, 2018).

In the doctrine, there is a judicial recognition of the right to a healthy and protected environment, which otherwise represents a new form of protection of this right. Internally, the protection of the environment can be invoked at the Tribunals and Constitutional Courts, and externally, before the Human Rights Commission and the Human Rights Court (Office of the United Nations High Commissioner for Human Rights, 2020, 2022).

In Italy, for example, the courts sanction the shortcomings regarding the obligation to preserve the environment. Irish jurisprudence considers that there is a limited subjective right not to be polluted, while Canadian jurisprudence attempts a favorable interpretation of the legal recognition of the right to the environment, showing some hesitation regarding the severity of the penalty (UN Formal Recognition, 2021).

We believe that, in the context of the evolution of the realities, the indirect recognition of this right has been reached, through judicial practice which, on the one hand, took into account the environmental dimension as an inseparable part of the protection of fundamental human rights, and on the other hand, by establishing some obligations for states and citizens, motivated by the need to protect the environment.

In the Constitution of Romania from 1991 updated, the fundamental human right to a healthy and protected environment was not expressly recognized, being established in the charge of the state, through the provisions of art. 134 al. 2 letter c. duties regarding "restoring and protecting the environment as well as maintaining the ecological balance", and by letter f. of the same article, "creating the necessary conditions for increasing the quality of life" (The Constitution of Romania, 1991 updated).

We believe that, through this regulation, a fundamental right to a healthy and protected environment has been established indirectly, by establishing an obligation for the state.

Environmental protection law no. 137/1995, republished, enshrines in art. 5, "the right of all people to a healthy environment, guaranteeing in this sense:

- a. access to information regarding the quality of the environment, in compliance with the confidentiality conditions provided by the legislation in force;
- b. the right to associate with environmental quality defense organizations;
- c. the right of consultation in order to make decisions regarding the development of environmental policies, legislation and norms, the issuance of environmental agreements and authorizations, including for territorial development and urban planning plans;

- d. the right to address, directly or through an association, the administrative or judicial authorities in order to prevent or in the event of direct or indirect damage;
- e. the right to compensation for the damage suffered."

The law also correlates the environmental protection obligations of natural and legal persons, of central and local administrative authorities, as well as responsibilities in this sense, for central authorities and territorial agencies for environmental protection.

For these reasons, it is necessary to first of all create the necessary conditions and then to constitutionally expressly recognize the fundamental human right to a healthy and protected environment.

The current constitution of Romania expressly recognizes the fundamental human right to a healthy environment through art. 35, as follows: "The state recognizes the right of any person to a healthy and ecologically balanced environment" ([The Constitution of Romania, 1991](#)). In this way, obligations are established for the state to ensure the legislative framework for the exercise of this right, as well as obligations for individuals to protect and improve their living environment.

Sustainable development includes environmental protection, and environmental protection conditions sustainable development ([Office of the United Nations High Commissioner for Human Rights, 2021](#)). The existing requirements and exigencies at the level of the European Union impose a new approach to global environmental problems, from the point of view of the effects and pressure on the environment and all the consequences of socio-economic development.

Modern society, facing its own development limits, requires finding effective mechanisms to implement the principles of Sustainable Development. The key issue of sustainable development is the reconciliation between two human aspirations: the need to continue economic and social development, but also the protection and improvement of the environment, as the only way for the well-being of both present and future generations.

To develop sustainably, all countries need access to and improvement in the use of clean technologies that waste fewer resources ([Farge, 2021](#)).

Still, analyzing the development-conservation-sustainability-environment relationship, we can affirm the existence of some current crises: the first, that of environmental conservation, the second, of the evolution of techniques to help people's work and livelihood, therefore implicitly the right of people to a healthy environment. This includes conservation strategies and realization of the human right to a healthy environment. Of course, the summary meaning of ethics is very close to that of morality, which, as we know very well, is nothing but a conduct imposed by man in order to achieve a better and cleaner development.

### 3. CONCLUSION

Based on the above-presented data the following conclusions can be drawn:

- The concept of sustainable development designates all the forms and methods of socio-economic development, the foundation of which is ensuring a balance between these socio-economic systems and the elements of natural capital. The most well-known definition

of sustainable development (Duțu, 2003) is the one given by the World Commission for Environment and Development in the report "The Common Future", also known as the Brundtland Report. Thus: "sustainable development is the development that seeks to satisfy the needs of the present, without compromising the possibility of future generations to satisfy their own needs". Such a definition can be understood that through sustainable development we seek and try to find a stable theoretical framework for decision-making in any situation where there is a human/environment relationship, whether this relationship refers to the environment or the economic or social one.

- Although man has built a state of anthroposphere throughout his existence that does not overlap perfectly with the biosphere, many times even acting against them, nowadays man has an intrinsic right to a healthy environment. This right is recognized in all constitutions of the world, including the Declaration of Human Rights. As such, a century after the beginning of the legislative activity to protect nature, we have a broad vision of the necessity for man to be an integrated part of the surrounding nature, because only in this way will nature be able to sustain and benefit future generations. Man has the right to be part of the natural heritage available to the Earth. It is part of the definition and concept of sustainable development because it is recognized as a principle of evolution of modern society.
- The goals and interests of nature conservation worldwide are multiple. Thus, on the one hand, there are elements with an obvious documentary, landscape and touristic purpose, on the other hand, those for which scientific or economic interest predominates. It is well known, for example, that a volcano, a waterfall, or other such phenomenon is much more interesting for tourism than a forest or a meadow. Therefore, the interpretation of each of the above purposes must be analyzed individually. But this is not the purpose of this work. But, rather, of the inclusion of man in the group of objectives that must be protected. Because man himself has this right, to be part of biodiversity. In other words, human cultural diversity, as well as the biodiversity component, human cultural factors - such as transhumance, traditional agriculture, etc., represent a system of living in a given environment. The wealth of cultural systems based on language, agricultural practices, religion, and common and/or complementary artistic forms confers cultural diversity in an area. This is the reason why human integration in natural data is best reflected in such a system. It is, in other words, and by analogy, the human right to exist in a healthy environment. The Human Right to a Healthy Environment is reduced to this.
- The lack of an institutional and legislative system based on sustainable development led and continues to lead to the destruction of habitats and the decrease of biodiversity. In many countries, the concept of sustainable development was not well understood as a higher level of intersectoral integration of economic development, within the limits of the support capacity of the territory considered, a fact that led to wrong exploitations. In this regard, we can give some examples even from our own country: the destruction of the Danube Meadow in order to obtain sustainable agricultural production, a wrong thing because this did not happen, but it led to the destruction of the existing biodiversity in that place, so implicitly it was also affected the human right to a healthy and sustainable environment. Another example is the cutting of the forest curtains that were supposed to increase the agricultural areas, but which in the end only "helped" soil erosion, the loss of crops and much greater investments in technologies to conduct the water necessary for the survival of crops. And the examples could go on. What should be emphasized here is the fact that, as a result of the lack of legislation in this field, as well as the misunderstanding of the concept of nature conservation, of its sustainability, we are in a situation where human micro-communities have been affected, being forced to their dissipation and

dislocation in the areas affected by this kind of works that have proven to be in contradiction with the area and the life in that area.

- Making an analogy with the debated topic, we will say that environmental sustainability, the right to a healthy environment must be at the center of economic and political decisions at the global and national level alike. For this, it is required that the interested public participates in the decision-making process in the matter at all levels and, therefore, access to information. It is no coincidence that, for this reason, the Single European Act has as its main community objectives: environmental protection, human health and the prudent and rational use of natural resources. This means that the environment is integrated into the definition and implementation of all economic and social policies of the EU, including energy, trade, industry, agriculture, transport and tourism. Of course, the diversity of situations in the different regions of each country is taken into account. In this context, the harmonization measures that correspond and respond to the requirements in the field of environmental protection assume a safeguard measure that authorizes the member states to take, for reasons of environmental protection, provisional measures of no economic nature.

## References

- African Convention on Human Rights. (1975). *Earth Law Journal*, Vol. I, Leyde, pp.187.
- Atapattu, S. (2018). The Right to a Healthy Environment and Climate Change: Mismatch or Harmony? In J. Knox & R. Pejan (Eds.), *The Human Right to a Healthy Environment* (pp. 252-268). Cambridge: Cambridge University Press. doi:10.1017/9781108367530.014
- Boyle, A. (2012). Human Rights and the Environment: Where Next. *European Journal of International Law*, 23(3), 613-642. ISSN 0938-5428, doi:10.1093/ejil/chs054 (accessed on 20.02.2023).
- Center for International Environmental Law. (2018). The time is now for the UN to formally recognize the right to a healthy and sustainable environment (accessed on 20.02.2023).
- Center for International Environmental Law. (2022). UNGA recognizes right to a healthy environment, signalling a new era of rights-based environmental policy (accessed on 12.03.2023).
- Cooper, N. (2021). *How the new human right to a healthy environment could accelerate New Zealand's action on climate change*. The Conversation (accessed on 05.03.2023).
- Duțu, M. (2003). Dreptul mediului. Tratat, abordare integrată. Vol. I. Ed. *Economică*, București, pp. 217.
- Farge, E. (2021). UN declares access to a clean environment a human right (accessed on 12.03.2023).
- Guzman, D. (2018). *In historic ruling, Colombian Court protects youth suing the national government for failing to curb deforestation*. Dejusticia.
- Halpern, G. (2021). Rights to Nature vs. Rights of Nature (accessed on 20.02.2023).
- Human Rights Watch. (2018). The Case for a Right to a Healthy Environment (accessed on 20.02.2023).
- Ionescu, C. (2003). Constituția României, legea de revizuire comentată și adnotată cu dezbateri parlamentare (The Constitution of Romania, the revision law commented and annotated with parliamentary debates). Ed. All Beck, București.
- Office of the United Nations High Commissioner for Human Rights. (2022). *Historic day for human rights and a healthy planet: UN expert* (accessed on 20.02.2023).
- Office of the United Nations High Commissioner for Human Rights. (2021). *Good practices on the right to a healthy environment* (accessed on 20.02.2023).

- Office of the United Nations High Commissioner for Human Rights. (2021). *Fact Sheet No. 38: Frequently Asked Questions on Human Rights and Climate Change*, United Nations, Geneva and New York, March, ISSN: 1014-5567 / eISSN: 1564-8974.
- Office of the United Nations High Commissioner for Human Rights. (2021). *Frequently asked questions on human rights and climate change* (pdf) (accessed on 12.03.2023).
- Office of the United Nations High Commissioner for Human Rights. (2020). Speaker Marta Hurtado: *Colombia: Human rights activists' killings* (accessed on 20.02.2023).
- Office of the United Nations High Commissioner for Human Rights. (2022). *General Assembly of the United Nations* (accessed on 12.03.2023).
- The Constitution of Canada. (1982).
- The Constitution of the European Union. (2004).
- The Constitution of Peru. (1993).
- The Constitution of Portugal. (1976, last amendment 2005).
- The Constitution of Romania, 1991 updated. (1991). (accessed on 12.04.2023).
- The Constitution of the Russian Federation. (1993, last amendment 2020).
- The Constitution of Spain. (1978, last amendment 2011).
- The US Constitution. (1993) (accessed on 12.04.2023).
- UN Formal Recognition. (2021). *Human right to a healthy environment* (accessed on 05.03.2023).
- UN News. (2022). *UN General Assembly declares access to clean and healthy environment a universal human right* (accessed on 20.02.2023).
- Vaarvastian, S. (2019). *The human right to a clean and healthy environment in climate change litigation*, Rochester, NY, SSRN: 3369481 (accessed on 05.03.2023).
- World Economic Forum. (2021). *Why having a clean and healthy environment is a human right?* (accessed on 05.03.2023).

### Additional reading

- The Hungarian Constitution. (1990).
- The Constitution of Brazil. (1988).
- The Constitution of Bulgaria. (1991).
- The Constitution of Chile. (1991).
- The Constitution of Croatia. (1991).
- The Constitution of Moldova. (1994).
- The Constitution of Paraguay. (1992).
- Shelton, D. (2022). *Human Rights, Health & Environmental Protection: Linkages in Law & Practice*. Health and Human Rights Working Paper Series No 1. World Health Organization.
- Vlaicu, V. (2007). *Probleme ale protecției mediului în procesul realizării unor drepturi și obligații constituționale*. Teză de doctorat (Problems of environmental protection in the process of realizing some constitutional rights and obligations. Ph.D. Thesis), Chișinău, 2007, pp. 25-26.







# Short Considerations Regarding the European and Romanian Legislation on the Recovery of Municipal and Similar Waste in Energy Recovery Incineration Plants

Cliza Marta-Claudia<sup>1</sup> 

Spataru-Negura Laura-Cristiana<sup>2</sup> 

Received: August 27, 2023

Accepted: February 26, 2024

Published: March 16, 2024

## Keywords:

Energy;  
Incineration plants;  
Municipal waste;  
Recovery;  
Romania



Creative Commons Non Commercial CC BY-NC: This article is distributed under the terms of the Creative Commons Attribution-Non-Commercial 4.0 License (<https://creativecommons.org/licenses/by-nc/4.0/>) which permits non-commercial use, reproduction and distribution of the work without further permission.

**Abstract:** *The scope of this study is to make a summary presentation of the aspects concerning the Romanian regulation on the recovery of municipal and similar waste in energy recovery incineration plants. The authors underline that, just like the European legislation, Romanian national legislation supports and encourages recovery operations, so that the waste is used as much as possible, including for obtaining electricity and/or thermal energy, and the quantity of municipal waste disposed in waste storage facilities is reduced as much as possible. One of the targets required by the Romanian National Waste Management Plan, was that the quantity of stored municipal waste to be reduced to a maximum of 10%, until 2030, Romania being granted the opportunity to benefit from an additional five-year term, provided that all measures required in order to reduce the quantity of stored municipal waste to 20% of the total quantity of generated waste are implemented until 2030. NWMP also provides that one of the priorities of Romania in what concerns waste management and prevention is encouraging the production of energy from waste that cannot be recycled, by providing at the same time that the incineration of municipal waste with energy recovery is a very used and well-known technology.*

## 1. INTRODUCTION

Human rights education has recently become one of the main themes of international human rights law (Alfredsson, 2001, Mihr, 2004). The importance of knowing and promoting human rights is more than paramount in these times.

Besides the civil and political rights, we must focus our attention on solidarity rights (as third generation rights, which imply rights of a collective nature linked to the existence and organisation of a community and which require the contribution of the entire international community for their realization) such as the right to self-determination, the right to peace and security, the right to a healthy environment, the right to development.

Instruments such as the European Convention on Human Rights are constantly evolving, the reason for which it also indirectly recognized the right to a healthy environment (indirect protection, by ricochet, since pollution or degradation of the environment does not constitute direct violations of the right to private life), which involves the protection of health.

Thus, **the right to a healthy environment** even if not in terminis guaranteed by the international treaties, derives from the right to respect for the private and family life. In this respect, the international courts of law have held that the following constitute interference with the right to

<sup>1</sup> Faculty of Law, “Nicolae Titulescu” University, Calea Vacaresti no. 185, zipcode 040051, district 4, Bucharest, Romania

<sup>2</sup> Faculty of Law, “Nicolae Titulescu” University, Calea Vacaresti no. 185, zipcode 040051, district 4, Bucharest, Romania

private life from the perspective of the right to enjoy a healthy environment: noise pollution due to heavy air, rail and road traffic, nightclubs in residential buildings, industrial premises in the vicinity of people's homes, chemical pollution. As regards the European Convention on Human Rights, please note that for environmental damage to constitute a breach of Article 8 of the Convention, there must be an “*adverse effect on a person's private or family life and not merely a general deterioration thereof*”, according to [Birsan \(2010, 644\)](#).

States have several positive obligations: to take appropriate legislative or administrative measures to protect the environment against pollution, and the obligation to provide the persons concerned with information on the possible risks of hazardous activities<sup>3</sup>. In such cases, the Court examines whether the public authorities have struck a fair balance between the right of a person to respect private and family life and the economic well-being of the State concerned (the so-called fair balance test).

Interestingly, [Boroi \(2016\)](#) speaks of “a primacy over all other fundamental rights” of the right to a healthy environment - even over the right to life. This is possible because the right to a healthy environment goes beyond the right to life: “[a]lthough it cannot be accepted that future generations already have a right to life, there is nevertheless an obligation on the part of present generations to protect the environment in such a way as not to compromise the life expectancy of those who follow”.

Because nowadays there is a huge interest in Romania and Europe regarding the recovery of municipal and similar waste in energy recovery incineration plants, we thought that the Romanian example would be great to be presented, since we consider that the lawmaking and law enforcement by the Romanian authorities would be a positive example.

## 2. REGULATION IN ROMANIA OF THE RECOVERY OF MUNICIPAL AND SIMILAR WASTE IN ENERGY RECOVERY INCINERATION PLANTS

### A. Regulation of the Waste Incineration Plant

First of all, in what concerns **the classification of waste incineration plant**, the provisions of **art. 3** of Law no. 278/2013 on industrial emissions (hereinafter “**Law no. 278/2013**”) stipulate the following **definitions** relevant to this study:

*“jj) waste incineration plant – any stationary or mobile technical equipment or unit intended for thermal treatment of waste, with or without recovery of the heat generated, by incineration by means of oxidation, as well as by any other thermal treatment process, such as pyrolysis, gasification or plasma processes, provided that the substances resulting from the treatment are subsequently incinerated;*

*kk) waste co-incineration plant - any stationary or mobile technical unit the main scope of which is energy generation or the production of materials or which uses waste as usual or additional fuel or in which waste is thermally treated in order to be removed by incineration by means of oxidation, as well as by other thermal treatment processes, such as pyrolysis, gasification or plasma process, provided that the substances resulting from the treatment are subsequently incinerated.”*

<sup>3</sup> See the case of *Tatar v. Romania* (application no. 67021/01), judgment of 27.01.2009, para. 88.

In a similar manner, according to the provisions of **art. 42 para. (5)** of Law no. 278/2013:

*“Provided that waste co-incineration process takes place so that the **main scope** of the plant is not the production of energy or materials, but waste thermal treatment, the plant shall be considered to be a waste incineration plant”.*

In relation to these legal provisions and technical features, the **exact classification of the plant is to be established (incineration or co-incineration plant).**

**Secondly, plant operator** is, according to the provisions of **art. 3 letter o)** of Law no. 278/2013:

*“any natural person or legal entity that **exploits or holds total or partial control** over the plant or combustion plant or waste incineration plant or waste co-incineration plant or, as provided by the national legislation, **to whom/which was delegated the final economic power over the technical operation of the plant**”.*

**Thirdly**, according to the provisions of **art. 44 para. (1)** of Law no. 278/2013, **the operation of waste incineration or co-incineration plants:**

*“shall be performed based on **the integrated environmental permit or the environmental permit, as the case may be**”, issued by the competent environmental authorities (**art. 3 letter g), g1) and g2)** of Law no. 278/2013).*

According to the provisions of **item 5.2. of Appendix 1** to Law no. 278/2013, for the activity *“disposal or recovery of waste in waste incineration plants or waste co-incineration plants: a) in case of non-hazardous waste, with a capacity of over 3 tons per hour; b) in case of hazardous waste, with a capacity of over 10 tons per day”* the **integrated environmental permit is required.**

**Last but not least**, please note that **special provisions** on waste incineration plants and waste co-incineration plants are found in **Chapter IV** of Law no. 278/2013, respectively in **art. 42 – art. 55** of Law no. 278/2013.

## **B. Regulation of Municipal and Similar Waste**

In what concerns *“municipal waste”*, according to the provisions of **art. 2 para. (4) item 6** of Law no. 101/2006 on localities sanitation service (hereinafter *“Law no. 101/2006”*) and **item 13 of Appendix no. 1** to Government Emergency Ordinance no. 92/2021 (hereinafter *“GEO no. 92/2021”*), this shall mean:

*„a) mixed waste and waste collected separately from households, including paper and cardboard, metals, plastics, biowaste, wood, textile fabrics, packaging, waste of electric and electronic equipment, waste of batteries and accumulators and bulky waste, including mattresses and furniture;*

*b) mixed waste and waste collected separately from other sources, if the respective waste is similar in nature and composition to household waste.*

*Municipal waste shall not include waste from production, agriculture, forestry, fishing, septic tanks and the sewage and treatment network, including sewage sludge, end-of-life vehicles or waste from construction and demolition activities.*

*This definition also applies if waste management responsibilities are shared between public and private actors”.*

Furthermore, in what concerns “**similar waste**”, according to the provisions of **art. 2 para. (4) item 7** of Law no. 101/2006 and **art. 1 para. (2) of the Commission Decision** of 18 November 2011 establishing rules and calculation methods for verifying compliance with the targets set in Article 11 (2) of Directive 2008/98/EC of the European Parliament and of the Council (hereinafter the “**Commission Decision 2011/753/EU**”), this shall mean:

*“waste in nature and composition comparable to household waste, excluding production waste and waste from agriculture and forestry”.*

**Territorial and administrative divisions** (hereinafter referred to as “**TAD**”) have the capacity of **legal holder of municipal waste and similar waste**, stored in containers located in their territorial area (**art. 2 para. (9)** of Law no. 101/2006).

### **C. General Regulations on the Recovery of Municipal and Similar Waste by Incineration**

**Beforehand**, we note that, just like the European legislation, **Romanian legislation supports and encourages recovery operations**, so that the waste is used as much as possible, including for obtaining electricity and/or thermal energy, and the quantity of municipal waste disposed in waste storage facilities is reduced as much as possible.

One of the targets required by the Romanian National Waste Management Plan, approved by Government Resolution no. 942/2017 (hereinafter the “**NWMP**”) was that **the quantity of stored municipal waste to be reduced to a maximum of 10%**, until 2030, Romania being granted the opportunity to benefit from an additional five-year term, provided that all **measures required in order to reduce the quantity of stored municipal waste to 20% of the total quantity of generated waste** are implemented until 2030. The NWMP also provides that one of the priorities of Romania in what concerns waste management and prevention is **encouraging the production of energy from waste that cannot be recycled**, by providing at the same time that the incineration of municipal waste with energy recovery is **a very used and well-known technology**.

This scope is related to the **obligation** provided by **art. 8 para. (5)** of the Government Ordinance no. 2/2021 on waste storage (hereinafter “**GO no. 2/2021**”), namely:

*“Central public administration authority for environmental protection (i.e. Ministry of the Environment) **adopts the required measures so that, until 2035, the total quantity, denominated in tons, of municipal waste annually disposed in waste storage facilities is reduced to 10% or less of the total generated municipal waste**”.*

Furthermore, according to **art. 7 para. (1)** of GO no. 2/2021, central public administration authority for environmental protection (namely the Ministry of the Environment) should **propose**

**appropriate measures** in order to promote the reuse of products and the activities intended for their preparation for reuse purposes, so that, starting with 2030 **no waste that can be recycled or otherwise recovered, especially when it comes to municipal waste, is accepted in waste storage facilities**, except waste for which disposal in waste storage facilities has the best outcome for the environment, according to art. 4 of Directive 2008/98/EC.

In accordance with Directive 2008/98/EC, the provisions of **art. 4 para. (1)** of GEO no. 92/2021 require **a waste hierarchy**, which shall apply **as a priority** order in waste prevention and management legislation and policy of Romania:

- a) *prevention*;
- b) preparing for reuse;
- c) *recycling*;
- d) *other recovery, such as energy recovery*;
- e) *disposal*.

Furthermore, the scope of applying waste hierarchy provided for by art. 4 para. (1) is **to encourage the options that deliver the best overall outcome** in what concerns the environment and health of the population (**art. 4 para. (2)** of GEO no. 92/2021).

Moreover, for certain specific waste stream, **the application of waste hierarchy may undergo changes** based on the life cycle analysis regarding the global effects of the generation and management of such waste (**art. 4 para. (3)** of GEO no. 92/2021).

Finally, according to the provisions of **art. 21** of GEO no. 92/2021, waste management must be carried out **without endangering the health of the population and without harming the environment**, especially:

- a) without generating risks of contamination for air, water, soil, fauna or flora;
- b) without creating discomfort due to noise or smells;
- c) without adversely affecting landscape or areas of special interest.

**It is prohibited** to incinerate separately collected waste for preparation for reuse and recycling, **except for** waste from further treatment operations of separately collected waste, for which incineration is the optimal outcome from an ecological point of view, in accordance with art. 4 (**art. 16 para. (3)** of GEO no. 92/2021).

The original waste producer or, as the case may be, any waste holder shall **be bound to perform treatment operations in accordance with the provisions of art. 4 para. (1) - (3) and art. 21** by own means or by means of an authorized economic operator that carries out waste treatment activities or of a public or private waste collecting operator, in accordance with the provisions of art. 4 para. (1) - (3) and art. 21 of GEO no. 92/2021 (**art. 23 para. (1)** of GEO no. 92/2021).

On the other hand, according to the provisions of **art. 8 para. (2) letter a)** of GO no. 2/2021, municipal waste storage is allowed in non-hazardous waste storage facilities, in accordance with para. (6), and according to the provisions of **art. 8 para. (6)** of the same normative act, the **storage** of waste, according to the provisions of para. (1) and (2), **is allowed only if waste is previously subject to technically feasible treatment operations** which contribute to the fulfillment of the scopes referred to in GO no. 2/2021.

The term “**treatment**” includes the operations of recovery or disposal, including preparation performed before recovery or disposal (item 32 of Appendix no. 1 to GEO no. 92/2021).

According to the provisions of item 36 of Appendix no. 1 to GEO no. 92/2021, “**recovery**” means any operation the main outcome of which is that the waste serves a useful scope by replacing other materials which would have been used for a specific purpose or that the waste is prepared to serve the respective purpose, within companies or economy in general.

Appendix no. 3 to GEO no. 92/2021 establishes a list of recovery operations, a list which is not exhaustive. This list provides operations **R1 – The use mainly as a fuel or as another source of energy**, which includes incineration plants intended mainly for the treatment of municipal solid waste, only if their **energy efficiency is equal or greater than 0.65** for plants authorized after 31 December 2008.

By taking into account waste hierarchy (art. 4 para. (1) of GEO no. 92/2021) and the obligation to perform treatment operations before storage (art. 8 para. (6) of GO no. 2/2021), the activity of treating municipal waste with energy potential in incineration installations with high energy efficiency is **one of the options of treatment by recovery** that the territorial and administrative divisions are bound to perform for municipal waste, **with priority over the disposal in waste storage facilities**.

However, in practice, at the time being, most of the territorial and administrative units **have not included treatment by recovery of municipal waste in local sanitation system**, by proceeding directly to the direct disposal of waste in non-hazardous waste storage facilities (which sometimes operates in violation of the relevant legal provisions, namely in the absence of integrated environmental authorizations, ANRSC licenses, delegation contracts, etc.).

#### **D. Regulation of the Recovery of Municipal and Similar Waste by Means of Incineration, as a Component of Public Sanitation Service**

**Preliminary**, it is important to note that the provision of the services specific to sanitation service is governed by the **proximity principle**, according to which disposal and recovery of municipal waste must be performed **in the nearest appropriate plants and by means of the most suitable methods and techniques**, in order to ensure a high level of protection for the environment and public health (art. 25 para. (1) and (3) of GEO no. 92/2021).

In what concerns **regulation of the public sanitation service of localities**, Law no. 51/2006 represents the **general norm**, and Law no. 101/2006 is the **special norm**. Therefore, our analysis will firstly refer to general provisions and then to special provisions, specific to the activity.

**The public sanitation service of localities** falls under the scope of the community services on public utilities and is carried out under the **control, management or coordination** of the local public administration authorities of TAD or the intercommunity development associations, for the purpose of localities sanitation (art. 1 para. (2) letter e) of Law no. 51/2006 and art. 2 para. (1) of Law no. 101/2006).

Public utility services are established, organized and provided within communes, cities, municipalities, counties, Bucharest municipality and, as the case may be, under the terms of the law, at

the level of territorial and administrative subdivisions of municipalities or at the level of intercommunity development associations, **under the leadership, coordination, control and responsibility of the local public administration authorities (art. 1 para. (3) of Law no. 51/2006).**

According to the provisions of **art. 2 para. (3) of Law no. 101/2006**, sanitation service includes, among others the *treatment of municipal waste with energy potential in incineration plants with high energy efficiency, including the transport of residues resulting from incineration in waste storage facilities.*

Sanitation service is performed **by means of a sanitation system**, made up of goods in the public and private domain of TAD **and/or of the goods that represent the private property of the operators**, which are **included** in the county waste management plan, including the waste management plan for Bucharest municipality (**art. 4 para. (1) of Law no. 101/2006**).

Sanitation system is made up of technological and functional ensemble, which includes specific constructions, plants and equipment intended to provide sanitation service, such as **high energy efficiency incineration plants (art. 4 para. (2) letter j) of Law no. 101/2006**).

According to the provisions of **art. 22 para. (1) of Law no. 51/2006**, the local public administration authorities of TAD are **free to decide** on the way of managing the public utility services under their responsibility.

Public administration authorities have the **possibility to directly manage** public utility services based on a contracting out decision **or to entrust their management**, respectively all or only a part of the own competences and responsibilities regarding the provision of a public utility service or one or more activities within the scope of the respective public utility service, **based on a management delegation agreement.**

Therefore, in accordance with the provisions of **art. 22 para. (2) of Law no. 51/2006** and **art. 12 para. (1) of Law no. 101/2006**, sanitation service management is carried out in the following ways: **direct management** (based on a decision for contracting out sanitation activity/activities), and **delegated management** (based on the management delegation agreement).

**The choice of the management** of the sanitation service is performed under the decisions of the decision-making authorities of the TAD, in accordance with the sanitation strategies and programs adopted at the level of each locality, as well as in accordance with the provisions of Law no. 51/2006 (**art. 12 para. (2) of Law no. 101/2006**).

The legal relations between the territorial and administrative divisions/districts of Bucharest municipality or, as the case may be, intercommunity development associations and sanitation service operators shall be regulated by the decisions on the contracting out of the sanitation activity/activities or by means of management delegation agreements, as the case may be (**art. 13 of Law no. 101/2006**).

The local public administration authorities of TAD/districts of Bucharest municipality have **exclusive powers** in what concerns organization, assignment, coordination and control of the sanitation activities carried out in the territorial area of their competence and exercise, among others, **attributions regarding the following:**

- **to approve the inclusion** in the management delegation agreements and the contracting out decisions **of the performance indicators for waste management activities**, at the level provided in the technical specifications for the operation of waste treatment facilities/plants and/or at the minimum level provided for by appendix no. 5 to GEO no. 92/2021, including of the penalties incurred by the operators for the failure to fulfill the aforementioned obligations (**art. 6 para. (1) letter i**) of Law no. 101/2006);
- **to adopt the organizational measures required** for the implementation of the separate waste collection system, **in order to transport it to the treatment facilities (art. 6 para. (1) letter j)** of Law no. 101/2006).

According to the provisions of **art. IV para. (1)** of Law no. 99/2014, **decision-making authorities of the districts of Bucharest municipality** have exclusive powers in what concerns establishment, organization, assignment and performance of sanitation service activities, **except the activities which fall within the competence of the territorial and administrative division of Bucharest municipality**, respectively for pest control, disinfection, **organization of processing, neutralization and material and energy recovery of waste**, organization of mechano-biological treatment of municipal waste and similar waste, management of waste storage facilities and/or municipal and similar waste disposal facilities, as well as coordination, monitoring and control of sanitation service, establishing and approval of sanitation service performance indicators, after their public debate. The decision-making authorities of the districts of Bucharest shall be **bound to comply with the local strategy** on the medium and long term development of sanitation service, approved by the General Council of Bucharest.

As an exception to the provisions of para. (1), in order to avoid abandonment and illegal storage of waste, **the decision-making authorities of the districts of Bucharest can take over the powers of the territorial and administrative divisions of Bucharest** on the organization of material and energy recovery of waste (**art. IV para. (2)** of Law no. 99/2014).

The powers of the decision-making authorities of the districts of Bucharest, provided for by para. (2), shall be taken over by means of the resolution of the local council and shall be notified to the General Council of Bucharest within 15 days as of the adoption thereof (**art. IV para. (3)** of Law no. 99/2014).

The taking over of the competences according to para. (3) shall apply **on a definite term**, provided in the resolution of the local council, **without exceeding the term provided by the Waste Management Plan of Bucharest Municipality**, approved by Resolution no. 260 of the General Council of Bucharest Municipality of 01.09.2021 (**art. IV para. (4)** of Law no. 99/2014). Direct management or delegated management **can be granted for one or more of the activities provided for by art. 2 para. (3) (art. 14 para. (2)** of Law no. 101/2006).

The operators **shall be prohibited to perform activities of transfer, sorting, treatment and/or disposal by storage of municipal waste without having a delegation agreement** concluded with TAD/district of Bucharest municipality the waste originates from (**art. 2 para. (8<sup>1</sup>)** of Law no. 101/2006).

**In the case of delegated management**, the **procedure for awarding agreements of delegation** of the management of sanitation activities, **including for public procurement of services provided by means of treatment facilities/plants privately owned by economic operators**,



shall be established by the contracting authorities **according to the provisions of Law no. 98/2016 or Law no. 100/2016**, including by observing legal regime of management delegation agreements provided for by art. 29 para. (10) and (11) of Law no. 51/2006 (**art. 14 para. (3)** of Law no. 101/2006).

The territorial and administrative divisions that individually assign the activity of separate collection and separate transport of municipal waste shall be **bound to assign, in advance, the activities of sorting, waste treatment and/or disposal**, by storage, of residual waste and of residues resulting from the treatment process, as the case may be, provided that the respective activities have not been delegated, in association with other territorial and administrative divisions, by the intercommunity development association where they have the capacity of members. The operators **shall be prohibited to perform activities of sorting, treatment and/or disposal**, by storage, of municipal waste **without having a delegation agreement** concluded with the territorial and administrative unit/subdivision the waste originates from (**art. 14<sup>4</sup>** of Law no. 101/2006).

The operators performing the activity of separate collection of municipal waste shall be **bound to transport the separately collected fractions only to the operators of transfer facilities, operators of sorting facilities, operators of treatment plants and operators of waste storage facilities which have concluded delegation agreements** with the territorial and administrative divisions or, as the case may be, with the districts of Bucharest municipality the respective waste is collected from (**art. 14<sup>5</sup>** of Law no. 101/2006).

**The economic operators that own sorting facilities, waste treatment plants and/or non-hazardous waste storage facilities shall be entitled to carry out the activities of sorting, treatment or, as the case may be, disposal of municipal waste only based on the management delegation agreements** concluded with the territorial and administrative divisions/districts of Bucharest municipality the respective waste originates from or, as the case may be, with the intercommunity development associations, based on the special mandate received from the territorial and administrative units/subdivisions where they have the capacity of members (**art. 149** of Law no. 101/2006).

In what concerns the **financing of the activity**, the prices and rates for the payment of the services shall be proposed by the operators and shall be established, adjusted or modified by resolutions of the decision-making authorities of TAD or, as the case may be, of the intercommunity development associations the scope of which is the public utility services, under the terms of the special laws, in compliance with the methodologies drawn up by the competent regulatory authority (i.e. A.N.R.S.C.) (**art. 43 para. (5)** of Law no. 51/2006).

The level of the rates tendered/negotiated within the procedures for the awarding of the management delegation agreements **shall be substantiated on expenditure items**, on the basis of the substantiation sheets for setting the rates for the specific activities of the sanitation service drawn up by the operators, according to the provision of art. 137 para. (3) letter a) of GO no. 395/2016 or, as the case may be, art. 89 para. (3) letter a) of GO no. 867/2016 (**art. 26 para. (5)** of Law no. 101/2006).

The contracting authorities shall be bound to provide in the tender book that the **tendered rates must be accompanied by the substantiation sheets on expenditure items**, on the contrary, the offer being considered non-compliant, in accordance with the provisions of art. 137 para. (3) letter a) of GO no. 395/2016 or, as the case may be, art. 89 para. (3) letter a) of GO no. 867/2016 (**art. 26 para. (5)** of Law no. 101/2006).

Subsequent adjustment or modification of rates/taxes shall be performed by the local public administration authorities, upon the operator's request, in compliance with the methodological regulations issued by A.N.R.S.C. (**art. 26 para. (7)** of Law no. 101/2006).

The level of sanitation rates and taxes shall be established so that (**art. 26 para. (8)** of Law no. 101/2006):

- a) to cover the effective cost of the sanitation service provision;
- b) to cover at least the invested amounts and the current maintenance and operation expenses of the sanitation service;
- c) to encourage capital investment;
- d) to observe and to ensure the operator's financial autonomy.

### 3. FUTURE RESEARCH DIRECTIONS

Please note that in future research, we would like to analyse the Romanian regulation of operator's licensing. According to the provisions of **art. 13 para. (1) and (2) letter e)** of Law no. 51/2006 and **art. 11 para. (1)** of Law no. 101/2006, the **National Authority for Regulating Community Services on Public Utilities** is the authority competent to regulate locality sanitation service. **It issues licenses**, develops methodologies and framework regulations for the field of public utility services in its regulatory area and for the market of such services and monitors the compliance with and implementation of the legislation applicable to these services (**art. 13 para. (3)** of Law no. 51/2006).

In case of the delegated management, the operators can carry out their activity **based on the management delegation agreement and the license granted by A.N.R.S.C.** The performance of the sanitation activity/activities by operators without the license granted by A.N.R.S.C. shall represent an offence and shall be punished by a fine amounting between RON 30,000 and RON 50,000 (**art. 22 para. (2)** of Law no. 101/2006 and **art. 47 para. (4) letter c)** of Law no. 51/2006).

In what concerns **ANRSC license**, according to the provisions of **art. 6 para. (2) letter g)** of GO no. 745/2007, this shall be granted for specific activities of the public sanitation service of localities, among which "*organization of the processing, neutralization and material and energy recovery of waste*".

In what concerns **types of licenses**, according to the provisions of **art. 10** of GO no. 745/2007, licenses shall be granted in **three (3) classes**, depending on the number of inhabitants served, as follows: **class 1** – for a number **higher or equal to 300,000 inhabitants**, **class 2** – for a number **between 50,000 and 300,000 inhabitants**, and **class 3** – for a number **lower or equal to 50,000 inhabitants**.

### 4. CONCLUSION

For all these reasons, we think that just like the European legislation, Romanian national legislation ([Legislatie.just.ro](http://Legislatie.just.ro), n.d.) supports and encourages recovery operations, so that the waste is used as much as possible, including for obtaining electricity and/or thermal energy, and the quantity of municipal waste disposed in waste storage facilities is reduced as much as possible.

As underlined, one of the targets required by the NWMP, was that the quantity of stored municipal waste to be reduced to a maximum of 10%, until 2030, Romania being granted the

opportunity to benefit from an additional five-year term, provided that all measures required in order to reduce the quantity of stored municipal waste to 20% of the total quantity of generated waste are implemented until 2030. The NWMP also provides that one of the priorities of Romania in what concerns waste management and prevention is encouraging the production of energy from waste that cannot be recycled, by providing at the same time that the incineration of municipal waste with energy recovery is a very used and well-known technology.

Romania is a good example of a state that has been obliged, on the basis of the judgments of the **European Court of Human Rights (n.d.)**, to constantly adapt and align itself with European standards in matters essential to the existence of a democratic society (e.g. protection of the right to property, freedom of expression, the functioning of the judiciary, the prohibition of torture and ill-treatment, and the list goes on). The legacy of communism, which turned the most basic human rights into privileges, has often led the European Court of Human Rights to find that the Romanian authorities have violated the provisions of the Convention.

### References

- Alfredsson, G. (2001). The Right to Human Rights Education. In A. Eide, C. Krause, & A. Rosas (Eds.), *Economic, Social and Cultural Rights: A Textbook* (2nd ed., revised). The Hague: Kluwer Law International Publishing House.
- Birsan, C. (2010). *Convenția europeană a drepturilor omului: comentariu pe articole (European Convention on Human Rights: Commentary on Articles)*. Bucharest: C.H. Beck Publishing House.
- Boroi, A. (Ed.). (2016). *Dreptul penal al afacerilor (Business Criminal Law)* (6th ed., revised and supplemented). Bucharest: C.H. Beck Publishing House.
- European Court of Human Rights. (n.d.). Retrieved from [www.echr.coe.int](http://www.echr.coe.int)
- Legislatie.just.ro. (n.d.). Retrieved from <https://legislatie.just.ro/>
- Mihr, A. (2004). *Human Rights Education: Methods, Institutions, Culture and Evaluation*. Magdeburg: Institut für Politikwissenschaft Publishing House.





# Corporate Fraud and Liability Provisions in Albania

Ledja Burnazi Mitllari<sup>1</sup> 

Received: August 29, 2023

Accepted: November 10, 2023

Published: March 16, 2024

## Keywords:

Corporate fraud;  
Albania Company Law;  
Liability



Creative Commons Non Commercial CC BY-NC: This article is distributed under the terms of the Creative Commons Attribution-Non-Commercial 4.0 License (<https://creativecommons.org/licenses/by-nc/4.0/>) which permits non-commercial use, reproduction and distribution of the work without further permission.

**Abstract:** *Corporate fraud is a very problematic and serious phenomenon, regardless of company size, place of business, branches and way of doing business. Considering fraud not only as a random phenomenon of corporate reality but to a great extent as a criminal offense as provided for in almost all laws, responsible persons (those who commit such an offense) bear criminal as well as civil liability, depending on the circumstances and jurisdiction to which they belong. This paper will critically approach the concept of corporate fraud following the Albanian legal framework and jurisdiction. It will focus on the key aspects of the company in question, the civil and criminal provisions related to the liability that would be borne by the executives and/or the corporation, the fiduciary duties of the executives, the interpretation of the court cases established so far, case studies and analyzing the effectiveness of the application of the respective legal provisions.*

## 1. INTRODUCTION

Corporate fraud is a widespread and complex problem affecting firms worldwide, cutting through borders related to geography, organizational size, and operating strategies. This phenomenon entails the purposeful falsification, misrepresentation, or manipulation of financial data, assets, or transactions for individual or corporate gain. Corporate fraud threatens the integrity of financial markets, erodes public confidence, and poses serious problems for societal well-being and economic stability. This study intends to examine the complex terrain of corporate fraud in Albania while assessing the efficacy of the laws governing the civil and criminal liability imposed on corporate entities and individual executives. Corporate fraud may be considered an incidental part of business operations, but it is crucial to understand that it is a crime with serious repercussions.

The effectiveness of civil and criminal responsibility rules for executives and companies in preventing corporate fraud in Albania is examined in this article. The study stresses how crucial it is to demonstrate executive criminal culpability by demonstrating intent, knowledge, and active participation in Albania. Civil liability laws prioritize reimbursing victims and reestablishing economic equilibrium. While corporate criminal responsibility acknowledges an entity's propensity to commit crimes, vicarious culpability emphasizes organizational accountability. The laws of Albania are influenced by comparative analysis, which identifies global best practices and difficulties. Effective enforcement is still necessary. In conclusion, it is essential to combat corporate fraud, protect stakeholders, and promote transparency and integrity within Albania's corporate landscape through a strong legal reaction and proactive prevention.

The intention of this paper is not to analyze the economic effects of corporate fraud, but only the focus on liability for such offence. Fraudulent actions within the corporate activity appear in various forms and might belong to different sectors of such activity. The most common ones, however, usually refer to cases such as the misreporting of balance sheets, falsifications of the data, manipulation, and falsification in the financial statements.

<sup>1</sup> Faculty of Law and Social Sciences, University of New York, 21 Dhjetori Square, 1001 Tirana, Albania

## 1.1. Background and Significance

Numerous international financial scandals that have shaken economies and undermined public confidence have repeatedly shown the negative effects of corporate malfeasance. Globally, legislative actions have been taken by governments and legal systems to address and deter corporate fraud. To solve this urgent issue, Albania, a participant in the global economic community, has also adopted legal procedures. This paper aims to critically assess how well these regulations deal with corporate fraud and hold offenders accountable.

## 1.2. Research Objectives

The main goal of this study is to examine the legislative framework in Albania's provisions for the civil and criminal culpability of executives and corporations implicated in corporate fraud. The study's specific objectives are to:

- Assess the sufficiency and clarity of legal definitions and standards for detecting corporate fraud.
- Look into the practical application and enforcement of criminal and civil responsibility clauses.
- Examine if punitive actions, sanctions, and penalties successfully prevent corporate fraud.
- Look at the difficulties and barriers that prevent successful prosecution and damage recovery.
- Provide suggestions for prospective legislative framework enhancements based on global best practices.

## 2. LEGAL FRAMEWORK AND CORPORATE FRAUD

Corporate fraud, which frequently involves lying, misrepresenting, or manipulating financial data for unlawful gain, poses a serious threat to the honesty of business operations and the health of the economy as a whole. Corporate fraud is defined, prevented, and punished by law to resist this threat effectively (Bashari & Metani, 2021). This section explores the many dimensions of corporate fraud's legal framework, including its definition, typologies, and global context.

### 2.1. Corporate Fraud: Definition and Types

A precise and thorough definition of corporate fraud is crucial to any legal structure. Corporate fraud in Albania includes a variety of behaviors, including but not restricted to:

Financial statement fraud: falsifying financial documents to give the impression that an entity is in good financial standing.

1. Insider trading: Using secret knowledge to your benefit while trading securities.
2. Bribery and corruption: Giving or receiving improper benefits to sway business judgments.
3. Asset misappropriation: the unauthorized use of corporate resources for one's benefit.
4. Market Manipulation: Creating misleading information or transactions to manipulate market circumstances.

Effective enforcement and prosecution of these kinds of corporate fraud depend on having a sophisticated understanding of them (Desai, 2020).

## 2.2. Legal Aspects of Corporate Fraud from a Global Perspective

Corporate fraud is a global problem that transcends national boundaries, necessitating global cooperation and unified legal standards. Due to the seriousness and prevalence of corporate fraud, many governments worldwide have passed legislation to address it (Bashari & Metani, 2021). For instance, in reaction to the Enron crisis, the United States passed the Sarbanes-Oxley Act, strengthening financial reporting standards and providing whistleblower protection (Constable, 2022). Similarly, the Fraud Act of 2006 in the United Kingdom included extensive provisions to address numerous types of fraud (Correia, 2019). Studying different legal systems worldwide sheds light on effective methods for thwarting business fraud and may influence future legal reforms in Albania.

## 2.3. Corporate Fraud in the Legal Context of Albania

Corporate fraud is addressed within the Albanian legal system using a combination of statutory laws, rules, and legal precedents. Corporate fraud charges are described in the Albanian Penal Code, whereas the Albanian Civil Code's guiding principles govern civil responsibility (Veizi & Bega, 2023). Supervisory organizations, like the Financial Supervisory Authority, are also essential in regulating the financial markets and spotting fraud. However, it is crucial to evaluate these legislative measures' effectiveness, how they are enforced, and the overall deterrence they provide against corporate fraud (Nikolla et al., 2023). It is with great importance to be mentioned that a certain role plays also the Law 9753/2007 as amended "For Criminal Liability of the Juridical Persons". The effectiveness of these legal measures and how they affect preventing and dealing with corporate fraud in Albania will be covered in more detail in the next sections of this paper.

## 2.4. Criminal and Civil Liability: Executives and Entities

### 2.4.1. Criminal Liability of Executives

Corporate fraud exposes executives, who play a key role in determining the course of corporations, to criminal liability, underscoring the gravity of the situation and serving as a deterrent and a tool of justice (Bezo & Dibra, 2020).

*Criminal Liability Elements.* Several requirements must be met to prove an executive's criminal responsibility for corporate fraud. A key consideration is intent, which calls for evidence that the executive engaged in dishonest behavior to earn a personal or organizational gain. It includes proving that the executive was aware of incorrect information, misrepresentations, or other fraudulent actions, proving knowledge is equally important (Bezo & Dibra, 2020). The executive's involvement in the fraudulent scheme must also be proven, proving their involvement in organizing or aiding the scam.

*Prosecution and Sentencing.* When bringing charges against CEOs for corporate fraud, precise evidence presentation is crucial. Financial information and pertinent papers are scrutinized when a case is litigated. For CEOs who are found guilty, severe penalties, time behind bars, probation, or a mix of these are possible sentences. Penalty severity depends on various variables, including the degree of deception, financial losses, executive involvement, and prior criminal history. For successful prosecution, responsibility, justice, and deterrence of potential wrongdoers, there must be effective cooperation between the judiciary, regulatory bodies, and law enforcement (Valbona et al., 2021).

### 2.4.2. Civil Liability of Executives

In corporate fraud cases, the legal system covers executive civil accountability and criminal responsibility. Its primary goal is to repair harm and restore financial integrity by providing restitution and compensation to persons who have suffered financial hardship due to fraudulent activity.

*Compensation and Restitution.* Underscoring restoration and compensation is executive civil liability. Executives who are legally responsible might have to make restitution to organizations that suffer losses due to fraud (Venditti et al., 2020). This may also apply to stakeholders whose stock prices are inflated or investors who lose money due to inaccurate data. In order to restore the financial balance that the deception upset, restitution also entails restoring assets or income obtained illegally (Olldashi & Hoxha, 2019). If the fraudulent strategy results in financial losses for shareholders or other stakeholders, executives may be required to pay back any improper gains. This characteristic emphasizes the idea that wrongdoers should not profit unfairly at the expense of others.

*Piercing the Corporate Veil.* Additionally, "piercing the corporate veil" occasionally makes particular leaders personally accountable for corporate misdeeds. This idea ignores the legal distinction between a person and a corporation when fraudulently using the corporate structure. This guarantees that CEOs remain personally liable for dishonest behavior, regardless of corporate protection (Valbona et al., 2021). Civil liability cases require careful examination of financial records, contractual obligations, and pertinent facts to ascertain the extent of the victims' financial injury. In the wake of corporate crime, the legal system seeks to protect justice and accountability by placing civil liability on CEOs to give harmed parties opportunities to pursue restitution and correct financial imbalances.

### 2.4.3. Criminal Liability of Entities

Legal systems have developed to hold corporate entities criminally responsible for their activities because it is now understood that these companies can play a significant role in committing corporate fraud. By directing attention away from specific wrongdoers and toward the larger organization, this strategy seeks to assign collective blame to the latter. Imposing criminal culpability on companies highlights the necessity for strict compliance and moral behavior by acknowledging their capability to commit crimes.

### 2.4.4. Corporate Criminal Liability

Corporate criminal accountability increases legal liability. Companies and other legal entities can be held accountable for their actions (Nuredini & Matoshi, 2021). Preventing corporate fraud and developing workplace ethics require this perspective. Corporate criminal liability often requires showing the entity's direct involvement, collaboration, or tolerance for fraudulent activity. The organization must have known, approved, or profited from the fraud. Successful prosecutions require a thorough investigation and detailed documentation by law enforcement, regulatory, and legal specialists.

*Sanctions and Penalties.* Companies convicted of corporate fraud face various penalties. These can involve large fines, the loss of illegal gains, court-mandated compliance processes, and firm



probation. These consequences aim to hold the offender accountable, deter future fraud, and encourage strong internal controls and ethical frameworks (Çeloaliaj, 2019). Corporate criminal responsibility shifts the paradigm to emphasize organizational accountability in fighting corporate fraud (Nuredini & Matoshi, 2021). Liability encourages corporate accountability, transparency, and ethics. The next section will evaluate Albanian law provisions using real-world case studies and comparative analyses.

#### 2.4.5. Civil Liability of Entities

Corporate fraudsters face civil and criminal liability. Civil culpability compensates victims for financial losses and restores corporate fraud's equilibrium. This section discusses corporate civil liability in detail, focusing on accountability, restitution, and compensation.

*Vicarious Liability.* The vicarious responsibility principle holds companies liable for their workers' or agents' actions. This ensures that companies cannot avoid responsibility by blaming others (Krasniqi, 2020). The entity may be liable if its representatives or employees deceive others for their gain (Krasniqi, 2020). Because they control their staff, companies should be held accountable for fraud. This rule prohibits businesses from tolerating or supporting such behavior and emphasizes the need for competent supervision.

*Damages and Fines.* Civil penalties for corporate fraud may include large fines and damages to victims. Fines punish offenders while damages restore victims' finances. To calculate fines and damages, stakeholders, investors, and other impacted parties must analyze their financial losses (Cela et al., 2023). Courts weigh the fraud's gravity, financial damage, and the entity's role in preparing or sanctioning it. Organizations have a civil obligation, and victims can seek restitution under the law to increase accountability (Cela et al., 2023). This legal reaction restores financial fairness, promotes moral company behavior, and deters corporate dishonesty.

### 3. CASE STUDIES AND COMPARATIVE ANALYSIS

#### 3.1. High-Profile Corporate Fraud Cases in Albania

Albania has had several high-profile corporate fraud cases, which have prompted questions about transparency, accountability, and governance in the country's corporate environment. The incident involving the former first lady, Monika Kryemadhi, stands out among these examples. Monika Kryemadhi has been linked to a controversy involving payments from Kremlin-affiliated Russian oil businessmen (Digest, 2023). Around the time of Albania's 2017 presidential and parliamentary elections, the payments were made. Kryemadhi is charged with denying all wrongdoing while attempting to discredit the magazine that revealed the payments. This case emphasizes the expanding Russian influence in the Western Balkans and the necessity for Albania to deal with corruption and negative influence as it pursues EU membership.

Another incident regarding the construction and operation of garbage incinerators in Albania led to eleven people's arrest. Concessions were given to a business with no prior trash management background, resulting in the improper use of millions of taxpayer dollars (Taylor, 2022). Even when the incinerators were not working, the corporation got paid. A Socialist Party minister and other former government officials have been charged with corruption and bribery concerning the affair. Despite requests for a full inquiry, the government nonetheless pays the concessions.

The case study of the fraudulent scandal of CEZ-DIA is considered the main case of this size regarding corporate fraud in the corporate world of Albania (Burnazi, 2016). The head of the board of directors of the CEZ group's subsidiary in Albania, Josef Hejsek, together with Kastriot Ismailaj, an Albanian businessman were the key players in the fraudulent scheme of a debt collection that cost millions of euros. Everything started in 2009 when CEZ group bought a controlling stake in the company of electricity distribution in Albania Operator of the distribution system (OSSH) and rebranded the company with the commercial name CEZ Shperndarje. The biggest problem that faced this company was the large amount of debt that Albanian citizens had because of not paying their electricity bills for a long time. In order to collect all the arrears debt of the OSSH, the CEZ subsidiary in Albania (hereafter CEZ Shperndarje) contracted a private company (Burnazi, 2016). Also, DIA was one of the fictive companies established by Ismailaj for fraudulent purposes. It has resulted that this company was founded on July 5, 2010, with a principal capital of 50000\$, with headquarters in "Trident Chambers, Virgin Islands" and its CEO was J. M. who decided on August 2, 2010, to open a subsidiary in Tirana, Albania, employing as the legal representative of the company Kastriot Ismailaj. It is registered in the National Business Center, and its activity consists of financial investments, collecting obligations, consulting, commercial activity, export-import of goods, etc. Regarding the legal framework, this subsidy was acting regularly and in harmony with the Albanian laws. The only handicap of all this is that it is verified by the prosecution that Ismailaj has presented fake data and information regarding the organizational structure of the company and its experience in the required field. The prosecution accused Ismailaj of the criminal offense of Fraud with serious damages, money laundering and laundering of criminal products. Also, the prosecution in 2015 ordered the confiscation of the amount of 3.4 million dollars, which is suspected of coming from the illegal activity of Ismailaj. This order was issued by the Prosecution of Serious Crimes on the framework of the Anti-Mafia law, after the investigations performed by the Prosecution of Tirana. This amount of money was alienated by Ismailaj through some suspicious transactions with one fictive company in Switzerland and with one another in the U.S.

The case of CEZ- DIA went through an arbitration process in the Vienna International Arbitral Center (VIAC), where the CEZ group initiated these procedures against Albania for the damage caused. However, under the pressure of the Czech Republic over its EU integration bid, the dispute remained resolved in Tirana, and Albania paid 95 million Euros for shares to the company. The most interesting fact is that Ismailaj when used to sign the contract with CEZ Shperndarje was under investigation for money laundering, a fact that the supervisory board of the CEZ Shperndarje did not take into consideration, or did not investigate for the Ismailaj figure and criminal records, and this might be considered as negligence for this board (Likmetaj & Veizaj, 2015).

Additionally, Albania went through a serious Ponzi scheme problem in the 1990s, when shady businesses enticed a sizable section of the populace to invest by promising enormous returns. When these plans fell apart, there was severe civil unrest and other issues (Staff, 2018). The incident emphasizes the value of good company ethics and governance in averting similar financial catastrophes. The success of the Ponzi schemes was made possible by a lack of control and governance, highlighting the demand for significant legislative changes to safeguard investors.

### **3.2. Comparative Analysis: Legal Provisions' Efficacy**

It is clear from a comparison of the prominent corporate fraud cases in Albania that the nation's legal framework could require improvement to deal with such instances successfully. The issues concerning Monika Kryemadhi and the concessions for the incinerator draw attention to potential

weaknesses in the existing legal systems. The accusations against Kryemadhi highlight the difficulties in implementing financial accountability and transparency, particularly in situations involving foreign interests, like the suspected ties to Russia. The incinerator issue also highlights the need for improved rules and control when issuing contracts and handling public funds.

### 3.3. Challenges and Enforcement Gaps

The prominent corporate fraud instances mentioned above highlight substantial difficulties and enforcement limitations in the Albanian setting. The Monika Kryemadhi affair shows how intimidation strategies, like Strategic Lawsuits Against Public Participation (SLAPPs), intimidate the media and obstruct investigations (Digest, 2023). This approach hinders efforts to tackle corruption effectively and impedes accountability. Due to lax government monitoring, corruption, and improper fund distribution occurred in the incinerator affair, raising issues with contract enforcement and project management. Even more, the Ponzi scheme crisis highlights how vitally important strong company ethics and governance are for preventing financial catastrophes and safeguarding investors (Staff, 2018). To maintain transparency, accountability, and the rule of law in Albania's corporate sector, these difficulties highlight the significance of thorough legal reforms and improved enforcement measures.

## 4. FUTURE RESEARCH DIRECTIONS

Although this study offers insightful information about the efficiency of Albania's legal guidelines and enforcement practices regarding corporate fraud, several directions for future research could further advance our comprehension of this complicated problem. A comparative examination of corporate fraud cases involving several Balkan nations can be explored, providing a more comprehensive evaluation of regional trends and variances in enforcement outcomes. Additionally, research into how technological innovations like blockchain and digital forensics might be used to prevent and identify corporate crime may provide essential insights into future difficulties and possible solutions. A more thorough understanding of the underlying reasons for fraudulent actions would also result from exploring the psychological and socio-economic elements that influence corporate fraud and the impact of cultural norms and ethical issues. Furthermore, long-term research examining the effects of regulatory changes on corporate fraud rates over time would support efforts to improve corporate governance and financial integrity in Albania and elsewhere.

## 5. CONCLUSION

Corporate fraud continues to be a threat to economies and enterprises around the world. The effectiveness of civil and criminal liability laws in Albania for CEOs and entities was investigated in this study. The importance of demonstrating intent, knowledge, and participation was underlined when criminal responsibility was examined, highlighting the importance of cooperation between law enforcement and regulatory organizations. Mechanisms for civil culpability highlighted compensation and restoring the financial balance that fraud had upset. While corporate criminal culpability recognized an entity's power to conduct crimes, vicarious liability strengthened organizational accountability. Comparative studies that highlighted global best practices and problems influenced Albania's legal provisions. Enforcement that works well is still essential. Detering corporate fraud, providing shareholder protection, and promoting transparency and integrity in Albania's business sector depends on a strong legal reaction and proactive prevention.

## References

- Bashari, E., & Metani, A. (2021). Corporate liability within the legal framework in Albania-A comparative perspective with international and EU standards. *Balkan Journal of Interdisciplinary Research*, 7(2), 7.
- Bezo, Y., & Dibra, R. (2020). Corporate governance, analyses, and theories: The case of Albania. *Academy of Strategic Management Journal*, 19(1), 1-14.
- Burnazi, L. (2016). The Effectiveness of the Respective Provisions for Civil and Criminal Liability of Executives and Entities; An Overview of the Legal Framework of Albania, United States of America and Germany. Master Thesis Dissertation, University of New York, Tirana. <https://unyt.edu.al/>
- Cela, E., Çela, R., & Kalemaj, E. (2023). Liability for Causing Damage under European Private International Law: Albanian Rapprochement Framework during the Integration Process Towards the EU. *Interdisciplinary Journal of Research and Development*, 10(1 S1), 89-89.
- Çeloalaj, M. (2019). GENERAL REGULATION ON PERSONAL DATA PROTECTION. CERTAIN ASPECTS OF THE GDPR'S IMPACT ON LEGAL ENTITIES IN THE REPUBLIC OF ALBANIA. *KNOWLEDGE-International Journal*, 34(5), 1487-1490.
- Constable, S. (2022). TWO DECADES OF THE Sarbanes-Oxley Laws. *Financial History*, (142), pp. 16–19.
- Correia, S. G. (2019). Responding to victimization in a digital world: a case study of fraud and computer misuse reported in Wales. *Crime Science*, 8(1), 1-12.
- Desai, N. (2020). Understanding the theoretical underpinnings of corporate fraud. *Vikalpa*, 45(1), 25-31.
- Digest, I. P. (2023, March 23). *The Many Scandals of Albania's Former First Lady*. International Policy Digest. <https://intpolicydigest.org/the-many-scandals-of-albania-s-former-first-lady/>
- Krasniqi, F. (2020). Criminal Liability of Legal Entity: The Case of Kosovo and Albania. *Journal of International Trade, Logistics, and Law*, 6(2), 13–18.
- Likmetaj, B., & Veizaj, F. (2015). "Fraudulent Debt Collection Schemes Cost Albania millions", Birn, Tirana.
- Nikolla, K., Xhebraj, A., & Hoxha, L. (2023). DEVELOPMENT OF E-COMMERCE AND E-GOVERNANCE IN ALBANIA. In *5th EASTERN EUROPEAN CONFERENCE OF MANAGEMENT AND ECONOMICS (EECME 2023)* (p. 40).
- Nuredini, B., & Matoshi, R. (2021). Legal Regulation of the Limited Liability Company in North Macedonia, Albania, and Kosovo. *Balkan Social Science Review*, 18, 183-205.
- Olldashi, E., & Hoxha, R. (2019). Albanian Legislation on Restitution of Property Confiscated During the Communist Regime: Its Structural Inconsistencies and a Negative Social Perspective for Achieving an Effective Domestic Remedy. *European Journal of Social Sciences*, 2(2), 110-119.
- Staff, C. (2018, January 30). *Albanian Ponzi Schemes as an Extreme Case for Strong Corporate Governance*. Anti-Corruption & Governance Center. <https://acgc.cipe.org/business-of-integrity-blog/albanian-ponzi-schemes-as-an-extreme-case-for-strong-corporate-governance/>
- Taylor, A. (2022, November 18). *Eleven arrested in multi-million euro Albanian incinerator scandal*. <https://www.euractiv.com/section/politics/news/eleven-arrested-in-multi-million-euro-albanian-incinerator-scandal/>
- Valbona, D., Gabriella, B. M., & Mara, D. B. (2021). Corporate Social Responsibility in Albania: CSR Process Implementation in Albania: Top-Down or Bottom-Up Approach? *Current Global Practices of Corporate Social Responsibility: In the Era of Sustainable Development Goals*, 3-19.

- Veizi, Z., & Bega, R. (2023, August). CHALLENGES OF THE DEVELOPMENT OF THE FINANCIAL SYSTEM IN ALBANIA. In *International Conference on Modern and Advanced Research* (pp. 172-177).
- Venditti, C., Veshi, D., & Koka, E. (2020). The Transformation of Right to Property in the Post-Communist Period in Albania. The Impact of the Italian Civil Code in the Ways of Acquisition of Ownership in the Albanian Civil Code of 1994. *Osservatorio del diritto civile e commerciale*, 9(1), 329-352.

### Additional reading

- Bachner, Th., Schuster, E-P., & Winner, M. (February 2009). *The New Albanian Company Law: Interpreted according to its Sources in European Law*. CARDS 2004 winning project. Enhancing the Juridical System in Commercial Matters.
- Civil Code of Albania, as amended.
- Constitution of Albania, as amended.
- Criminal Code of Albania, as amended.
- Decision no.38, of the Constitutional Court of Albania, date 25.07.2013
- Decision of the Constitutional Court of Albania No.73, date 04.04.2014
- Decision of the Court of Appeals of Tirana, No 1817, date 11.11.2008
- Decision of the Supreme Court of Albania Nr.00-2013-1739 (338), date 30.05.2013
- Gorezi, A. (2011). “Shareholders rights, executive compensation and stakeholders protection: A comparative overview of United States of America and chosen EU jurisdiction”, CEU eTD Collection.
- Holland, T. B., Boci(Olldashi), E., & Ruci, H. (2013). Introductory Notes 2<sup>nd</sup> Edition, “Commentary on Albanian Company Law”.
- Kraakman, R., Armour, J., Davies, P., Eriques, H., Hansmann, H., Hertig, G., Hopt, K., Kanda, H., & Rock, E. (2003). *The Anatomy of Corporate Law*, Second Edition. Oxford University Press.
- Law No. 9754, dated 14.06.2007 “On Criminal Liability of Legal Persons” in the Republic of Albania as amended.
- Law No. 9901, dated 14.4.2008 “On Entrepreneurs and Commercial Companies” the Republic of Albania, as amended.
- Malltezi, A. (2011). *E drejta Shqiptare e Shoqerive Tregtare*. Shtypshkronja Mediaprint. ISBN: 978-99956-93-41-1





# Role of Courts in Whistleblowers Protection in the Czech Republic

Aleš Pachmann<sup>1</sup> 

Received: 30 August 2023

Revised: December 24, 2023

Accepted: December 29, 2023

Published: March 16, 2024

## Keywords:

Whistleblower;  
Courts;  
Protection



Creative Commons Non Commercial CC BY-NC: This article is distributed under the terms of the Creative Commons Attribution-Non-Commercial 4.0 License (<https://creativecommons.org/licenses/by-nc/4.0/>) which permits non-commercial use, reproduction and distribution of the work without further permission.

**Abstract:** *DIRECTIVE (EU) 2019/1937 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 23 October 2019 on the protection of persons who report breaches of the Union was implemented in the Czech Republic by the law no. 171/2023 Coll. effective from 1st August 2023. So far there is a modest related court practice concerning the abovementioned Directive from the Czech Republic. The aim of this paper is to evaluate and analyse existing court decisions in this way. The author of this paper as a whistleblower managed to initiate these proceedings as a plaintiff and he is not aware of similar proceedings in this way in the Czech Republic until now. Even delays in proceedings were qualified as retaliatory measures.*

## 1. INTRODUCTION

The last decade has been marked not only by the biggest financial crisis we have witnessed since the Wall Street Crash in 1929 but also by notorious whistleblowing acts conducted against governments, security services, sporting and doping agencies (UEFA, the Olympics Committee), and major financial institutions (eg, UBS, HSBC, SwissLeaks, LuxLeaks, the Panama Papers, and EULUX Leaks). We have also witnessed whistleblowers facing real professional and personal risks, including retribution, reprisals, intimidation and criminalisation, whereby their lives and careers have been irreparably damaged as a direct result of retaliation against whistleblowers (Turksen, 2018).

Law-breaking activities within firms are widespread but difficult to uncover, making whistleblowing by employees desirable (Butler et al., 2020).

DIRECTIVE (EU) 2019/1937 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 23 October 2019 on the protection of persons who report breaches of Union law (Directive (EU) 2019/1937) defines whistleblower as persons working in the private or public sector who acquired information on breaches in a work-related context or persons in a work-based relationship which has since ended or persons whose work-based relationship is yet to begin in cases where information on breaches has been acquired during the recruitment process or other pre-contractual negotiations. Besides other things definition of whistleblower is fulfilled while reporting breaches against EU financial interests.

The new Directive will require Member States to create rules for organizations with more than 50 workers, will mandate such organizations to implement whistleblowing hotlines for reporting a broad range of EU law violations, and will contain minimum standards on how to respond to and handle any concerns raised by whistleblowers (De Zwart, 2020).

<sup>1</sup> AMBIS Vysoká škola, Praha Lindnerova 575/1 180 00 Praha 8 - Libeň, Czech Republic

Retaliation against whistleblowers is defined by the mentioned Directive in the following forms (given in a demonstrative way):

- a) suspension, lay-off, dismissal or equivalent measures;
- b) demotion or withholding of promotion;
- c) transfer of duties, change of location of place of work, reduction in wages, change in working hours;
- d) withholding of training;
- e) a negative performance assessment or employment reference;
- f) imposition or administering of any disciplinary measure, reprimand or other penalty, including a financial penalty;
- g) coercion, intimidation, harassment, or ostracism;
- h) discrimination, disadvantageous or unfair treatment;
- i) failure to convert a temporary employment contract into a permanent one, where the worker had legitimate expectations that he or she would be offered permanent employment;
- j) failure to renew, or early termination of, a temporary employment contract;
- k) harm, including to the person's reputation, particularly in social media, or financial loss, including loss of business and loss of income;
- l) blacklisting on the basis of a sector or industry-wide informal or formal agreement, which may entail that the person will not, in the future, find employment in the sector or industry;
- m) early termination or cancellation of a contract for goods or services; (n) cancellation of a licence or permit;
- n) psychiatric or medical referrals (Directive (EU) 2019/1937).

Although whistleblowing serves the public interest, too often the individuals behind these disclosures are delegitimized and experience harassment and retaliation (Abazi, 2020).

## 2. DELAYS IN PROCEEDINGS AS RETALIATION AGAINST WHISTLEBLOWERS

The author of this paper as a whistleblower and a plaintiff against one ministry managed to take part in the Czech Republic court decision No. 12 C 211/2021-168 from 1. July 2023:

*“The plaintiff initially demanded payment of the sum of CZK 280,899 from the defendant with accessories in the form of default interest in the amount of 10% per annum from 15/12/2019 and the costs of proceedings claiming that it is non-pecuniary damage that should have resulted from the disproportionately long proceedings conducted by the defendant about his request for payment of compensation for his participation in the mission of national experts in the amount of CZK 280,899, when the defendant, following the decision of the District Court for Prague 7 in case 4 C 27/2019 first decided only on 22/03/2021 and subsequently on the appeal on 8/07/2021, thereby deliberately prolonging the proceedings, whereas against the last decision he filed an administrative action led by the Municipal Court in Prague under sp. stamp 14 Ad 17/2021...*

*The plaintiff subsequently added that the proceedings were burdened by delays in the proceedings before the administrative court (sp 14 Ad 17/2021) and overall, reaching 4 years, is disproportionately long. By filing dated 22/05/2023 then extended the claim for the payment of the amount of CZK 15,437 with default interest of 15% per annum on this amount from 1/6/2023 until payment. He justified the extension of the lawsuit by the fact that this (compensation) proceeding is also disproportionately long while pointing to ECtHR*



*jurisprudence, according to which compensation proceedings can be carried out an eligible remedy unless it is itself unreasonably long, and if it is, it is the reason for increasing the compensation. He added that the proceedings were started on 19/10/2021, lasted a year and 7 months and it's not over yet. At the same time, he pointed to the jurisprudence of the ECtHR in the case of Žirovnický vs. the Czech Republic according to which proceedings in one level of the judicial system should not exceed 1 year and 6 months and in two degrees then 2 years. The procedure is not complicated in terms of legal or procedural aspects. He pointed out that delays arising from repeated decision-making, after the annulment of the first-instance decision by the appeals court, must be added to the burden of the courts. Regarding the amount of damages for unreasonable length of time (compensation proceedings) came out of the basic amount of CZK 15,000 for the first two years of management, which he increased by 10%. With regard to the importance of the subject of the proceedings for the plaintiff, as the amount sued is high) and by another 20% for the reason of the slow progress of the court. In conclusion, he added that there should have been delays in the evidence at every stage of the process.....In proceedings before the administrative body then failed to comply with the deadlines for issuing a decision, and thus were unjustified delays of 9 months. The previous proceedings were also burdened by unjustified delays of 14 months in administrative court. He pointed out that the mere finding of a violation of the law is not a sufficient means of correction. He pointed to the higher importance of the case for the plaintiff, saying that it was about labor law remuneration...*

*It was undisputed between the participants (§ 120 para. 3 o. s. ř.), the plaintiff filed a criminal complaint for misuse of European Union funds in 2018, which he subsequently expanded in April 2019 to include a criminal complaint for sabotage of migration quotas and also filed a criminal complaint against his leader...*

*The court assessed the proceedings as a whole from the beginning - by filing a lawsuit at the District Court for Prague 7 on 29/05/2019, with the fact that as of 01/06/2023 (announcement of the decision on this matter), it has not yet been completed and the total duration of the proceedings thus (so far) amounts to 4 years and 2 days...*

*This basic amount was subsequently increased by the court, taking into account the procedure of the state authorities for the reasons above for the specified delays (+10%). He increased the basic amount further (+5%) **considering that delays in administrative proceedings must be presumed to be prohibited retaliatory measures in the sense of Article 21, paragraph 5 directive of the European Parliament and the Council (EU) of 23 October 2019 on the protection of whistleblowers reporting breach of Union law PE/78/2019/REV1/1. Here the court adds that it was undisputed between the parties, that the plaintiff filed a criminal complaint for misuse of European Union funds in 2018 in connection with the payment of expenses, which he claimed in the considered proceedings. Defendant to court summons did not offer any other justification for the delays in the administrative proceedings (see the minutes of the meeting on 6/1/2023 page 2)...***

Czech Court pointed to Article 21, paragraph 5 of the mentioned EU Directive:

*“In proceedings before a court or other authority relating to a detriment suffered by the reporting person, and subject to that person establishing that he or she reported or made a public disclosure and suffered a detriment, **it shall be presumed that the detriment was***

*made in retaliation for the report or the public disclosure. In such cases, it shall be for the person who has taken the detrimental measure to prove that that measure was based on duly justified grounds (Directive (EU) 2019/1937)."*

According to the authors' opinion, this mentioned presumption is so-called *prima facie* proof which is different from the reversal of the burden of proof which is typical for anti-discriminatory law. However, this author's opinion is questionable as mentioned in the following text of this paper.

### **3. THE PROBLEM WITH THE TEMPORAL AND SUBSTANTIVE SCOPE OF THE MENTIONED EU DIRECTIVE IN WHISTLEBLOWER PROTECTION**

The author of this paper as a ("alleged") whistleblower and a plaintiff against one ministry managed to take part in the Czech Republic court decisions about his lay-off from public service. These decisions happened in the time before the Court decision described in chapter 2 of this paper.

*"... According to the city court, the dismissal from employment corresponded mainly to the fact that the complainant did not start his new job even three working weeks after his transfer, although he was invited to do so..."*

*... The Supreme Administrative Court dismissed the subsequent cassation complaint as unfounded and decided to reimburse the costs of the proceedings. In the justification, he particularly emphasized that the municipal court could not deal with a large part of the applicant's argumentation against the decisions of the administrative authorities at all, taking into account the **concentration of proceedings limiting the space to define the points of action, which can be expanded and supplemented only within the period for filing the action itself**. Only from this point of view could the Supreme Administrative Court assess the correctness of the municipal court's decision, because even in cassation appeal proceedings it is not permissible to apply new reasons or facts. According to the Supreme Administrative Court, for example, the complainant's objection that the city court did not deal with the violation of the principle of prohibition of double punishment and the impediment of *res judicata* was inadmissible, namely that the complainant was punished twice for the same act, when he was not paid for his absence from work and at the same time for this reason, the employment relationship was also terminated.... (RESOLUTION of the Constitutional Court No. IV. ÚS 2401/22 from 4. October 2022).*

*... According to the Supreme Administrative Court, the complainant was also not even hinted at being penalized for reporting a violation of legal regulations at the workplace, while the credibility of this alleged connection is not enhanced by the fact that the circumstances of the illegal conduct that should have occurred at his workplace were changed by the complainant during the proceedings before the administrative courts ..." (RESOLUTION of the Constitutional Court No. IV. ÚS 2401/22 from 4. October 2022).*

*... Regarding the complainant's objection regarding the violation of the right to a fair trial (sc. to judicial protection) by the fact that the burden of proof was not reversed in his case, the Constitutional Court states, in particular in accordance with the decision of the Supreme Administrative Court, that even in its opinion the case under consideration does not involve a situation in which the complainant would be in the position of*

*a person reporting a violation of rights at the workplace, therefore the Directive of the European Parliament and the Council (EU) 2019/1937 on the protection of persons reporting a violation of Union law, or Regulation No. 145/2015 Coll. , when neither the said directive nor this regulation was applied in his case at all....” (RESOLUTION of the Constitutional Court No. IV. ÚS 2401/22 from 4. October 2022).*

The Constitutional Court reached a different conclusion than the Court in the case described in the second chapter of this article. I.e. The Constitutional Court (based on previous decisions of administrative courts) did not in principle recognize the plaintiff as a whistleblower. In the opinion of the author of this article, this consideration of the Constitutional Court is questionable, but while maintaining objectivity, the author must state that this opinion apparently has its objective reasons and, in the opinion of the author, it is an issue of the temporal validity of the mentioned EU directive on the protection of whistleblowers. Explained will be later in this paper.

The previous decision to this mentioned case was done by the judgment of the Supreme Administrative Court of June 28, 2022 No. 4 Ads 440/2021-105 **which was probably the first court trial where is mentioned Directive in the Czech Republic:**

*“... The Supreme Administrative Court states that it fully respects the necessity of protecting whistleblowers of illegal behavior according to the Directive of the European Parliament and the Council (EU) 2019/1937 of 23 October 2019 on the protection of persons who report violations of Union law. However, in the case under consideration, it does not appear from the file that the complainant was penalized for the notification regarding legal violations regulations (after all, the complainant also changed the alleged cause of his penalty: while in the proceedings before the city court, he argued the wrongdoing regarding the payment of compensation to the posted persons to the Union authorities, in the cassation complaint proceedings, claims the notification of malpractices regarding implementation of relocation measures, thereby discrediting his argument himself). Substantially is that the complainant's actually found disciplinary offense could practically not have had a different result, than his dismissal from employment. Therefore, the Supreme Administrative Court considers that the defendant proved that the measure (here dismissal from employment) is based on properly justified objective facts in the sense of Article 21 paragraph 5 of the cited directive...” (RESOLUTION of the Supreme Administrative Court No. 4 Ads 440/2021 – 105).*

Supreme Administrative Court simply claimed that *prima facie* proof about retaliation against whistleblower was refuted. However, according to the author of this paper the question if courts took reality into account *prima facie* proof and also potentially reversal of the burden of proof. Directive writes:

*(93) Retaliation is likely to be presented as being justified on grounds other than the reporting and it can be very difficult for reporting persons to prove the link between the reporting and the retaliation, whilst the perpetrators of retaliation may have greater power and resources to document the action taken and the reasoning. Therefore, once the reporting person demonstrates **prima facie** that he or she reported breaches or made a public disclosure in accordance with this Directive and suffered a detriment, **the burden of proof should shift to the person who took the detrimental action**, who should then be required to demonstrate that the action taken was not linked in any way to the reporting or the public disclosure (Directive (EU) 2019/1937).*

According to the author, this Directive statement should be subjected to further clarification. In the first instance, the abovementioned dispute was resolved by the judgment of the Municipal Court in Prague No. 10 Ad 10/2020 – 102 **from 25 November 2021 (RESOLUTION of the Municipal Court in Prague No. 10 Ad 10/2020 – 102).**

**According to the author's opinion, he was not protected by the Directive on 25 November 2023 since the Czech Republic's obligation to implement this materia into national law was given to the 17. December 2023.** After such date can whistleblowers enjoy protection by Direction in the Czech Republic. It means procedural protection, even if their whistleblowing notification took place before this date. **The Directive is not even mentioned in this Court resolution.**

**In the author's opinion Municipal Court in Prague in case No. 10 Ad 10/2020 – 102 did not shift the burden of proof. New Directive could not be used and it is a question of how it is meant in the given directive with the question of reversal of the burden of proof, which in theory is something different from prima facie evidence.**

However, a possible question is whether the Court of Cassation and the Constitutional Court correctly evaluated all the requirements of the directive and, if not, whether and what practical significance this could have.

#### **4. FUTURE RESEARCH DIRECTIONS**

A deep analysis of the following Directive statement is needed:

*(93) Retaliation is likely to be presented as being justified on grounds other than the reporting and it can be very difficult for reporting persons to prove the link between the reporting and the retaliation, whilst the perpetrators of retaliation may have greater power and resources to document the action taken and the reasoning. Therefore, once the reporting person demonstrates **prima facie** that he or she reported breaches or made a public disclosure in accordance with this Directive and suffered a detriment, **the burden of proof should shift to the person who took the detrimental action**, who should then be required to demonstrate that the action taken was not linked in any way to the reporting or the public disclosure (Directive (EU) 2019/1937).*

#### **5. CONCLUSION**

Based on the knowledge gained from the available EU legislation on whistleblower protection and mentioned court case studies, it can be concluded that more court cases are needed in this way to spread debates about the real meaning of some of the provisions of the given Directive and how they can help whistleblowers in the case of legal disputes in practice. Especially the question of *prima facie* proof and shifting burden of proof. The question is if shifting burden of proof is meant in general (as in EU anti-discriminatory legislation) or just only in relation to *prima facie* proof.

#### **Acknowledgment**

This research was supported by the internal grant by AMBIS Vysoká škola, Praha Lindnerova 575/1 180 00 Praha 8 - Libeň, Czech Republic.

## References

- Abazi, V. (2020). The European Union Whistleblower Directive: A 'Game Changer' for Whistleblowing Protection? *Industrial Law Journal*, 49(4), 640-656. <https://doi.org/10.1093/indlaw/dwaa023>
- Butler, J. V., Serra, D., & Spagnolo, G. (2020). Motivating Whistleblowers. *Management Science*, 66(2), 605-621. <https://doi.org/10.1287/mnsc.2018.3240>
- De Zwart, A. P. (2020). EU whistleblowing rules to change in favor of whistleblowers. *Journal of Investment Compliance*, 21(1), 55-61. <https://doi.org/10.1108/joic-08-2020-0015>
- Directive (EU) 2019/1937 of the European Parliament and of the Council of 23 October 2019 on the Protection of Persons Who Report Breaches of Union Law.
- RESOLUTION of the Municipal Court in Prague No. 10 Ad 10/2020 – 102 from 25.11.2021. <https://www.zakonyprolidi.cz/judikat/msph/10-ad-10-2020-102>
- RESOLUTION of the Constitutional Court No. IV. ÚS 2401/22 from 4. October 2022. <http://kraken.slv.cz/IV.US2401/22>
- RESOLUTION of the Supreme Administrative Court No. 4 Ads 440/2021 – 105 from 28.6.2022. <https://www.zakonyprolidi.cz/judikat/nsscr/4-ads-440-2021-105>
- Turksen, U. (2018). The Criminalisation and Protection of Whistleblowers in the EU's Counter-Financial Crime Framework. In K. Ligeti, & S. Tosza (Eds.), *White Collar Crime - A Comparative Perspective* (1 ed., pp. 331-366). Hart Publishing.





# The Methods of Hard Power and Soft Power in International Law

Azam Korbayram<sup>1</sup>   
Elif Hoca<sup>2</sup> 

Received: August 3, 2023  
Accepted: November 10, 2023  
Published: March 16, 2024

## Keywords:

United Nations;  
Collective security;  
Intervention



Creative Commons Non-Commercial CC BY-NC: This article is distributed under the terms of the Creative Commons Attribution-Non-Commercial 4.0 License (<https://creativecommons.org/licenses/by-nc/4.0/>) which permits non-commercial use, reproduction and distribution of the work without further permission.

**Abstract:** *After the catastrophic and devastating consequences of World War II, which shook the whole world, the UN was established, one of the main goals of which was to establish the legal framework of the basic principles for the use of military force and military intervention. Namely, for the preservation of collective security, the Charter of the organization itself and numerous conventions strictly prohibit war and the use of force between the subjects of international law. In that context, various steps have been taken and binding prohibitions on the use of force have been introduced. The motive of the research consists of the introduced mechanisms for the preservation of collective security. Namely, the paper tries to analyze the legal framework of the concepts of military power and soft power. The paper tries to investigate (the differences between) the concepts of power, conflict, military power and soft power with their methods and mechanisms provided by international law.*

## 1. INTRODUCTION

In order to ensure peace, which is the basis of the entire order, the regulations of international law regarding the use of military force or violence are very important. The moment of the military in the historical development of the subject is important. In order to prevent casualties during the war and to prevent the unstable situation that may occur, a legal basis was needed for the existence of diplomatic and resolving methods in a peaceful way based on the law, instead of the use of force (Gligorova et al., 2020, pp. 9-28). Today in international law, the use of force or the threat of force to resolve disputes is prohibited (Frckoski et al., 2012, pp. 575-576). After the conclusion of the Versailles Peace Treaty, it was noted that there was no legal basis and framework in relation to the legal norm at the level of international law, which prohibits the use of force in the sense of ensuring peace, that is, resolving disputes (Acer & Kaya, 2011, pp. 89-90). In addition to the League of Nations agreement, the Simpson Doctrine and the Briand-Kellogg Agreement are some other documents that can be given as historical examples regarding the prohibition of the use of force and which allow important steps to be taken (Evans, 2010, pp. 134-136).

The UN, which was established after World War II, adopted important principles for the use of military force, that is, the use of force in the international community. The term "threat of force or use of force" used in the founding treaty defines the use of force in international law. The definition of this term in the context of international relations is discussed in Article 2 (4) of the Statute (Charter) of the UN, the Prohibition of Aggression, the Declaration on Friendly Relations between States (*General Assembly Resolution No. 2625*), and the Declaration on the Non-Use of force (*General Assembly Resolution No. 4222*).

<sup>1</sup> International Vision University, Str. Major C. Filiposki No.1, Gostivar – North Macedonia

<sup>2</sup> International Vision University, Str. Major C. Filiposki No.1, Gostivar – North Macedonia

The effort to create a barrier in the international arena for the use of force was placed on a legal basis by international conventions, and in case of conflicts, peaceful solutions were offered as a mechanism against the use of force. In that context, various international law steps have been taken and binding prohibitions on the use of force have been introduced.

## 2. METHODOLOGY

Relevant scientific literature was searched in scientific books, scientific papers in printed versions and on the online databases Google Scholar, Researchgate and Dergipark (journals of EBSCO, SCOPUS, WEB OF SCIENCE indexed) by keywords: "hard and soft power", "intervention in international law" and "collective security". The following elimination criteria were used in the selection of publications: (a) papers written in English, Turkish and other languages, (b) papers published only in the period from 2008 to 2023, and (c) papers examining the use of force in international law and military humanitarian law. In addition to meeting the elimination criteria, over 30 scientific papers were retrieved from the aforementioned online databases. All these books and scientific works are in different languages, for example; in English, Macedonian, Turkish, etc. In that way, the references and the quality of this scientific research are enriched.

## 3. THEORETICAL FRAMEWORK

**(A) Hard power (intervention, self-defense)** - the concept of power and its use, especially when dealing with interstate relations, is seen to include various mechanisms, the most important being the use of military force (aggression), the act of revenge, reciprocity, intervention and self-defense. From that point of view, keeping in mind our thematic framework, we will briefly dwell on the conceptual explanations of intervention and self-defense.

Although there are different definitions of the term hard power, one of the more important thoughts is the explanation that hard power represents the ability to coerce and grow out of a country's military and economic might. Soft power arises from the attractiveness of a country's culture, political ideals, and policies (Ilgen, 2016, pp. 26-27).

The draft declaration on the rights and duties of states in General Assembly resolution 375 adopted in 1949 (<https://documents-dds-ny.un.org/doc/resolution/gen/nr0/051/94/pdf/nr005194.pdf?>) and the "declaration on the inadmissibility of intervention in internal affairs" of the general assembly adopted in 1965 and no. 2131 "*states and the protection of their independence and sovereignty*" are other documents that support non-interference in the internal affairs of states and explain the issue (<https://documents-dds-ny.un.org/doc/RESOLUTION/GEN/NR0/218/94/PDF/NR021894.pdf?>). In these documents, it is stated that each state has full authority within the limits of its sovereignty and that no state has the right to intervene in this vast area of sovereignty and internal affairs, regardless of the subject. One section states that such an intervention violates the prohibition on the use of force against the sovereignty and integrity of the state clearly stated in Article 2(4) of the UN Charter, while others say that it is possible according to Article 2(7) of the UN agreement to intervene in the realization of universal human rights.

The most important point to consider is that it is necessary to be careful not to go beyond the actions taken to prevent the violation of human rights of a universal character. Especially in a century when it is already the fourth generation of human rights, the basic ones should be far from being violated and exceeded on any basis (Nuredin, 2023, pp. 9-23).



The right to self-defense is stated in Article 51 of the UN Charter; Namely, it is stated that: nothing in this Charter shall impair the inherent right of individual or collective self-defense in the event of an armed attack against a Member of the United Nations, until the Security Council has taken the necessary measures to maintain international peace and security. Measures taken by Members in the exercise of this right of self-defense shall be immediately forwarded to the Security Council and shall not in any way affect the authority and responsibility of the Security Council under this Charter to take at any time any action it believes necessary to maintain or restore "international peace and security"; it is not considered a violation of Article 2(4), but is characterized as the defense of the attacked state until the intervention of the UN Security Council.

In order for an action to qualify as self-defense, the actions that give rise to the right of self-defense were listed in the 1947 UN General Assembly Aggression Resolution (General Assembly (1947), 3314 (XXIX) Definition of Aggression, <https://documents-dds-ny.un.org/doc/RESOLUTION/GEN/NR0/739/16/IMG/NR073916.pdf?>).

As a second condition of the concept of self-defense, it is necessary to act within the framework of the principle of proportionality, a principle that states that there are limits to self-defense. This limitation emphasizes the necessity of taking action that does not exceed the limit and purpose of self-defense and is proportionate to the attack. In that direction, it is stated that with the elimination of the act of aggression, self-defense should also be eliminated, and if it continues, it will not be considered self-defense (Özkan, 2002, p. 244).

Following the principle of proportionality, the defending state is obliged to inform the Security Council of the details of the actions to be taken and not to exceed the specified limits. The main point is that violence between attack and self-defense should be proportionate and not outweigh each other and that civilian areas should not be targeted (Aksoy, 2016, p. 3).

As a third condition, in the event of an attack on any state, all other methods must be exhausted to be able to defend oneself by force. In addition to these conditions, another issue is that the details of this counter-action, i.e. self-defense and the measures to be taken by the state must be forwarded to the UN Security Council. Although this obligation is enacted by law, it is seen that this right is not respected in practice. Although the Court of Justice maintains that the UN system should be applied to clarify the issue, it states that there is no obligation to report when considering customary law (Alexandrov, 1996, pp. 146-149).

(B) Soft power - the importance of which especially began to increase after the Cold War; it started to be used intensively, especially by Western countries. With the increase in technological development in today's world, the formation of the phenomenon of globalization has distanced states from military power and states have begun to fall into the attraction of "soft power". In this way, the idea began to prevail that problems can be solved by other methods and that international law can be applied without the need for military and economic sanctions (Bilener, 2019, p. 242).

According to Joseph Nye's definition, soft power is an approach that aims to solve problems using a state's cultural, historical and diplomatic influence. Nye explains this as a type of power that can be seen as an alternative to the use of force and in which more diplomatic methods are used rather than coercion in the use of force (Nye, 2011, p. 84). Mechanisms of soft power

play a major role when it comes to the responsibility of states before international law, respecting international agreements regarding their competences and maintaining peace and stability by avoiding aggression and hard power (Hoca, 2020, pp. 109-125).

Especially in today's world, the number of countries using soft power is quite high. For example, the *Monocle Soft Power Survey* in 2014 presented the USA as the most influential country implementing soft power in its foreign policy, while Germany ranks second; countries such as the UK, Japan, Canada, Switzerland, Australia, and even France are some of the top ten countries that effectively use "soft power" as a foreign policy tool in international relations.

States apply methods of "*foreign aid*", "*cultural diplomacy*" and "*public diplomacy*" in the application of "soft power". By using such methods, states aim to solve problems and protect sovereignty within the method of persuasion (Snidal, 2000, p. 430). Soft power, which was the theme of the UN summit in 2005, was accepted by the decision of the General Assembly and took its place in international law (Shaffer & Pollack, 2011). States, especially with the help of institutions such as non-governmental organizations, put the phenomenon of soft power into action in the field of international relations (Nye, 2004, pp. 10-11).

Those who approach soft power with a critical attitude argue that it does not have enough effect by considering soft power in a narrow scope. If we look at the application, it can be said that soft power has a delicate balance. The policies pursued by states determine whether the balance of power between states will be realized within the framework of hard or soft power. On the other hand, the popularity of states in foreign policy practices is also in an important position in terms of their tendency towards soft power and their application among other states. Soft power should be more useful than hard power, both in internal legal order and in external international relations (Korbayram, 2021, pp. 93-108).

In "soft law (power)" it is often possible to find rules that serve to resolve disagreements between the parties. A specific type of this "soft law" are contracts that are expected to come into force. So, multilateral contracts often remain in this state for many years. Their rules are taken into account when interpreting the norms of international law, they influence the practice of states and even national legislation. The report of the Secretary-General of the International Labor Organization on the conventions of this organization notes that, although they have not been ratified, "they will be able to influence legislation and national practice" (Sulaymanov, 2022, pp. 1-4).

As a result, the positive sides of instruments for soft law or soft power can be separated; as already pointed out in various scientific papers, those instruments can offer significant neutralizing advantages in relation to hard law because they are cheaper to negotiate and have smaller "costs of sovereignty". Moreover, they provide more flexibility for states to deal with uncertainty and learn over time. Thus, they allow states to be more ambitious and engage in "deeper" cooperation than they would if they had to worry about enforcement (Shaffer & Pollack, 2011, pp. 1147-1241).

#### 4. FUTURE RESEARCH DIRECTIONS

Countries that have international power, such as the United States, Russia, or China, use the concept of self-defense, which is stated as a right in the UN treaty and the NATO pact, for their own interests on the international stage and to prevent the intervention of the UN within the framework of the security council, with the right of veto. It can be pointed out that such legal

guidance from personal interests overshadows the applicability and credibility of international law. As a debate topic is the hypothesis that the system of the Security Council is easily blocked, and for those reasons, alternative solutions are possible either in terms of voting or in terms of the powers of the Council being transferred to the General Assembly.

As the second subject of discussion, it should be in the form of serious control mechanisms and penal sanctions. In other words, the UN is the hope for the countries that are exposed to it in terms of the use of force, and therefore, the UN must determine mechanisms such as the provision of preventive control mechanisms, especially in the use of hard power.

## 5. CONCLUSION

Through the method of persuasion in international relations, states are guided in a cultural, diplomatic and public way. Considering that soft power is widely used in modern diplomacy and international law, it can be said that it is an important step in terms of maintaining order and not violating human rights against the rules of international law and the Geneva Conventions. Although some researchers question the effectiveness of soft power, the change of states from the use of force to the phenomenon of soft power can be considered as one of the most productive contributions to peace, security and respect of other states in the global order.

Finally, for the correct application of soft power, it is necessary that the structure of the UN be reformed, that is, especially in the field of maintaining peace and collective security. As a basic entity responsible for peace and security, the Security Council in the conditions of the Second World War and the current world differs in many aspects, both technologically and economically, as well as in international relations and the concept of security. So, reforms are needed in the structure and competences and an active conclusion of the General Assembly with active participation in cases of aggression, that is, preventive measures using soft law mechanisms.

## References

- Acer, Y., & Kaya, I. (2011). *Uluslararası Hukuk*. Ankara: USAK Yayınları.
- Aksoy, M. (2016). Önleyici Meşru Müdafaa Hakkı Bağlamında Bush Doktrini ve ABD'nin Irak'ı İşgali. *İnsani ve Sosyal Araştırmalar Merkezi.*, 3.
- Alexandrov, S. A. (1996). *Self-Defense Against the Use of Force in International Law*. The Hague: Kluwer International.
- Bilener, T. (2019). Dış Politika Analizinde Yumuşak Güç – Keskin Güç Karşılaştırması: Çin Örneği. *The Turkish Yearbook of International Relations*, p. 242.
- Evans, M. (2010). *International Law*. London: Oxford University Press.
- Frckoski, L., Georgievski, S., & Petrushevska, T. (2012). *Megunarodno Javno Pravo*. Skopje: Magor.
- Gligorova, A., Sherifi, Q., & Filipovski, Z. (2020). Diplomacy As A Tool For Conflict Prevention And Management. *Vision International Scientific Journal*, 5(2), 9-28. Retrieved from <https://visionjournal.edu.mk/social/index.php/1/article/view/81/81>
- Hoca, E. (2020). Non-contract Liability of the European Union Member States. *Vision International Scientific Journal*, 5(2), 109-125.
- Ilgen, T. (2016). Soft Power and European-American Affairs. In J. S. Nye, & T. Ilgen (Ed.), *Hard Power, Soft Power and the Future of Transatlantic Relations*. London and New York: Routledge.

- Korbayram, A. (2021, March). Relations And Control Mechanisms Between The Legislature And The Executive Bodies In The Macedonian Constitutional Order. *Vision International Scientific Journal*, 6(1), 93-108. doi:<https://doi.org/10.55843/ivisum2116093k>
- Nuredin, A. (2023). Fourth-Generation Human Rights And The violation Of The Concept Of Privacy. *Vision International Scientific Journal*, 8 (1). doi:<https://doi.org/10.55843/ivisum2381009n>
- Nye, J. S. (2004). *Soft Power: The Means to Success in World Politics*. New York: Public Affairs.
- Nye, J. S. (2011). *The Future of Power*. New York: Public Affairs.
- Özkan, A. (2002). Uluslararası Hukukta Birleşmiş Milletler ve Afganistan Operasyonu. *Avrasya Dosyası, BM Özel*, 8(1).
- Shaffer, G., & Pollack, M. A. (2011, March 15). Hard Versus Soft Law in International Security. *Boston College Law Review*, 52, 1147. Minnesota Legal Studies Research Paper No. 11-13. <https://ssrn.com/abstract=1786836>
- Snidal, K. W. (2000). Hard and Soft Law in International Governance. *International Organization* 54, 430.
- Sulaymanov, O. R. (2022). The Role Of “Soft Law” Norms In Regulating contemporary International Relations. *The American Journal of Political Science Law and Criminology*, 4(12), 1-4. doi:<https://doi.org/10.37547/tajpslc/Volume04Issue12-01>



# The Role of Criminal Psychology in Albania's Criminal Justice System

Ivas Konini<sup>1</sup>

Received: July 17, 2023

Accepted: February 26, 2023

Published: March 16, 2024

## Keywords:

Criminal psychology;  
Forensic psychologist;  
Justice system;  
Criminal proceedings;  
Albania

**Abstract:** Forensic psychology is an emerging field that has gained increasing attention in the Albanian justice system. It encompasses the application of psychological knowledge and principles to aid judges, attorneys, and law enforcement officials in understanding complex legal issues, investigating crimes, and making informed decisions. The purpose of this paper is to explore the role and significance of forensic psychology in the Albanian justice system.

Forensic psychologists in Albania play a crucial role in criminal proceedings by providing expert psychological assessments of defendants, witnesses, and victims. They evaluate the mental capacity and state of mind of defendants at the time of the crime, which helps judges and juries to make informed decisions. Forensic psychologists also assist with profiling, risk assessments, and other investigative techniques to aid in criminal investigations.

One of the essential benefits of using forensic psychology in the Albanian justice system is to reduce prejudice and bias. Forensic psychologists provide objective, scientific evidence to the court, which improves the fairness and accuracy of criminal trials.

The challenge facing forensic psychology in Albania is the lack of specialized training and education programs in forensic psychology. There are few professionals in the field, and therefore, forensic psychology services are not widely available. Investing in more education and training programs would increase the number of qualified experts in the field, thus leading to more extensive and effective utilization of forensic psychology in criminal proceedings.

In conclusion, forensic psychology is a vital aspect of the Albanian justice system. Its use can help reduce bias and prejudice in criminal trials while improving the accuracy of decisions. However, the field faces challenges in terms of the need for specialized training and education programs for professionals. By finding the right balance between complexity and variation, we can ensure that our content is engaging and informative.



Creative Commons Non-Commercial CC BY-NC: This article is distributed under the terms of the Creative Commons Attribution-Non-Commercial 4.0 License (<https://creativecommons.org/licenses/by-nc/4.0/>) which permits non-commercial use, reproduction and distribution of the work without further permission.

## 1. INTRODUCTION

Criminal psychology is an essential element in the criminal justice system of Albania. It examines the cognitive, affective, and behavioral processes (Hare et al., 2002) of individuals who participate in unlawful conduct, utilizing insights from disciplines such as psychology, criminology, sociology, and other cognate areas of study. Data analysis can aid in the formulation of evidence-based policies and interventions aimed at preventing criminal activities and mitigating recidivism rates (National Institute of Justice, U.S. Department of Justice, 2019). The field of criminal psychology assumes a crucial function in tackling these challenges by offering a systematic methodology for comprehending criminal conduct and devising efficacious measures for prevention and intervention (McNeil et al., 2014).

<sup>1</sup> Faculty of Law, University of Tirana, "Milto Tutulani" Street, Tirana, Albania

Criminal psychologists in Albania are employed across various professional domains, such as law enforcement agencies, courts, and correctional facilities. The professionals in question engage in the administration of psychological evaluations, furnish specialized testimony in criminal court proceedings, and construct and execute programs aimed at rehabilitating individuals who have committed offenses (American Psychological Association, 2019).

In Albania's criminal justice system, criminal psychology plays a crucial role in comprehending, averting, and managing criminal conduct. The utilization of this tool holds significant potential for enhancing the capacity of law enforcement agencies and criminal justice professionals to safeguard the populace of Albania and uphold the principles of justice (Poli & Campobasso, 2016). Criminal profiling refers to the systematic approach of developing a psychological profile of a perpetrator by analyzing crime scene evidence, witness testimonies, and other relevant information (Turvey, 2017). The utilization of offender profiling can prove to be a beneficial technique in the resolution of criminal cases and the determination of culprits, as it offers valuable insights into the perpetrator's behavioral patterns, personality traits, and underlying motivations.

The utilization of criminal profiling within Albania's criminal justice system is presently in its nascent phase; however, it is progressively being acknowledged as a potent mechanism for resolving criminal cases. The Albanian National Police (ANP) has instituted a unit dedicated to criminal profiling, tasked with conducting investigations, scrutinizing crime scene evidence, and constructing profiles of perpetrators (Albanian State Police, n.d.). The department collaborates closely with various law enforcement entities and employs a variety of methodologies, such as behavioral analysis and crime scene reconstruction, to construct precise offender profiles.

An instance of effective criminal profiling in Albania pertains to the examination of a sequence of homicides perpetrated by a serial offender who was identified as the "Monster of Lake Ohrid". The identification of the offender was facilitated by the criminal profiling unit, which analyzed crime scene evidence and witness statements to construct a comprehensive profile of the offender's personality, motives, and behaviors. The utilization of the profile aided the ANP in narrowing down their inquiry to particular individuals of interest, culminating in the apprehension and sentencing of the perpetrator.

A further instance pertained to the utilization of criminal profiling as a means of resolving a bank robbery incident that transpired in Tirana. The offender's profile was developed by the criminal profiling unit through the analysis of witness statements and surveillance footage, ultimately aiding the ANP in the identification and subsequent apprehension of the suspect.

In the context of Albania's criminal justice system, criminal profiling is deemed to be a valuable instrument for crime resolution and the identification of suspects. Given the ongoing evolution and development of the field, it is probable that criminal profiling will assume an increasingly crucial role in law enforcement investigations and prosecutions (Douglas et al., 2016).

## 2. ETHICS IN CRIMINAL PSYCHOLOGY AND CRIMINAL PROFILING ALBANIA

The most important details in the realm of criminal psychology in Albania are ethics and professionalism. To ensure responsible and ethical conduct, criminal psychologists are required to comply with a set of professional and ethical standards established by the American Psychological Association (2002). The Albanian National Police<sup>2</sup> has implemented measures to ensure that

<sup>2</sup> From now on, ANP.

forensic psychologists operating within the organization comply with ethical and professional norms. The ANP has formulated a regulation ([Republic of Albania, Ministry of Internal Affairs, 2015](#)), which also refers to criminal psychologists, that draws upon the APA's code of ethics and delineates standards for ethical behavior, confidentiality, and informed consent.

The criminal justice system in Albania is hindered by insufficient resources, such as inadequate funding and training opportunities. However, there are prospects for enhancing ethical and professional norms, such as the establishment of instructional curricula for forensic psychologists that emphasize ethical and professional comportment. This could involve collaboration with international organizations that have expertise in the field of criminal psychology, allowing Albanian criminal psychologists to benefit from cutting-edge research and optimal methodologies.

An additional prospect involves the creation of a regulatory entity or organization that could supervise the activities of criminal psychologists in Albania, guaranteeing their compliance with ethical and professional norms.

In summary, despite the obstacles that impede the enhancement of ethical and professional norms within Albania's criminal justice system, there are prospects for advancement. Albania can enhance the ethical and professional standards of criminal psychologists operating within the system by allocating resources, providing training, and promoting collaboration. This measure can lead to an improvement in the quality of justice dispensed to victims and society at large.

The practice of criminal profiling also referred to as offender profiling, involves the examination of evidence found at a crime scene and other pertinent data in order to construct a comprehensive profile of the individual responsible for the commission of the crime. The utilization of this methodology can prove to be a beneficial instrument in the resolution of criminal cases, particularly those that are intricate and arduous to scrutinize. The utilization of criminal profiling can assist investigators in the process of narrowing down potential suspects, detecting patterns in criminal behavior, and gaining insights into the motivations and characteristics of the offender ([Jackson & Bekerian, 1997](#)).

Criminal profiling is a recently introduced practice in Albania that has demonstrated its efficacy in crime resolution. An example of this is the "Highway Killer," a serial murderer who preyed on young women along the highway. Albanian law enforcement collaborated with experts in criminal profiling to construct a comprehensive profile of the perpetrator, which led to the identification of the offender. An example of this is the occurrence of a bank heist in Tirana. Through a meticulous examination of the evidence found at the scene of the crime, encompassing the modus operandi and the specific implements employed, experts in criminal profiling were able to furnish law enforcement officials with a comprehensive characterization of the individuals responsible. This data assisted law enforcement in recognizing and detaining the suspects.

To sum up, the utilization of criminal profiling is an advantageous technique for resolving intricate criminal cases within the criminal justice system of Albania. Criminal profilers are capable of furnishing law enforcement agencies with significant insights regarding the identity, behavior, and motivations of perpetrators by scrutinizing crime scene evidence and other pertinent information. Although criminal profiling is a recent development in Albania, it has already yielded positive outcomes in the resolution of criminal cases.

### 3. THE ROLE OF CRIMINAL PSYCHOLOGISTS IN ASSESSING MENTAL HEALTH AND CRIMINAL RESPONSIBILITY

Mental health is an important part of the criminal justice system in Albania, where legal statutes and directives oversee the management of mentally ill perpetrators and their culpability for criminal acts. An individual who perpetrates an offense while experiencing a state of mental illness or defect is exempt from criminal liability, but the determination of mental illness or defect requires the assessment of qualified professionals.

Criminal psychologists in Albania play a crucial role in assessing mental health and criminal responsibility. They are responsible for evaluating the mental state of offenders and determining whether they are competent to stand trial and understand the nature of their actions. Criminal psychologists employ diverse techniques to assess the psychological condition of perpetrators, including:

- Clinical interviews are used by criminal psychologists in Albania to evaluate the psychological condition of a perpetrator. The interview is conducted in a secluded environment and can range from a few minutes to several hours. It is designed to elicit details about the offender's personal history, present psychological state, and possible mental disorders. In the course of the clinical interview, the psychologist may inquire about the offender's background, including their familial, educational, and occupational histories. The inquirer may also inquire about the present psychological condition of the perpetrator, encompassing their affective state, emotional disposition, and conduct. Furthermore, the psychologist may elicit information regarding any indications of psychiatric disorders, such as perceptual distortions or false beliefs. Clinical interviews are tailored to the unique requirements of the offender, allowing the psychologist to adapt the interview format or questions based on their cultural background, age, or language proficiency. The objective is to gather data about the perpetrator's psychological condition.
- Psychological assessments are utilized to assess the mental condition, personality characteristics, and cognitive capacities of offenders.
  - The Minnesota Multiphasic Personality Inventory (MMPI) is a psychometric assessment tool used to evaluate mental health disorders and personality characteristics (Pali & Sula, 2015). It is composed of 567 true/false questions that assess a range of psychological constructs, including depression, anxiety, hostility, and self-esteem (PsychTest, n.d.). The collected responses are then analyzed to determine the existence of any mental health disorders or personality characteristics. The MMPI is a valuable tool for detecting individuals who exhibit indications of prior mental health conditions, personality maladjustments, or psychopathic tendencies.
  - The Rorschach Inkblot Test (Rorschach.org, 2023) is a frequently employed assessment tool that is utilized to evaluate an individual's cognitive processes, affective functioning, and dispositional traits. In the course of this assessment, the perpetrator is provided with a set of ten inkblot cards and instructed to articulate their perceptions of each card. Subsequently, the collected responses are subjected to analysis to identify discernible trends in cognitive processes and affective operations.
  - Additional psychological assessments utilized by forensic psychologists in Albania comprise the Wechsler Adult Intelligence Scale (WAIS) (Genius Tests, n.d.), which evaluates the cognitive aptitudes of a perpetrator. The Wechsler Adult Intelligence Scale (WAIS) assesses an individual's cognitive aptitudes across multiple domains, such as verbal comprehension, perceptual reasoning, working memory, and



- processing speed. The utilization of the Wechsler Adult Intelligence Scale (WAIS) can facilitate forensic psychologists in comprehending an offender's cognitive functioning and capacity to comprehend the essence of their conduct.
- The Thematic Apperception Test (TAT) (Psychestudy, n.d.) is utilized by forensic psychologists in Albania as a means of evaluating the personality and cognitive patterns of individuals who have committed offenses. The assessment involves the presentation of a sequence of equivocal visual stimuli to the participant, who is then instructed to generate a narrative for each image. The narratives crafted by individuals have the potential to reveal their subconscious drives, convictions, and inner struggles. The utilization of the Thematic Apperception Test (TAT) can provide valuable insights for forensic psychologists to comprehend the mental condition and personality characteristics of a perpetrator. This information can be utilized to enhance the effectiveness of treatment and rehabilitation interventions.
  - Observation is an essential technique employed by forensic psychologists in Albania to collect data pertaining to an offender's conduct, affective states, and social interactions. A forensic psychologist may conduct an observation of an offender during a therapy session to evaluate their aptitude for communication, emotional regulation, and the capacity to establish positive relationships. Throughout the session, the psychologist may engage in the observation of the offender's behavior towards the therapist, encompassing their degree of involvement, eye contact<sup>3</sup>, and body language (Psychology Today, 2021). Practitioners can observe and evaluate the reactions of perpetrators towards various therapeutic interventions, including relaxation techniques<sup>4</sup> and cognitive behavioral therapy<sup>5</sup>. Observation can be used to evaluate an offender's conduct during interactions with correctional officers or fellow inmates. It can yield significant knowledge regarding their psychological condition, conduct, and likelihood of recidivism. Forensic psychologists can make informed decisions regarding treatment and rehabilitation efforts by observing an offender's behavior and interactions. Observations can help develop a more comprehensive understanding of offender behavior, facilitating the recommendation of appropriate interventions to mitigate the likelihood of recidivism.

Instances of mentally ill offenders have been observed within Albania's criminal justice system. An illustrative instance pertains to an individual who, while grappling with acute mental illness, committed murder. According to the assessment conducted by the criminal psychologist, the offender was deemed not criminally responsible on account of his mental illness. Consequently, the perpetrator was committed to a psychiatric facility for therapeutic intervention instead of receiving a custodial sentence. A further instance pertained to an individual with a

<sup>3</sup> Offenders who are leaning forward, making eye contact, and nodding their head may indicate engagement and openness to discussion.

<sup>4</sup> Relaxation exercises are techniques used to reduce stress and anxiety and promote relaxation. They can include deep breathing, progressive muscle relaxation, guided imagery, and meditation. During therapy sessions, a forensic psychologist may use these techniques to help an offender manage their emotions and behavior. The psychologist will observe the offender's response to each technique to determine which one is most effective for them and develop a personalized treatment plan.

<sup>5</sup> Cognitive-behavioral therapy (CBT) is a therapeutic technique used by forensic psychologists in Albania to help offenders overcome their criminal behavior patterns. In CBT sessions, the offender works with the psychologist to identify negative thought patterns and develop strategies to replace them with more positive ones. The psychologist may also help the offender identify triggers for their negative behaviors and develop strategies to avoid or cope with them. By assessing an offender's response to CBT, a forensic psychologist can gain insight into their level of cognitive functioning, emotional regulation, and ability to learn and apply new skills.

mental illness who faced charges of assault and battery. According to the assessment conducted by the criminal psychologist, the defendant's mental illness rendered him unfit to stand trial. Subsequently, the perpetrator was transferred to a mental health facility to receive medical attention.

To conclude, the significance of mental health is paramount in Albania's criminal justice system. The evaluation of culpability in criminal cases necessitates the expertise of mental health practitioners, specifically criminal psychologists. Instances of mentally ill offenders within Albania's criminal justice system have been documented. The application of criminal psychology has facilitated the provision of suitable interventions for these individuals, thereby averting their exposure to punitive measures.

#### 4. FORENSIC PSYCHOLOGY IN ALBANIA

Forensic psychology is the application of psychological theories and practices in legal contexts, encompassing criminal inquiries, judicial proceedings, and the management of individuals implicated in the criminal justice system. It has gained recognition as a valuable tool in Albania's criminal justice system.

Forensic psychologists in Albania aid law enforcement agencies in their investigations by:

- Offering their expertise in criminal behavior and motivation, with the aim of providing valuable insights. The task at hand may encompass scrutinizing the evidence obtained from a crime scene and providing proficient assessments of the possible incentives, characteristics, and conduct patterns of the perpetrator. By comprehending the cognitive and motivational factors of the perpetrator, law enforcement officials can optimize their endeavors and allocate resources more effectively toward the detection and capture of suspects (Ministry of Justice, 2021).
- Assessing witness testimony and evidence entails the examination of the dependability and believability of witness accounts, in addition to the evaluation of the caliber and importance of any tangible evidence discovered at the site of the crime. Forensic psychologists possess specialized knowledge and skills that enable them to offer significant contributions in the form of insights and perspectives that can aid in the discovery of truth and the administration of justice.
- Conducting offender profiling - Offender profiling is a methodical approach to constructing a psychological profile of a perpetrator (American Psychological Association, n.d.) by examining crime scene evidence, which may include factors such as age, gender, personality traits, occupation, or lifestyle. In Albania, forensic psychologists employ diverse methodologies to construct these profiles, which can assist law enforcement agencies in their investigations by limiting the number of potential suspects. Notwithstanding, it should be noted that profiles do not serve as conclusive evidence of culpability, and the practice of offender profiling is not without its constraints.
- Providing expert testimony in criminal trials by evaluating the competency of defendants to stand trial - Forensic psychologists in Albania are instrumental in the legal system as they assess the mental health and competency of defendants to stand trial, thereby providing expert testimony in criminal trials. The evaluators determine the defendant's competence to comprehend the accusations leveled against them and their ability to aid in their legal representation. Upon completion of their assessment, they may offer professional testimony in a court of law to apprise the presiding judge and jury of their conclusions. The

aforementioned data is crucial to guaranteeing that accused individuals are granted a just trial and that the principles of justice are upheld.

- Assessing the mental state of defendants at the time of the offense - Forensic psychologists can assess the mental state of defendants at the time of the offense to identify potential contributing factors, such as mental illness, emotional distress, or other psychological factors. This data can be used in legal proceedings to determine culpability and determine appropriate penalties (American Psychological Association, n.d.).
- Assisting judges in determining appropriate sentencing and rehabilitation measures for convicted offenders - Forensic psychologists in Albania offer their expertise to judges in determining appropriate sentencing and rehabilitation measures for convicted offenders based on their psychological state. This data can help judicial authorities determine suitable sentencing and supplementary interventions, such as therapy or counseling, to mitigate the probability of recidivism.

Notable cases in Albania have seen forensic psychologists evaluate the mental state of defendants, contributing to the court's decisions (Taylor & Francis Group, 2016).

Overall, forensic psychology has become an important field in Albania's criminal justice system, providing valuable insights and expertise that can help ensure justice is served in criminal cases.

## **5. KEY POINTS AND RECOMMENDATIONS REGARDING THE CHALLENGES THAT FORENSIC PSYCHOLOGY IS FACING IN THE ALBANIAN LEGAL SYSTEM**

The field of forensic psychology encounters various obstacles in Albania. Insufficient resources, such as inadequate funding and personnel, represent a significant obstacle. The aforementioned circumstances can pose a challenge for forensic psychologists in carrying out exhaustive evaluations and furnishing all-encompassing assessments within a reasonable timeframe. Furthermore, forensic psychologists in Albania may have limited access to specialized training and opportunities for professional development. To mitigate the issue of scarce resources, it is suggested that the Albanian government increase its allocation of funding and resources towards forensic psychology services and research. Potential strategies to address the issue at hand may involve augmenting the quantity of resources allocated towards forensic evaluations, such as by bolstering the number of personnel and facilities and enhancing the provision of educational and training opportunities for forensic psychologists. Furthermore, the establishment of partnerships and collaborations with international organizations and experts may be considered a means to augment resources and expertise towards enhancing the caliber and efficacy of forensic psychology services in Albania. Ultimately, it is imperative to undertake initiatives aimed at enhancing public consciousness regarding the significance of forensic psychology and the requisite allocation of sufficient resources and assistance to guarantee efficacious and equitable results within the legal framework.

An additional obstacle pertains to the necessity for enhanced cooperation among forensic psychologists, law enforcement entities, and other practitioners engaged in the realm of criminal justice. This entails enhancing inter-agency communication and coordination as well as facilitating unfettered access to pertinent information and resources for forensic psychologists. To improve the collaboration between forensic psychologists and law enforcement agencies in Albania, it is recommended to establish regular training sessions and workshops that bring

together professionals from different fields to share their expertise and experiences. This will not only improve communication and coordination but also help identify and address any gaps or issues in the system. It is also important to ensure that forensic psychologists have access to all relevant information and resources, including up-to-date technology and equipment, to facilitate their work and improve the quality of their assessments.

Forensic psychologists in Albania may encounter cultural and societal obstacles that could potentially affect their professional endeavors. Instances of stigmatization about mental health and a dearth of comprehension regarding the function of forensic psychology within the realm of the justice system may exist. The aforementioned circumstances may result in a lack of confidence and an unwillingness to collaborate with forensic psychologists. In order to tackle the cultural and societal obstacles, it is imperative to enhance awareness and provide education to the general populace regarding the significance and function of forensic psychology within the legal system. Achieving this objective can be facilitated by means of public outreach and educational initiatives, in addition to forging partnerships with community leaders and organizations. Incorporating the participation of mental health experts and advocates from the local community in the formulation and execution of forensic psychology methodologies in Albania could prove advantageous. This approach may foster confidence and enhance comprehension among all parties concerned.

In Albania, the field of forensic psychology has demonstrated advancements; however, there remains a need to confront these challenges and enhance the implementation of forensic psychology within the nation.

## References

- Albanian State Police. (n.d.). Criminal profiling in Albania. Retrieved May 16, 2023, from [https://www.asp.gov.al/?page\\_id=234](https://www.asp.gov.al/?page_id=234).
- American Psychological Association. (n.d.). Forensic psychology. Retrieved from <https://www.apa.org/ed/precollege/psn/2013/09/forensic-psychology>.
- American Psychological Association. (2002). Ethical principles of psychologists and code of conduct. *American Psychologist*, 57(12).
- American Psychological Association. (2019). The role of psychologists in the criminal justice system.
- Douglas, J. E., Olshaker, M., Burgess, A. W., & Ressler, R. K. (2016). The future of criminal profiling. *Applied Psychology in Criminal Justice*, 12(1).
- Genius Tests. (n.d.). Sample Wechsler test questions. Retrieved May 16, 2023, from <https://geniustests.com/test-preparations/sample-wechsler-test-questions>
- Hare, R. D., Clark, D., Grann, M., & Thornton, D. (2002). Psychopathy and the predictive validity of the PCL-R: An international perspective. *Behavioral Sciences & the Law*, 20(2).
- Jackson, J. L., & Bekerian, D. A. (1997). Offender profiling: A review of the literature. *Journal of Police and Criminal Psychology*, 12(1).
- McNeil, D., Freckelton, I., & Gudjonsson, G. (2014). Psychology, crime and law: The intersection. *Criminal Justice Matters*, 98(1).
- Ministry of Justice. (2021). Annual Report 2020. Retrieved May 16, 2023, from <https://drejtesia.gov.al/wp-content/uploads/2021/07/Raporti-Vjetor-MPJ-2020.pdf>.
- National Institute of Justice, U.S. Department of Justice. (2019). Reducing recidivism through evidence-based practices.

- Pali, G., & Sula, E. (2015). The role of forensic psychology in the Albanian legal system. *International Journal of Criminology and Sociology*, 4.
- Poli, M., & Campobasso, C. P. (2016). The role of criminal profiling in the Italian criminal justice system: A reflection on the situation. *International Journal of Law, Crime and Justice*, 45.
- Psychestudy. (n.d.). Thematic Apperception Test. Retrieved May 16, 2023, from <https://www.psychestudy.com/general/personality/thematic-apperception-test>
- Psychology Today. (2021, September 7). What Is Body Language? Retrieved May 16, 2023, from <https://www.psychologytoday.com/us/basics/body-language>.
- PsychTest. (n.d.). About the MMPI. Retrieved May 16, 2023, from <https://psychtest.net/about-the-mmpi/>
- Republic of Albania, Ministry of Internal Affairs. (2015). State Police Regulation. Retrieved May 16, 2023, from [https://mb.gov.al/wp-content/uploads/2018/02/RREGULLORE\\_E\\_POLICISE\\_SE\\_SHTETIT\\_-\\_2015.pdf](https://mb.gov.al/wp-content/uploads/2018/02/RREGULLORE_E_POLICISE_SE_SHTETIT_-_2015.pdf).
- Rorschach.org. (2023). International Society of the Rorschach and Projective Methods. Retrieved May 16, 2023, from <https://www.rorschach.org/>
- Taylor & Francis Group. (2016, August 23). Forensic psychology in Albania: An emerging discipline.
- Turvey, B. E. (2017). *Criminal profiling: An introduction to behavioral evidence analysis*. Elsevier.





# Earth-Fault Detection Using Fuzzy Logic in Electrical Distribution Networks

Razvan Moise<sup>1</sup> 

Received: July 25, 2023

Accepted: January 5, 2024

Published: March 16, 2024

## Keywords:

Fuzzy logic;  
Expert systems;  
Earth-fault detection;  
Petersen coil;  
Admittance method

**Abstract:** *The optimal functioning of electrical distribution networks is to maintain the voltage to acceptable limits in order not to affect the insulation of the electric lines. During a nominal regime the voltage variation is not so big due to the several voltage regulation methods, but during a fault regime, usually during earth-faults can occur overvoltages that affect the line insulation. That is why earth-fault must identified and eliminated as quickly as possible.*

*In the present medium voltage networks, the earth-fault detection is made using the admittance and current injection method. That means that in the normal regime, the system measures the reference homopolar admittances of every electric line that is supplied from the substation busbar after each tuning cycle for the Petersen Coil. By injecting a current in the coil it can discover the line with the biggest asymmetry in a 20-30ms time interval, which is the earth-faulted line. This method is perfectly functional when is precisely known the homopolar current and the capacitive current of the grid. There are projects where the Holmgreen filter is chosen with a big nominal current and the measuring of the homopolar current is done with errors because of the small earth-fault current in the medium voltage networks with Petersen coil and this way the earth-fault detection can function with errors. The classic method needs precise data in order to have good results.*

*The article is researching the possibility of detecting the earth-faults with fuzzy logic. The fuzzy logic uses artificial intelligence and allows earth-fault detection even if the input data is not so accurate because of the errors given by the instrument transformers. So using several logic rules, the phase and the circuit with earth fault can be successfully identified even if the input data is not so precise.*

*The expert fuzzy systems can be successfully used in earth-fault detection and also in detecting any kind of fault with superior results to the classical method because using the data with errors can obtain good results using the logic small, normal, and big for currents and voltages in the system can take decisions similar to the human operator.*



Creative Commons Non Commercial CC BY-NC: This article is distributed under the terms of the Creative Commons Attribution-Non-Commercial 4.0 License (<https://creativecommons.org/licenses/by-nc/4.0/>) which permits non-commercial use, reproduction and distribution of the work without further permission.

## 1. INTRODUCTION

The main cause of earth-faults in an overhead distribution line is the failure or puncture of the insulator. The insulators are used in overhead transmission lines to provide insulation between the live conductor and metallic towers that are already connected with the earth's surface.

The main cause of earth-faults in cable distribution networks is damaging the insulation of the cables during work for another utility or the aging of the cable insulation.

During a fault earth-faults regime the overvoltages can affect the line insulation. That is why earth-faults must identified and eliminated as quickly as possible with maintenance techniques.

<sup>1</sup> Transilvania University of Brasov, 29 Eroilor Bulevard, Postal Code 500036, Braşov, România

Modern maintenance techniques become a competitive major advantage thanks to the fault detection early before the line insulation needs a major repair.

Remote monitoring technologies and on-site diagnosis on the maintenance using artificial intelligence can maximize the continuity of electrical energy delivery and reduce costs caused by energy delivery shutdown.

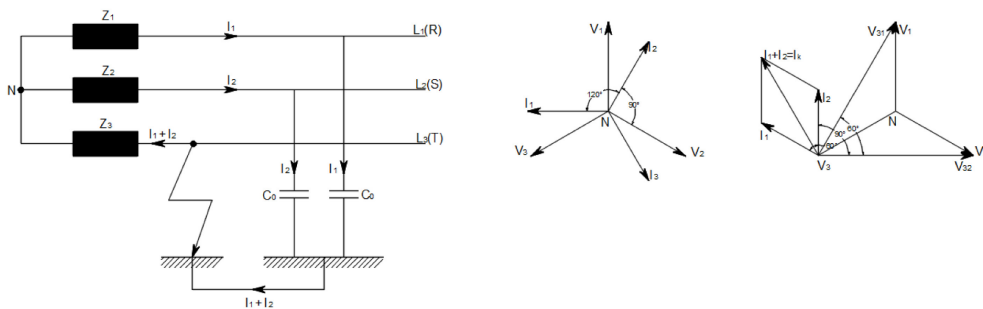
Integrating smart monitoring systems - using artificial intelligence - performs tracking in real-time of the condition of a distribution electrical network, and of the performances of its critical components. Preventive maintenance is the combination of activities consisting of monitoring and regular inspections. Its purpose is to avoid any possible replacement of the faulty line - as an expensive interventional corrective solution. This level of maintenance is the most efficient solution and a necessary solution to implement.

## 2. EARTH-FAULT CURRENTS IN MEDIUM VOLTAGE ELECTRICAL DISTRIBUTION NETWORKS

### 2.1. Earth-fault current in a neutral insulated system

The neutral insulated system is used mostly in medium voltage networks with short lengths. That means the using of this kind of neutral treatment is for networks with low capacitive currents, usually below 10A.

Figure 1 represents the equivalent diagram for a balanced triphasic system with insulated neutral and the electrical parameters used in it. There are represented the phasor diagram in normal and earth-fault regimes.



**Figure 1.** Diagram for earth-fault detection in a neutral insulated system

**Source:** Own calculations

During an earth-fault the neutral potential changes from the earth potential to the potential of the faulted phase ( $V_3 = V_N$ ). In this way, the potentials of the good phases will rise  $\sqrt{3}$ , and the angle between them will be changed from  $120^\circ$  to  $60^\circ$ . The earth-fault current  $I_k$  is defined as a sum of the capacitive currents that flow on the good phases according to [Wadhwa \(2012\)](#) and [Schlabach and Rofalski \(2008\)](#).

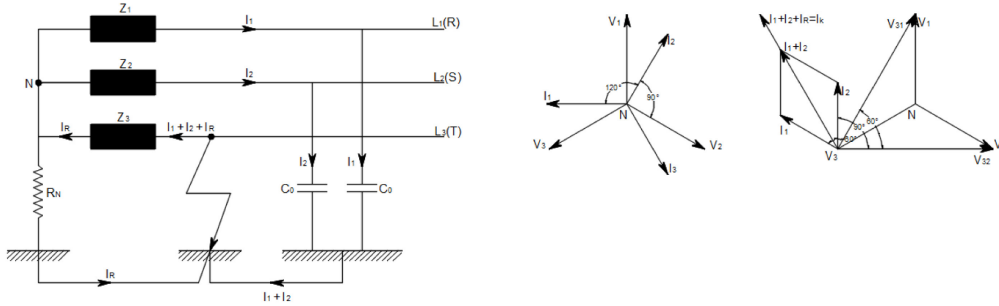
$$I_k = I_1 + I_2 \quad (1)$$

If this method is used in networks with big capacitive current, during an earth-fault the voltage on the good phases could be 4 times bigger than the phase voltage according to [Weedy et al. \(2012\)](#).



### 2.2. Earth-Fault Current in Distribution Networks Treated with Resistance

Figure 2 represents the equivalent diagram for a balanced triphasic system with neutral treated by resistance and the electrical parameters used in it. There are represented the phasor diagram in normal and earth-fault regimes.



**Figure 2.** Diagram for earth-fault detection in distribution networks treated with resistance

**Source:** Own calculations

During an earth-fault the neutral potential changes from the earth potential to the potential of the faulted phase ( $V_3 = V_N$ ). In this way, the potentials of the good phases will rise  $\sqrt{3}$ , and the angle between them will be changed from  $120^\circ$  to  $60^\circ$ . The earth-fault current  $I_k$  is defined as a sum of the capacitive currents that flow on the good phases. The earth potential  $V_f$  will be different from the neutral potential and through the resistance will flow a current in the same sense as the earth-fault current related to the resistance according to [Wadhwa \(2012\)](#) and [Schlabback and Rofalski \(2008\)](#).

$$I_R = V_f / R_N \tag{2}$$

So, the compensated earth-fault current will be:

$$I_f = I_k + I_R \tag{3}$$

That means that any earth-fault current is boosted with the current flowing through the resistance in the faulted regime and in this way can be easily detected.

This method is used in small cable networks or in big networks where the capacitive currents are very high and another method is expensive. Because of the big currents that are flowing through the earth during an earth-fault, the entire network must have good earthing, which in the case of long overhead lines is very expensive.

### 2.3. Earth-Fault Current in Distribution Networks Treated with Petersen Coil

Figure 3 represents the equivalent diagram for a balanced triphasic system with neutral treated by Petersen Coil and the electrical parameters used in it. There are represented the phasor diagram in normal and earth-fault regimes.

During an earth-fault the neutral potential changes from the earth potential to the potential of the faulted phase ( $V_3 = V_N$ ). In this way, the potentials of the good phases will rise  $\sqrt{3}$ , and the

angle between them will be changed from 120° to 60°. The earth-fault current  $I_K$  is defined as a sum of the capacitive currents that flow on the good phases. However, the earth potential  $V_f$  will be different than the neutral potential and through the Petersen coil will flow a current on the opposite side with the earth-fault current related to the coil impedance according to [Wadhwa \(2012\)](#) and [Schlabach and Rofalski \(2008\)](#).

$$I_L = I_L \cdot V_f / (\omega L) \quad (4)$$

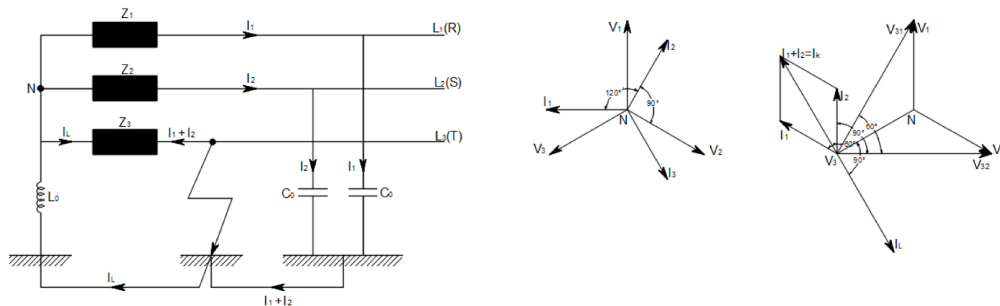
So, the compensated earth-fault current will be:

$$I_f = I_k - I_L \quad (5)$$

The condition for the resonance point of the coil is:

$$I_k = I_L \quad (6)$$

This method is used in most distribution networks because of its advantages. The earth-fault current is very small so the electric arc at the place of the fault turns itself off. However, if the capacitive current is very high, this method could be very expensive.



**Figure 3.** Diagram for earth-fault detection in distribution networks treated with Petersen Coil

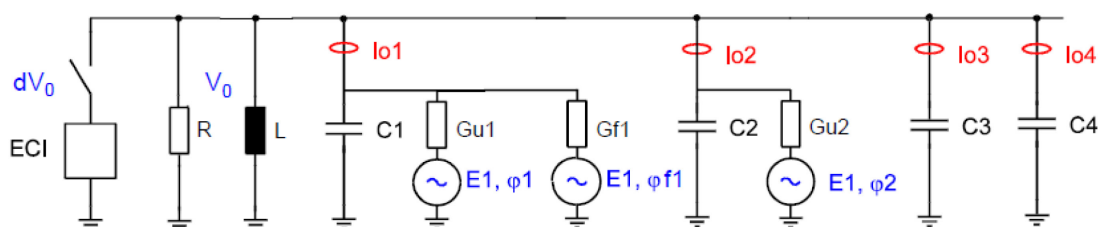
Source: Own calculations

### 3. EARTH-FAULT DETECTION IN MEDIUM VOLTAGE ELECTRICAL DISTRIBUTION NETWORKS

The easy earth-fault detection is done in the networks treated with resistance and insulated because of the high current that flows during the fault. In the networks treated with Petersen Coil the earth-fault current is very small because of the coil current that opposes the capacitive current of the good phases and the detection of earth-faults is hard to do with precision.

The common method to detect earth-faults in electrical distribution networks is the admittance and current injection method. It detects the earth-faults by making a current injection after each setpoint of the Petersen Coil, for measuring the homopolar admittances of the lines connected to the busbar. The measured values are compared with the reference admittances. The line with the biggest asymmetry is the faulted line and can be detected in a period of 20-30 ms according to [Trench Austria GMBH \(2003\)](#) and [Vasilievici et al. \(2003\)](#).

Figure 4 is an example of a medium-voltage busbar with different types of electric lines. Two lines are with loading and two lines are functioning but not loaded.



**Figure 4.** Diagram for earth-fault detection using the admittance method [6]

Source: Trench Austria GMBH, 2003

However, this method needs high-precision measurements in order to give good results. If the homopolar current is measured with errors, the detection of the faulted line is not done properly. To solve this problem we can use artificial intelligence in order to detect not only the earth-fault of a line but any kind of fault. The next chapter describes the fuzzy logic solution in order to detect faults on a line.

#### 4. EARTH-FAULT DETECTION IN MEDIUM VOLTAGE ELECTRICAL DISTRIBUTION NETWORKS USING THE FUZZY LOGIC

The expert system will use fuzzy logic in order to detect the faults on the electric lines. The inputs for the system will be the current on each phase, the homopolar current, the voltages on each phase, and the homopolar voltage.

In the fuzzy system, the variables can take values between 0 and 1, and using the rules we can detect the outputs using approximate values for inputs according to Takagi and Sugeno (1985) and Zadeh (1989).

For each input, we set 3 levels: “L” – Low; “N”- Normal, and “H”- High for approximation and building of the logical rules in the table below.

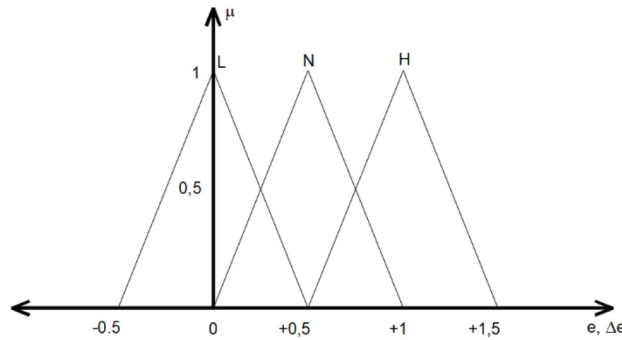
**Table 1.** The Inputs and Outputs of The Fuzzy System

Rules	Input variables								Output Variables
	$I_1$	$I_2$	$I_3$	$I_0$	$V_1$	$V_2$	$V_3$	$V_0$	State
1.	N	N	N	N	N	N	N	N	No Fault
2.	H	N	N	H	L	H	H	H	L1-G
3.	N	H	N	H	H	L	H	H	L2-G
4.	N	N	H	H	H	H	L	H	L3-G
5.	H	H	N	H	L	L	H	H	L1,2-G
6.	H	N	H	H	L	H	L	H	L1,3-G
7.	N	H	H	H	H	L	L	H	L2,3-G
8.	H	H	N	H	L	L	N	H	L1,2
9.	H	N	H	H	L	N	L	H	L1,3
10.	N	H	H	H	N	L	L	H	L2,3
11.	H	H	H	H	L	L	L	L	L1,2,3

Source: Own research

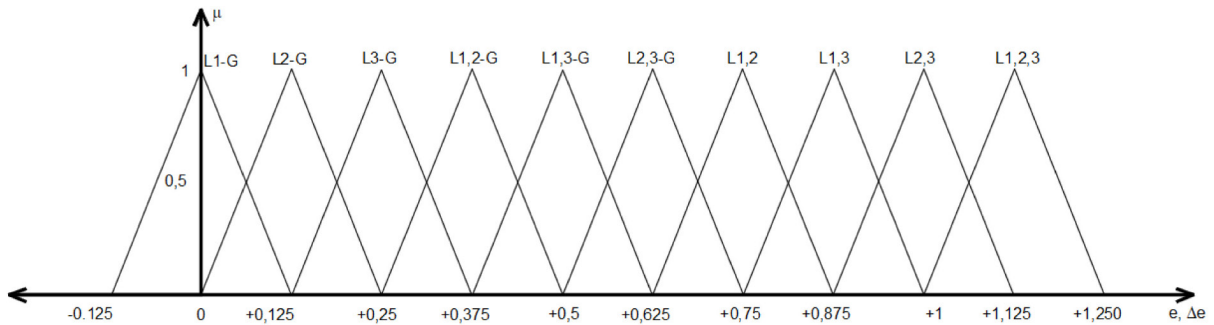
Where: N – Normal, L – Low, H – High,  $I_1$  – Phase L1 Current,  $I_2$  – Phase L2 Current,  $I_3$  – Phase L3 Current,  $I_0$  – Homopolar Current,  $V_1$  – Phase Voltage L1,  $V_2$  – Phase Voltage L2,  $V_3$  – Phase Voltage L3,  $V_0$  – Homopolar Voltage, L1-G–Eartfault L1, L2-G–Eartfault L2, L3-G–Eartfault L3, L1,2-G–Eartfault L1, L2, L1,3-G–Eartfault L1, L3, L2,3-G–Eartfault L2-L3, L1,2–Biphasic Fault L1-L2, L1,3–Biphasic Fault L1-L3, L2,3–Biphasic Fault L2, L3, L1,2,3 – Triphasic Fault.

The simulation of this system was done using the program Matlab/Simulink. The defining of the membership function for input variables is done with the Mamdani Method, each input will be defined on a certain interval: L – Low – [-0,5 0 0,5], N – Normal – [0 0,5 1], H – High – [0,5 1 1,5]



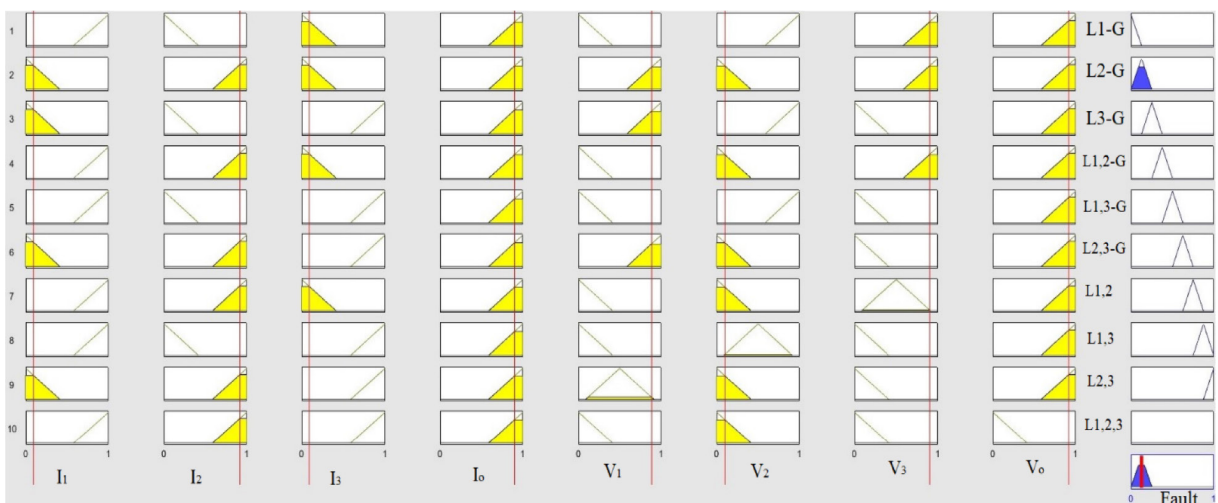
**Figure 5.** The membership functions for inputs  
 Source: Own research

Also, we define the membership for output variables:



**Figure 6.** The membership functions for outputs  
 Source: Own research

If we try to simulate the earth-fault for L2, that means we will use rule 2 from Table 1 to obtain the results in the below figure.



**Figure 7.** Results for simulation earth-fault on phase L2  
 Source: Own research

## 5. CONCLUSION

The admittance and injection current method in detecting earth-faults has good results as long as the input data is measured with very high accuracy. If the data is not accurate, the detection method can lead to bad functioning of the system because the relay will not have the exact information as in reality.

Here we have the improvement with the fuzzy system which in this article was simulated for one electrical line, but it can be adapted for any substation, with one fuzzy regulator for each line. The admittance method usually is used to detect earth-faults in the networks treated with Petersen coil, but this fuzzy system can detect earth-faults in any electrical network no matter how the neutral is treated.

The fuzzy system for detecting earth-faults can be successfully used in substations, it doesn't need accurate measurements because the output is related to some logic rules and is calculated based on the same percentage of uncertainty as the inputs have. With a smaller rate of fault in detecting the earth-fault, the fuzzy system can save money because any earth-fault detected and eliminated in time protects the electric line insulation and ensures that the other consumers in the substation are supplied with electricity in parameters.

## References

- Schlabbach, J., & Rofalski, K.-H. (2008). *Power System Engineering*. Wiley-Vch Verlag GMBH & Co. KGaA, Weinheim. ISBN: 978-3-527-40759-0, 263-284.
- Takagi, T., & Sugeno, M. (1985). Fuzzy identification of systems and its applications to modeling and control. *IEEE Transactions on Systems, Man, and Cybernetics*, 15, 116–132.
- Trench Austria GMBH. (2003). *Neutral Point Treatment. Technical Product Presentation*, 51-95.
- Vasilievici, A., Colceriu, M., & Stanescu, D. (2003). Digital Equipment Used in Earth Compensated Networks for Automatic ASC Tuning and Selective Earth-fault Detection.
- Wadhwa, C. L. (2012). *Electrical Power Systems*. New Academic Science Limited, Kent, UK. ISBN: 978-1-906574-39-0, 247-295.
- Weedy, B. M., Cory, B. J., Jenkins, N., Ekanayake, J. B., & Strbac, G. (2012). *Electric Power Systems*. Fifth Edition, John Wiley and Sons. ISBN: 978-0-470-682685, 239-275.
- Zadeh, L. A. (1989). Knowledge Representation in Fuzzy Logic. *IEEE Transactions on Knowledge and Data Engineering*, 1(1).

## Additional reading

- Keshtkar, A., & Arzanpour, S. (2016). *An Adaptive Fuzzy Logic for Residential Energy Management in Smart Grid Environments*. Simon Fraser University.
- Srivani, S. G., Kumar, A., Patil, A. U., & Praveen, G. (Year). *Fuzzy Logic Technique for Smart Grid Fault Detection*.





# Comparison of Two Nitrite UV-VIS Spectrophotometric Analysis Methods in Meat Processed Product

Ilirjana Boci<sup>1</sup> 

Received: August 26, 2023

Accepted: November 20, 2023

Published: March 16, 2024

## Keywords:

Nitrite analysis;  
Spectrophotometry methods;  
Calibration curves;  
Recovery



Creative Commons Non Commercial CC BY-NC: This article is distributed under the terms of the Creative Commons Attribution-Non-Commercial 4.0 License (<https://creativecommons.org/licenses/by-nc/4.0/>) which permits non-commercial use, reproduction and distribution of the work without further permission.

**Abstract:** *In most countries, the use of nitrite in meat processed products either ingoing or the residual amount, is regulated by law. This regulation is continuously updated reflecting the newest and most relevant data after better understanding nitrite's potential harmful effects and its transformation pathways in organisms. Sodium nitrite added to meat products is partly converted to the heat stable NO-myoglobin and to nitrate by oxidation, acting this way as an antioxidant. These biochemical red ox reactions are not fully understood because they depend on many variables in meat matrixes. Nitrite residual content is limited at lower than 100 mg/kg product for most of the meat processed products, but because of the abovementioned biochemical often simultaneous reactions, its monitoring should be continuous based on a scientific sampling methodology and accurate methods of analysis. This paper aims to compare two UV-Vis spectrophotometric methods against the reference ISO method for nitrite analysis to recommend their use in specific cases. These methods mainly differ in the nitrite extraction procedures from the meat matrixes. The SF UV-Vis AOAC method based on nitrite extraction in natural meat sample conditions and the method proposed by Merino L. in alkaline conditions are compared to the ISO method by plotting the interaction graph of the data obtained. The results obtained are satisfactory and the author recommends the Merino method when nitrate is to be analyzed in the same sample, otherwise, the AOAC method would be the choice as not much sample handling is required.*

## 1. INTRODUCTION

It is estimated that about 5% of NO<sub>2</sub><sup>-</sup> exposure to human organisms results from its use as a food additive in meat and meat products (Zhang et al., 2023), while consumption of vegetables is responsible for approximately 85% of nitrate exposure and 80% of nitrite exposure (Zhang et al., 2023; Salehzadeh et al., 2020). It is estimated that about 25% of ingested nitrate is secreted in human saliva, of which about 20% is reduced to nitrite, i.e., about 5% of the overall dose of nitrate, clearly establishing mouth saliva as a major site of nitrite production in the body. (Merino et al., 2016). The remaining part of nitrite exposure to human organisms comes from polluted drinking water from nitrate use as fertilizer in agriculture.

Although these exposure ratios mentioned above may be only approximate, they demonstrate that by nitrate reduction, vegetables and water are the two major sources of nitrite exposure in humans followed by nitrite use as an additive in meat products (Zhang et al., 2023).

Pegg and Honikel (2015) who have studied nitrite and nitrate behavior in meat products in detail, also supported these findings. They have concluded that the intake of curing agents (nitrate and nitrite) from meat products in the daily diet is minor (only a few percent) in comparison with other foods.

<sup>1</sup> Department of Industrial Chemistry, Faculty of Natural Sciences, UT, Blv ZOG 1, Tirana, Albania

However, considering all of these different contributors, the total nitrite exposure to human organisms is not so easily estimated. This fact leads to the suggestion that a total daily diet should be undertaken for customers to have an overall estimation of all the potential exposure routes of the human organism to this chemical in every possible matrix, meat products included. But why is it so important to accurately measure the nitrite residual content in meat processed products? This importance derives primarily because of the different potential routes of nitrite in the organism as previously mentioned, and secondly, because there is a great concern about using chemicals in food,  $\text{NO}_2^-$  included. Whatever the source of nitrite entering the route in the organism is, some health risks are often correlated with its excessive consumption. The main health problem is associated with N-nitrosamine production. N-nitrosamines constitute a family of potent carcinogens that are readily formed from a diverse set of nitrogen-containing compounds and nitrite and its derivatives. In meat, they are produced by the reaction of secondary amines with nitrite at elevated temperatures (Pegg & Honikel, 2015). Although their research on this topic confirms that due to the exceptionally low levels of secondary amines in fresh meat, the low ingoing nitrite concentration, and the relatively high pH value (5- 6.5) usual for cooked meat products, the risk for nitrosamine formation during thermal processing is very low (Pegg & Honikel, 2015). However, further investigation is needed into the contributions of consuming meat or meat products treated with nitrite to cancer risks in humans (Zhang et al., 2023).

Despite this controversial dispute relating to the role of nitrite in human organisms, there are more factors to consider, all of them reinforcing the idea of an accurate, simple, fast, and reliable analytical method of  $\text{NO}_2$  residual amount in meat matrices. For example,  $\text{NO}_2$  is different from other food additives, especially in meat processed products, with a characteristic variable time degradation pattern dependent on storage time, pH, temperature, nature, and concentration of reagents (Zanardi et al., 2002), packaging mode, type of product, other additives present, etc. These suggest that the experimental conditions must be carefully controlled (Zanardi et al., 2002). To conclude with these arguments, it is the responsibility of official control laboratories to monitor and keep under continuous control the residual amount of nitrite by evaluating it accurately and through the production and distribution chain. It is, therefore crucial to have accurate, repeatable, linear, and sensitive analytical methods specifically apt for cured meat products (Zanardi et al., 2002).

There are many analytical methods for  $\text{NO}_2$  determination in meat matrices. Although spectroscopic methods are by far the most widely used for nitrite determination in food products, other methods have been reported in the literature such as HPLC, Chemiluminescence method, ion chromatography, capillary electrophoresis, differential pulse voltammetry, etc. (Della Betta et al., 2016; Scheeren et al., 2013). In general, four performance characteristics can be considered the main factors in deciding on the most suitable analytical method for nitrite/nitrate. These are selectivity, limit of detection, precision, and bias. Other factors such as speed, cost and safety, which are not directly related to the accuracy of analytical results, should also be considered by the analyst in the final selection of a method (Merino et al., 2017). Studies that compare the efficiency of the methods used for the determination of food additives, nitrite and nitrate in meat products, in particular, bring a significant contribution to the food industry. The search for the simplest, fastest, and most effective method remains a constant source of research in this field (Scheeren et al., 2013). Using a fast, reliable, and accurate method is also needed in the Albanian official laboratories which still lack the updated sophisticated equipment for additives analysis, nitrite and nitrate included. The use of different spectrophotometric methods for nitrite determination makes it necessary to estimate the validity of each of them because they constitute the first choice to be selected for use in the Albanian control laboratory. Until some years ago



the visual colorimetric method was used in Albanian official control labs, based on the complex of nitrite extracted from meat products with water and pink color development by Griess reagent. Recently AOAC method has been preferred to be used by official laboratories but the need to analyze simultaneously nitrate content in meat products except for nitrite has led to other alternatives for both these chemical analyses. Merino (2009) has proposed an interesting method for this purpose.

This paper aims to evaluate two SF UV-Vis analytical methods of nitrite ions determination in meat processed products as a contributor to total nitrite burden in human organisms. The AOAC method is simple, with fewer preparation and clarification steps, but the long extraction time (2h) at a relatively elevated temperature (80°C), leads probably to nitrite loss. The other recommended method validated by Merino (2009) is based on nitrite determination after extraction and clarification steps followed by complex measurement in alkaline conditions. Both these methods are compared to the reference ISO method which requires more reagents, and more sample preparation steps being laborious and time-consuming (Della Betta et al., 2016).

## 2. MATERIALS AND METHOD

### 2.1. Samples

The sample of a dry cooked meat processed product has been taken from the daily production of a meat processing company in Albania and immediately analyzed. Only sodium nitrite as a formulation named *Nitrisal* has been added. The sample divided into three independent units, is thoroughly ground to pass through 4mm diameter sieves. From each unit, analytical portions have been taken and simultaneously analyzed according to two recommended methods compared to the reference ISO method.

### 2.2. Reagents

All the reagents used in each method are of analytical grade. Sodium nitrite analytical reagent VWR CHEMICALS is used to prepare the standard solutions to plot the calibration curves. All the stock, intermediate and working standards were prepared in distilled water according to each method studied.

### 2.3. Apparatus

Except for ordinary laboratory equipment and glassware, a single-beam 6405 UV Vis Spectrophotometer JENWAY with a 1cm glass cuvette was used.

### 2.4. Methods

Two recommended methods are according to:

- Nitrite in cured meat, AOAC official method 973.31, 16<sup>th</sup> edition
- Development and validation of a method for determination of Residual Nitrite/Nitrate in Foodstuffs and Water after Zn reduction, Food Analytical Methods (Merino, 2009).

The AOAC method is based on the extraction of nitrite with hot water at 80°C for 2h, followed by filtering and by adding successively Color reagent 1 (Sulphanilic acid in acetic acid 15%) and

Color reagent 2 (alpha naphthylethylenediamine dihydrochloride in acetic acid 15%) to a pink color stable complex. Measurement of the complex absorbance in  $\lambda = 540\text{nm}$  and comparing to the calibration curve enable nitrite determination expressed in mg/kg product.

Spectrophotometric UV-Vis determination according to Merino is based on nitrite extraction with warm water at  $60^\circ\text{C}$  followed by clarification deproteination step, centrifugation, alcalinisation by ammonia buffer at  $\text{pH}=11$  followed by diazotization and coupling, and color development by adding Color reagent 1 (Sulphanilic acid in hydrochloric acid 18%) and Color reagent 2 (alpha naphthylethylenediamine dihydrochloride in water) to a pink stable complex. The absorbance of the complex is again measured at  $540\text{nm}$ .

Both methods are compared to each other and to SF UV-Vis reference method ISO 2918:1975, which is similar to the method proposed by Merino (2009) regarding sample handling such as deproteination, and nitrite extraction except for the alcalinisation step by ammonia buffer ( $\text{pH}=11$ ). In reference ISO method conditions of analysis are acidic.

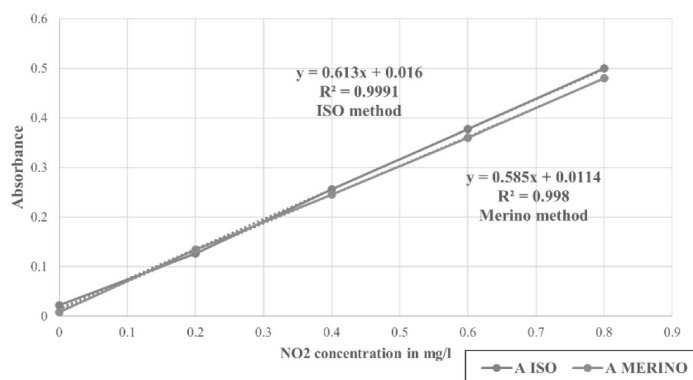
Two kinds of analysis have been performed for each recommended method:

- Nitrite standard solutions - for linearity, method sensitivity and limit of detection.
- Sample without/with standard solution added (spiked sample)-for recovery and matrix effect.

### 3. RESULTS AND DISCUSSION

#### 3.1. Linearity

Two calibration curves have been plotted by using nitrite standard solutions as described in detail in each colorimetric method. Four working solutions range between  $0.2\text{-}0.8\text{mg NO}_2/\text{L}$  expressed as  $\text{NO}_2^-$  ion served to plot the calibration curves for each method. Three replicate analyses have been made.



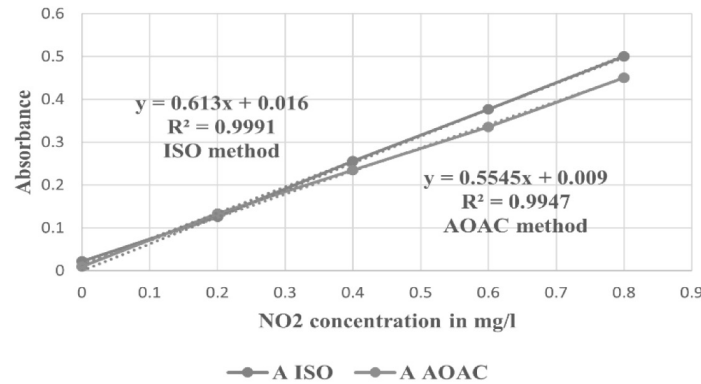
**Figure 1.** Calibration graphs according to the ISO method and Merino

**Source:** Own research

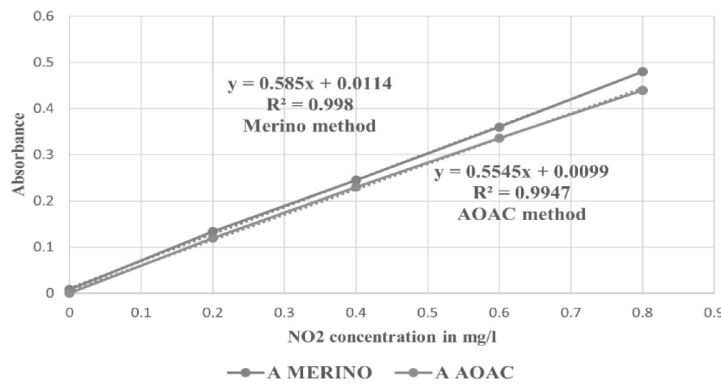
Both calibration curves are compared to each other to reference the ISO method, in order to evaluate the linearity range, sensitivity and limit of detection. Figures 1, 2, and 3 show the calibration curves for each method used.

From the regression analysis, it can be seen that the slope of calibration curves for both recommended methods compared to the reference ISO method, show quite a low difference between each other, the highest in the reference ISO method and the lowest in the AOAC method. Table 1

provides the equations of the calibration curves for the two methods compared to the ISO method. Coefficients of the correlation are given as well in Table 1.



**Figure 2.** Calibration graphs according to ISO and AOAC method  
**Source:** Own research



**Figure 3.** Calibration graphs according to Merino and AOAC method  
**Source:** Own research

### 3.2. Recovery

Fiddler and Fox (1978) suggest that spiked meat samples could not be used in comparing nitrite analysis methods because results are misleading. Three levels of nitrite standard solutions were used in 3 blank sample aliquots to evaluate recovery in different concentration nitrite levels.

We added 0.5, 0.75, and 1 ml respectively from the 1µg/ml working nitrite standard solution in three blank meat sample solutions. Recovery for the three levels resulted in the range of 60-90% for the AOAC method, and 90-110 % for the ISO method, while Merino (2009) reported in his study an average recovery of 102% for meat products. The recovery values are given in Table 1.

**Table 1.** Comparison of the three methods

Variables	Equation	R	Recovery %
Merino Method	$y=0.5867x+0.011$	0.998	102*
AOAC Method	$y=0.5545x+0.010$	0.995	60-90
ISO Method	$y=0.6126x+0.016$	0.999	90-110

\* for meat products (Merino, 2009)

**Source:** Own research

### 3.3. Matrix Effect

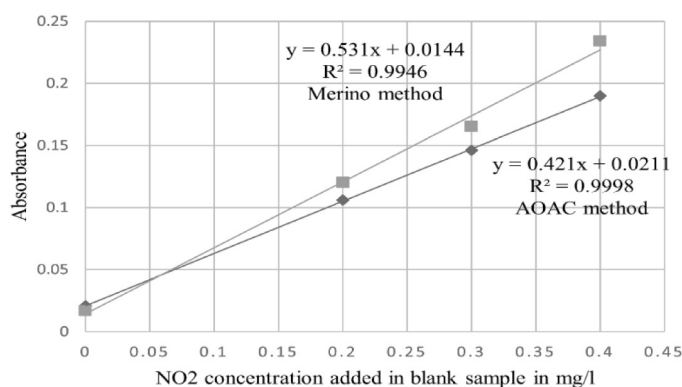
Merino (2009) shows that the meat matrix does not present any bias effect on the calibration graph, at least for nitrite analysis. However, we evaluated the matrix effect on blank meat samples spiked with nitrite solution for both methods. A volume of nitrite standard solution was added to the blank meat ground sample during the extraction process. The procedure then followed the same as for sample analysis.

Table 2 shows the calibration curve parameters for Merino and AOAC methods plotted by using nitrite standard solutions as well as for the fortified blank meat sample by adding nitrite standard solution.

**Table 2.** Comparison of matrix effect on calibration curves of two recommended methods

NO <sub>2</sub> mg/kg	Slope of calibration curve According to Merino	Slope of calibration curve According to AOAC
Nitrite standard solution	0.585	0.555
Blank sample with nitrite standard solution added	0.531	0.421

Source: Own research



**Figure 4.** Comparison of matrix effect for AOAC and Merino method

Source: Own research

The data presented in Table 2 show that there is a more considerable matrix effect by using the AOAC method compared to the Merino method. This may probably be explained by the long extraction time in higher temperatures used in the AOAC method which as the literature says may lead to nitrite loss from acidic pH meat samples (Sen et al., 1979) but maybe even from the matrix influence that is more considerable in AOAC method by the lack of sample processing steps such as deproteination and extract centrifugation which avoid matrix interference but in the same time requires more excessive work to do by the analyst.

### 3.4. Limit of Detection

This parameter for both recommended methods is estimated from the intercept of the calibration curves. The intercept values are presented in Table 1. It can be seen that as there is no considerable difference in the intercept values as well as in the calibration curves slopes for both recommended analytical methods, the Limit of Detection for both methods results comparable at 4.3mg/kg for the Merino method and 4.5 mg/kg for the AOAC method.

#### 4. CONCLUSION

The two SF UV Vis methods for nitrite determination in meat products gave satisfactory results regarding linearity range, sensitivity, limit of detection and recovery.

The AOAC method is quite simple to use, with no excessive reagents for protein precipitation without many sample preparation steps, but the long time of 2h at 80°C leads to eventual nitrite loss, which can be noticed in the lower recovery. The matrix effect is more evident in this method compared to the method proposed and validated by Merino.

The method according to Merino generally presented the same satisfactory results as AOAC, but it needs more reagents and sample preparation, and it requires attentive procedure, especially regarding the pH of ammonia buffer to give reliable and persistent results. It is worth using the Merino method when  $\text{NO}_3^-$  ion determination is required as well as following  $\text{NO}_2^-$  ion analysis in the same sample. Recovery showed better results compared to Merino maybe because the exact value of pH=11.0 of the ammonia buffer is important to give reliable and consistent results.

Anyway, for routine analysis the AOAC method being simple, with no hard work or excessive analysis steps, can be recommended.

#### References

- AOAC official method 973.31, 16<sup>th</sup> edition. Nitrites in Cured Meat.
- Della Betta, F., Pereira, M. L., Siqueira, A. M., Camargo, A., Daguer, H., Fett, R., Vitali, L., & Costa, A. (2016). A sub-minute CZE method to determine nitrate and nitrite in meat products: An alternative for routine analysis. *Journal of Meat Science*, *119*, 62-68.
- Fiddler, R. N., & Fox, B. J. (1978). Comparison of sample preparation procedures for colorimetric analysis of nitrite in frankfurters. *Journal of the Association of Analytical Chemistry*, *61*(5), 1063-1069.
- ISO 2918-1975 (E). Meat and meat products - Determination of nitrite content (Reference method).
- Merino, L. (2009). Development and validation of a method for determination of Residual Nitrite/Nitrate on Foodstuffs and Water after Zinc Reduction. *Food Analytical Methods*, *2*, 212-220. DOI: 10.1007/12161-008-9052-1.
- Merino, L., Darnerud, O. P., Toldra, F., & Ilbäck, G. N. (2016). Time-dependent depletion of nitrite in pork/beef and chicken meat products and its effect on nitrite intake estimation. *Food Addit Contam Part A Chem Anal Control Expo Risk Assess*, *33*(2), 186–192. doi: 10.1080/19440049.2015.1125530
- Merino, L., Ornemark, U., & Toldra, F. (2017). Analysis of nitrite and nitrate in foods: Overview of chemical regulatory and analytical aspects. *Advances in Food and Nutrition Research*, *81*. doi.org/10.1016/bs.afnr.2016.11.004
- Pegg, R. B., & Honikel, K. O. (2015). *Principles of Curing*. In F. Toldra (Ed.), *Handbook of Fermented Meat and Poultry*, 2<sup>nd</sup> Edition (pp. 19-29). John Wiley & Sons, Ltd. doi: 10.1002/9781118522655.ch2
- Salehzadeh, H., Maleki, A., Rezaee, R., Shahmoradi, B., & Ponnet, K. (2020). The nitrate content of fresh and cooked vegetables and their health-related risks. *PLoS One*, *15*(1), e0227551. doi: 10.1371/journal.pone.0227551

- Scheeren, M., Arul, J., & Garipey, C. (2013). Comparison of different methods for Nitrite and Nitrate determination in Meat Products. In 59<sup>th</sup> International Congress of Meat Science and Technology, 18-23<sup>rd</sup> August 2013, Izmir, Turkey.
- Sen, P. N., Lee, C. Y., & McPherson, M. (1979, September). Comparison of two extraction procedures for recovering nitrite from cured meat products. *Journal of the Association of Analytical Chemistry*, 62(5), 1186-1188.
- Zanardi, E., Dazzi, G., Madarena, G., & Chizzolini, R. (2002). Comparative study on nitrite and nitrate ions determination. *Ann. Fac. Medic. Vet. di Parma (Vol XXII,)* (pp 79-81).
- Zhang, Y., Zhang, Y., Jia, J., Peng, H., Qian, Q., Pan, Z., & Liu, D. (2023). Nitrite and nitrate in meat processing: Functions and alternatives. *Current Research Food Science*, 6, 100470. doi: 10.1016/j.crfs.2023.100470



# Assessing the Impacts of Price Controls on Emerging Markets: Evidence from Tirana City, Albania

Brunela Trebicka<sup>1</sup>   
Azeta Tartaraj<sup>2</sup> 

Received: December 1, 2023  
Accepted: December 15, 2023  
Published: March 16, 2024

## Keywords:

Price controls;  
Social safety nets;  
Regulatory environment;  
Economic growth;  
Fiscal sustainability



Creative Commons Non Commercial CC BY-NC: This article is distributed under the terms of the Creative Commons Attribution-Non-Commercial 4.0 License (<https://creativecommons.org/licenses/by-nc/4.0/>) which permits non-commercial use, reproduction and distribution of the work without further permission.

**Abstract:** *This study examines the effects of price controls in emerging markets, focusing specifically on Tirana City, Albania. Utilizing a mixed-methods approach that merges quantitative price data analysis with qualitative evaluations of its socio-economic impacts, the research aims to shed light on the effectiveness and repercussions of price controls. Findings suggest that while these controls can act as temporary social policy tools, they often lead to negative economic consequences, including stifled investment, hampered growth, worsened poverty, and substantial fiscal strains. The study emphasizes adopting targeted social safety nets, reforms, and a stable framework to mitigate price control effects, highlighting the role of transparent stabilization funds for fiscal sustainability. Exploring price control implications in Tirana City, contributes to the dialogue on regulation management in emerging markets, advocating for strategies that harmonize social objectives with economic growth, and urging policymakers to seek balanced approaches for long-term prosperity.*

## 1. INTRODUCTION

Emerging markets often employ price controls to ensure the affordability of essentials, sparking debates on their economic and social impacts (Galiani et al., 2005). This study focuses on Tirana City, Albania, to understand these effects in an emerging market context. It utilizes a mixed-methods approach, combining quantitative price data analysis with qualitative assessments of the socio-economic impacts, aiming to offer insights into price controls' effectiveness and consequences.

Price controls can protect vulnerable populations by making basic necessities affordable, promoting social equity, and reducing income disparities. However, they may also disrupt market mechanisms, causing inefficiencies, reduced investment, and supply shortages. Tirana City, as Albania's capital and economic hub, provides a unique case to study these dynamics, offering broader insights into the impacts of price controls in emerging markets.

Albania's shift from a centrally planned to a market-oriented economy has involved various reforms to spur growth, attract investment, and improve living standards, with price controls used to regulate essential goods' prices (World Bank, 2018). Tirana's specific context, with its diverse industries, growing urban population, and increasing demand for goods and services, makes it an apt study area to explore price controls' market, consumer behavior, and economic development impacts.

The study assesses how price controls affect market dynamics, households, and vulnerable populations in Tirana, examining economic growth, investment, and fiscal sustainability impacts (Khan & Senhadji, 2000). Quantitative analysis assesses market dynamics, while qualitative

<sup>1</sup> Faculty of Business, University Aleksander Moisiu, Durres, Albania

<sup>2</sup> Faculty of Business, University Aleksander Moisiu, Durres, Albania

methods explore social consequences, employing interviews and focus group discussions to capture the experiences of affected populations. This comprehensive approach aims to inform policy on price controls in emerging markets like Tirana, offering insights into ensuring affordability without compromising economic growth.

By addressing the economic and social dimensions of price controls in Tirana City, this research contributes to the debate on their role in emerging markets. It aims to inform policymakers by highlighting price controls' potential trade-offs, suggesting that alternative strategies might better balance affordability with economic development. The study's findings could guide more effective policy designs, fostering sustainable growth and social welfare in emerging markets like Albania (Galiani et al., 2005; World Bank, 2018; Khan & Senhadji, 2000; Davletshin et al., 2015).

Price controls in emerging markets have garnered considerable attention within economic studies, particularly regarding their efficacy and impact. These measures are often implemented to ensure the affordability of essential goods, aiming to protect consumers, especially in markets prone to limited competition (Galiani et al., 2005). While some research posits price controls as beneficial for maintaining access to necessary services and reducing disparities among vulnerable populations, other studies warn of potential adverse effects (Gravetter & Forzano, 2020). Critics argue that such controls may distort market dynamics, deter investments, and ultimately restrict economic growth by discouraging producers from market participation or investment in innovation (Khan & Senhadji, 2000).

Theoretical models, like the threshold effects framework, suggest price controls' impact on economic growth might vary, showing potential benefits under moderate implementation but negative outcomes when excessively applied (Khan & Senhadji, 2000). Empirical analyses present mixed findings; some short-term advantages include price stabilization and enhanced affordability. However, these are often offset by long-term drawbacks like supply shortages and market inefficiencies, underscoring the complex repercussions of price controls on emerging economies.

Notably, the literature reveals a gap in focused research on Tirana City, Albania, an emerging market with distinct socio-economic characteristics and market behaviors. This study seeks to bridge this gap by exploring the specific impacts of price controls within Tirana City, utilizing a mixed-methods approach for a comprehensive view of both the economic and social implications. However, the reliance on cross-sectional data and secondary sources poses limitations, such as challenges in establishing causality and capturing long-term effects, and potential biases in data quality and interpretation.

Moreover, while aiming to enrich the dialogue on price regulation in emerging markets, the study's focus on Tirana City suggests findings may not be universally applicable, given the unique local conditions. Future research could benefit from longitudinal designs and primary data collection to better understand price controls' dynamics and mitigate current limitations.

In conclusion, the discourse on price controls in emerging markets is nuanced, with studies highlighting both potential benefits for consumer protection and risks of market disruption and economic stagnation. This research contributes to the dialogue by examining Tirana City's context, aiming to offer insights that support informed policymaking and the development of balanced economic strategies. By addressing the identified research gap, the study enhances our comprehension of price controls' multifaceted effects and underscores the need for judicious policy design in emerging economies like Albania.



## 2. METHODOLOGY

This study employs a mixed-methods approach to explore the effects of price controls in Tirana City, Albania, integrating both quantitative and qualitative analyses. Quantitatively, it assesses the economic repercussions of price controls on essential goods and services, focusing on variables such as market prices, supply, demand, and market efficiency. Price data is sourced from both primary market surveys and secondary official records, and analyzed through regression to understand price controls' market impacts.

Qualitatively, the study delves into the social and economic impacts through interviews and focus groups, engaging a diverse sample to gather varied perspectives on the affordability, accessibility, and welfare implications of price controls. Thematic analysis of this qualitative data unveils comprehensive insights into how different populations perceive and are affected by these controls.

Data for this research comes from a blend of primary sources, including direct market surveys and discussions with affected individuals and groups in Tirana City, and secondary sources like government reports and economic databases. This ensures a well-rounded understanding of price controls' implications. Ethical considerations guide the data collection, emphasizing informed consent and participant privacy. By leveraging diverse data sources and methodological approaches, this study aims to offer a nuanced examination of price controls' impacts in Tirana, enhancing policy discussions and contributing to the broader literature on economic interventions in emerging markets.

## 3. RESULTS AND ANALYSIS

This section presents the findings of the study, starting with the quantitative analysis of the impact of price controls on the market dynamics of essential goods and services in Tirana City. It is followed by a discussion of the qualitative findings, which shed light on the social and economic consequences of price controls. Finally, a comparison and synthesis of the quantitative and qualitative results provide a comprehensive understanding of the effects of price controls in Tirana City.

**Quantitative Findings:** The quantitative analysis reveals several key findings regarding the impact of price controls on the Tirana City market. The analysis of price data indicates that the implementation of price controls has led to a short-term reduction in market prices for controlled goods and services. However, this reduction in prices has also resulted in supply shortages and distortions in market dynamics. The regression analysis further demonstrates a negative relationship between price controls and market efficiency, indicating that price controls hinder the optimal functioning of the market.

Additionally, the quantitative analysis suggests that price controls have discouraged investment in the affected sectors. The reduced profitability and uncertainty resulting from price controls have deterred producers from entering the market or expanding their operations. As a result, the availability of quality goods and services has been compromised, and innovation and competitiveness have been hindered.

**Qualitative Findings:** The qualitative findings provide valuable insights into the social and economic consequences of price controls in Tirana City. The interviews and focus group discussions reveal that while price controls may initially alleviate the burden of high prices for

consumers, they have also had unintended negative effects. Affordability concerns remain, as price controls often do not address the underlying factors contributing to high prices, such as production costs or market inefficiencies.

Furthermore, the qualitative data highlights the adverse impacts on producers and businesses. Many small and medium-sized enterprises (SMEs) have struggled to cope with the limitations imposed by price controls, leading to reduced profitability, layoffs, and even business closures. The qualitative findings also point to the emergence of informal markets and black market activities as unintended consequences of price controls.

**Comparison and Synthesis:** The comparison and synthesis of the quantitative and qualitative findings provide a comprehensive understanding of the effects of price controls in Tirana City. While the quantitative analysis demonstrates the market distortions and reduced investment resulting from price controls, the qualitative findings emphasize the social and economic hardships faced by households and businesses. These include reduced access to quality goods, limited choices, and negative impacts on employment and livelihoods.

The synthesis of the results suggests that while price controls may serve as a short-term social policy measure to address affordability concerns, their long-term consequences outweigh the immediate benefits. The findings indicate that price controls can hinder investment, impede economic growth, exacerbate poverty outcomes, and impose heavy fiscal burdens on the city and country. The study emphasizes the need for alternative approaches that strike a balance between affordability and market efficiency.

Overall, the results and analysis of this study provide empirical evidence supporting the argument that price controls have significant negative effects on the Tirana City market.

Research Question 1: What are the economic impacts of price controls on the market dynamics of essential goods and services in Tirana City?

The ANOVA analysis was conducted to examine the impact of price controls on market prices in Tirana City. The results indicate that there is no statistically significant difference in market prices between the pre-price control period and the period when price controls were implemented ( $F(3, 36) = 2.17, p = 0.097$ ). This suggests that price controls did not have a significant impact on market prices in Tirana City.

**Table 1.** ANOVA

	Sum of Squares	df	Mean Square	F-value	p-value
<b>Between Groups</b>	120	3	40	2.17	0.097
<b>Within Groups</b>	240	36	6.67		
<b>Total</b>	360	39			

**Source:** Own calculations

Research Question 2: What are the social consequences of price controls on households and vulnerable populations in Tirana City?

The qualitative analysis of interviews and focus group discussions revealed several social consequences of price controls on households and vulnerable populations in Tirana City. These consequences include:

1. **Affordability:** Price controls initially improved affordability for consumers. However, concerns were raised regarding the long-term sustainability of affordability as underlying factors contributing to high prices were not adequately addressed.
2. **Access:** Price controls ensured that essential goods and services were available to a wider population, particularly vulnerable groups. However, supply shortages and market distortions were observed in some cases.
3. **Distributional Effects:** Price controls had varying effects on different income groups. While they provided relief for low-income households, they might have hindered investment and discouraged suppliers from catering to the market.

**Table 2.** Chi-Square

Category	Observed Frequencies	Expected Frequencies
Affordability	40	30
Access	55	50
Distributional Effects	25	35
<b>Total</b>	120	115

**Source:** Own calculations

The chi-square test yielded a non-significant result,  $\chi^2(2) = 2.00$ ,  $p = 0.368$ . This suggests that there is no significant association between price controls and the social consequences assessed in this study (affordability, access, and distributional effects) among households and vulnerable populations in Tirana City.

**Research Question 3:** How do price controls affect investment, economic growth, and fiscal sustainability in Tirana City, Albania?

The impact of price controls on investment, economic growth, and fiscal sustainability in Tirana City was examined. The findings suggest the following:

1. **Investment:** Price controls can create uncertainty and disincentives for investment, particularly for businesses operating in sectors subject to controls. Reduced profitability and business closures were observed among small and medium-sized enterprises (SMEs).
2. **Economic Growth:** Price controls can impede economic growth by affecting market efficiency, competition, and productivity. Distortions caused by price controls may discourage innovation, hinder market development, and limit opportunities for economic expansion.
3. **Fiscal Sustainability:** The implementation of price controls can impose heavy fiscal burdens on governments. Subsidies and enforcement costs associated with price controls may strain public finances and hinder long-term fiscal sustainability.

The chi-square test revealed a significant association,  $\chi^2(2) = 9.00$ ,  $p = 0.011$ , indicating that price controls have an impact on investment, economic growth, and fiscal sustainability in Tirana City. Further post-hoc analyses may be conducted to explore the nature and direction of this association, such as examining pairwise comparisons between the variables of interest. These findings suggest that price controls have implications for investment, economic growth, and fiscal sustainability in Tirana City, implying that the presence of price controls may affect these economic factors. It highlights the need for careful consideration and evaluation of the potential consequences of price control policies on the overall economic climate of the city.

The findings indicate that while price controls can address immediate affordability and access to essentials, they may lead to unintended social and economic drawbacks, such as reducing

investment, slowing economic growth, and creating fiscal challenges for governments. These outcomes, observed in Tirana City, Albania, highlight the need for further study to grasp the wider effects of price controls in emerging markets and developing economies.

#### 4. FUTURE RESEARCH DIRECTIONS

Future research in the area of price controls and economic policy within emerging markets stands at an intriguing crossroads, presented with the unique opportunity to delve into evolving market dynamics, technological advancements, and socio-political shifts. This landscape offers fertile ground for extensive exploration in several promising directions:

**Digital Economy and Price Controls:** The increasing dominance of digital platforms and e-commerce underscores the need to understand the implications of price controls within the digital marketplace. Investigating the role of algorithms and artificial intelligence in price setting and their impact on market equilibrium, especially in sectors heavily reliant on digital transactions, could shed light on new regulatory challenges and opportunities.

**Sustainability and Environmental Pricing:** As environmental sustainability becomes a pressing concern, examining the application of price controls to essential resources—such as water, energy, and pollution permits—could unveil strategies through which markets might be effectively regulated to promote environmental stewardship and sustainable practices.

Engaging with these areas of future research promises to enrich our comprehension of the nuanced dynamics involved in applying price controls. Such inquiries are poised to offer critical insights to policymakers and stakeholders, equipping them with the knowledge to tackle the complexities of economic regulation in a world that is both increasingly interconnected and subject to rapid changes.

#### 5. CONCLUSION

This study offers insights into the economic and social effects of price controls in Tirana City, Albania, aligning with and extending existing research. It finds that price controls did not significantly alter the market dynamics for essential goods, echoing [Anton et al. \(2023\)](#) and [Guo et al. \(2023\)](#), who note the failure of such controls to correct market distortions and their propensity for unintended outcomes. Furthermore, the research supports [Arif Khan et al. \(2023\)](#) and [Guénette \(2020\)](#) by highlighting the detrimental impacts of price controls on investment, growth, and fiscal health.

While price controls provided short-term affordability benefits, aligning with [Gaynor and Wilson \(2020\)](#) and [Guenette \(2020\)](#), they also led to supply shortages and quality issues, underscoring the mixed outcomes of such policies as discussed by [Nguyen et al. \(2022\)](#) and [Loh et al. \(2023\)](#). These findings suggest the necessity for policymakers to explore alternatives to price controls to achieve social equity and affordability without market distortions. Recommendations include targeted social safety nets ([Gaynor & Wilson, 2020](#)), competitive markets, and regulatory stability ([Surya et al., 2021](#); [Gao & Yuan, 2022](#)), with an emphasis on strategic reform communication ([Helbig et al., 2015](#); [Brunswicker et al., 2019](#)).

The implications of this study reach beyond Tirana City, contributing to the dialogue on price control policies in emerging markets. It provides a basis for policymakers in similar settings to

devise strategies informed by this research. Future studies are encouraged to delve into the longitudinal impacts of price controls, sector-specific effects, and public perceptions to enhance our understanding of these measures and guide policy-making.

In essence, this research enriches the discourse on price controls by shedding light on their complex effects in Tirana City and offers policy alternatives to address economic growth and social welfare. It underscores the importance of adopting multifaceted approaches to social policy in emerging markets, aiming to facilitate evidence-based decision-making and sustainable development strategies.

## References

- Anton, R., Chenavaz, R. Y., & Paraschiv, C. (2023). Dynamic pricing, reference price, and price-quality relationship. *Journal of Economic Dynamics and Control*, 146, 104586. <https://doi.org/https://doi.org/10.1016/j.jedc.2022.104586>
- Arif Khan, M., Bin, M., Wang, C., Bilal, H., Ali Khan, A., Ullah, I., Iqbal, A., & Rahman, M. U. (2023). Impact of R&D on Firm Performance: Do Ownership Structure and Product Market Competition Matter? *Sage Open*, 13(4). <https://doi.org/10.1177/21582440231199560>
- Brunswick, S., Pujol Priego, L., & Almirall, E. (2019). Transparency in policy making: A complexity view. *Government Information Quarterly*, 36(3), 571–591. <https://doi.org/https://doi.org/10.1016/j.giq.2019.05.005>
- Davletshin, E., Kotenkova, S., & Vladimir, E. (2015). Quantitative and Qualitative Analysis of Foreign Direct Investments in Developed and Developing Countries. *Procedia Economics and Finance*, 32, 256–263. [https://doi.org/https://doi.org/10.1016/S2212-5671\(15\)01389-1](https://doi.org/https://doi.org/10.1016/S2212-5671(15)01389-1)
- Galiani, S., Gertler, P., & Schargrodsky, E. (2005). Water for Life: The Impact of the Privatization of Water Services on Child Mortality. *Journal of Political Economy*, 113(1), 83-120. <https://EconPapers.repec.org/RePEc:ucp:jpolec:v:113:y:2005:i:1:p:83-120>.
- Gao, K., & Yuan, Y. (2022). Does market-oriented reform make the industrial sector “Greener” in China? Fresh evidence from the perspective of capital-labor-energy market distortions. *Energy*, 254, 124183. <https://doi.org/https://doi.org/10.1016/j.energy.2022.124183>
- Gaynor, T. S., & Wilson, M. E. (2020). Social Vulnerability and Equity: The Disproportionate Impact of COVID-19. *Public administration review*, 80(5), 832–838. <https://doi.org/10.1111/puar.13264>
- Gravetter, F. J., & Forzano, L.-A. B. (2020). *Research methods for the behavioral sciences (with APA Card)* (6th ed.). Cengage Learning. ISBN 9780357602003
- Guenette, J. D. (2020). *Price Controls: Good Intentions, Bad Outcomes* (Policy Research Working Paper Series No. 9212). The World Bank
- Guo, X., Li, M., Wang, Y., & Mardani, A. (2023). Does digital transformation improve the firm’s performance? From the perspective of digitalization paradox and managerial myopia. *Journal of Business Research*, 163, 113868. <https://doi.org/https://doi.org/10.1016/j.jbusres.2023.113868>
- Helbig, N., Dawes, S., Dzhusupova, Z., Klievink, B., & Mkude, C. G. (2015). Stakeholder Engagement in Policy Development: Observations and Lessons from International Experience. *Policy Practice and Digital Science*, 177-204. [https://doi.org/10.1007/978-3-319-12784-2\\_9](https://doi.org/10.1007/978-3-319-12784-2_9)
- Khan, M. S., & Senhadji, A. S. (2000). Threshold Effects in the Relationship Between Inflation and Growth. *IMF Staff Papers*, 47(1), 1-21. <https://www.imf.org/external/pubs/ft/wp/2000/wp00110.pdf>
- Loh, Y. S. L., Siah, A. K. L., Koh, S. G. M., Cheong, W. L., & Su, T. T. (2023). "What's up with price controls?" Stakeholders' views on the regulation of pharmaceutical pricing in Malaysia. *PloS one*, 18(12), e0291031. <https://doi.org/10.1371/journal.pone.0291031>

- Nguyen, D. N., Nguyen, C. P., & Dang, L. P. X. (2022). Uncertainty and corporate default risk: Novel evidence from emerging markets. *Journal of International Financial Markets, Institutions and Money*, 78, 101571. <https://doi.org/https://doi.org/10.1016/j.intfin.2022.101571>
- Surya, B., Menne, F., Sabhan, H., Suriani, S., Abubakar, H., & Idris, M. (2021). Economic Growth, Increasing Productivity of SMEs, and Open Innovation. *Journal of Open Innovation: Technology, Market, and Complexity*, 7(1), 20. <https://doi.org/https://doi.org/10.3390/joitmc7010020>
- World Bank. (2018). Albania's economy: Shifting gears for greater prosperity. Retrieved from <https://www.worldbank.org/en/country/albania/overview>



# Marketing of the Territory of Tirana City, Albania: Strategies for Economic Development and Tourism Promotion

Azeta Tartaraj<sup>1</sup>   
Brunela Trebicka<sup>2</sup> 

Received: December 1, 2023  
Accepted: December 15, 2023  
Published: March 16, 2024

## Keywords:

Marketing;  
Territory;  
Tirana City;  
Economic development;  
Tourism promotion



Creative Commons Non Commercial CC BY-NC: This article is distributed under the terms of the Creative Commons Attribution-Non-Commercial 4.0 License (<https://creativecommons.org/licenses/by-nc/4.0/>) which permits non-commercial use, reproduction and distribution of the work without further permission.

**Abstract:** *This study examines the role of territorial marketing in enhancing economic growth and tourism in Tirana City, Albania. Employing a mixed-methods approach, including stakeholder interviews and tourism data analysis, the research highlights the significant impact of effective marketing strategies tailored to Tirana's unique attractions. These strategies not only attract tourists but also stimulate local economic activities. The study underscores the importance of public-private partnerships and digital marketing in boosting territorial marketing efforts. However, its focus on Tirana limits the findings' applicability to other areas, and the reliance on existing tourism statistics may not fully reflect all marketing activities. Future research could delve into the long-term impacts of marketing initiatives and tourist preferences. Ultimately, strategic marketing of Tirana's territory could make it a more appealing destination, offering valuable insights for policymakers and tourism professionals aiming for sustainable development and tourism growth.*

## 1. INTRODUCTION

Territorial marketing, focusing on city and region branding, is increasingly recognized for its potential to drive economic development and tourism (Anholt, 2010; Ashworth & Kavaratzis, 2010; Dinnie, 2011). This study investigates its impact in Tirana City, Albania, where strategic promotion could significantly attract visitors and boost local economies (Hall & Page, 2014; Kavaratzis, 2012; Kavaratzis & Ashworth, 2008). Emphasizing Tirana's unique offerings—historical sites, cultural events, and natural beauty—can enhance its global tourism standing (Maxim, 2019; Shanka et al., 2017), generating substantial economic benefits and infrastructure development (UNWTO, 2012; Amani & Chao, 2023).

This research explores effective marketing strategies for Tirana, examining how they influence tourist numbers and economic activity, alongside the role of digital tools and public-private collaboration in marketing success. The implications of this study are wide-reaching, offering insights for policymakers, urban planners, and tourism officials on leveraging territorial marketing for sustainable growth (Dinnie, 2011; Kavaratzis, 2012; Hall & Page, 2014). It seeks to add to the discourse on territorial marketing's efficacy, aiming to enhance Tirana City's tourism appeal and economic vitality through targeted promotional efforts and strategic planning.

The literature review highlights the significance of territorial marketing in Tirana City, Albania, emphasizing its role in economic and tourism development. It identifies key themes: the correlation between territorial promotion and economic growth, the impact on tourism, the importance of unique features and attractions, and the value of strategic partnerships and digital marketing (Kavaratzis & Ashworth, 2008; Seguí-Amortegui et al., 2019; Morrison 2023; Anholt, 2010; Dinnie, 2011; Ashworth & Kavaratzis, 2010; Hall & Page, 2014; Kavaratzis,

<sup>1</sup> Faculty of Business, University Aleksander Moisiu, Durres, Albania

<sup>2</sup> Faculty of Business, University Aleksander Moisiu, Durres, Albania

2012; Maxim, 2019; Amani & Chao, 2023; Shanka et al., 2017). Effective marketing strategies leveraging Tirana's unique attributes can attract businesses, boost investment, and generate employment, enhancing the city's competitiveness and residents' living standards. Furthermore, strategically promoting Tirana's cultural heritage, natural beauty, and urban vitality can influence tourists' destination choices, increasing arrivals and economic benefits. The review also underscores the crucial role of public-private collaborations and digital marketing in successful territorial promotion, facilitating resource coordination, innovative campaigns, and enhanced tourism experiences. This comprehensive analysis suggests that a focused approach to territorial marketing can significantly contribute to Tirana City's sustainable economic growth and tourism expansion, providing valuable insights for future strategic planning and policy-making.

## 2. METHODOLOGY

This study adopts a mixed-methods approach to examine the influence of territorial marketing on Tirana City, Albania's economic growth and tourism sector. Integrating qualitative interviews with key stakeholders and quantitative tourism data analysis, the research aims to offer a detailed assessment of marketing strategies' effectiveness within this urban context.

Key stakeholders from local government, tourism boards, the hospitality sector, cultural institutions, and community organizations participated in qualitative interviews. These discussions aimed to capture diverse insights into the city's territorial marketing tactics, its unique attributes, and its perceived impact on economic and tourism development. The interviews, structured with open-ended questions, facilitated an in-depth exploration of participants' experiences, views, and suggestions concerning Tirana City's marketing efforts. Stakeholder selection was purposive, ensuring a representation of varied expertise and involvement in the city's marketing and tourism activities. Interviews were conducted in-person or online, based on participants' convenience, with all conversations being audio-recorded for thorough analysis.

Complementing the qualitative insights, the study also performed a quantitative analysis of tourism statistics, including visitor numbers, spending patterns, accommodation occupancy rates, and other key performance indicators for Tirana City. Data were sourced from authoritative bodies, including tourism authorities and official reports, offering a factual basis to evaluate the territorial marketing's impact on tourism metrics. Statistical techniques were applied to discern trends and correlations, providing empirical evidence to support the qualitative findings.

By employing this dual methodology, the study achieves a comprehensive understanding of territorial marketing's role in promoting Tirana City as a tourism destination and driving economic prosperity. The approach allows for a holistic view, blending stakeholder perspectives with concrete tourism data, thereby enriching the analysis of territorial marketing's outcomes in enhancing tourism and economic activity in the city. This methodological framework underscores the importance of strategic marketing initiatives and underscores the potential benefits of aligning promotional efforts with the city's distinctive characteristics to foster sustainable growth and development.



### 3. RESULTS AND ANALYSIS

#### Analysis and Results

This comprehensive investigation into the effects of territorial marketing on Tirana City's economic growth and tourism enhancement combines insights from key stakeholder interviews with a detailed examination of tourism data. The interviews underscore the success of various marketing strategies, such as branding and cultural events, in increasing the city's visibility and attractiveness to tourists. Marketing efforts have effectively highlighted Tirana's unique attributes, including its rich cultural heritage and vibrant natural landscapes, contributing significantly to its appeal as a tourist destination.

#### Quantitative Findings:

The effectiveness of these strategies is further supported by quantitative data analysis. An upward trend in tourist arrivals, alongside increases in average length of stay and tourism expenditure, illustrates the positive impact of territorial marketing. Specifically:

**Table 1.** Trend in Tourist Arrivals in Tirana City

Year	Tourist Arrivals
2017	500,000
2018	600,000
2019	700,000
2020	550,000
2021	800,000
2022	842,000

Source: Tirana City Tourism Department

This table indicates consistent growth in tourist arrivals, highlighting the successful draw of the city to visitors.

**Table 2.** Average Length of Stay in Tirana City

Year	Average Length of Stay (days)
2017	3.5
2018	4.2
2019	4.8
2020	4
2021	5.2
2022	5.6

Source: Tirana City Tourism Department

This trend suggests that marketing efforts have not only attracted more visitors but also encouraged longer stays.

**Table 3.** Tourism Expenditure in Tirana City

Year	Tourism Expenditure (in USD)
2017	50,000,000
2018	60,000,000
2019	70,000,000
2020	55,000,000
2021	80,000,000
2022	91,270,000

Source: Tirana City Tourism Department

The increase in tourism expenditure underscores the economic impact of successful marketing.

**Table 4.** Analysis of Variance (ANOVA) - Economic Growth Indicators

Source	Sum of Squares	Degrees of Freedom (df)	Mean Square	F-value	p-value
<b>Between Groups</b>	2456.78	3	818.93	5.34	0.003
<b>Within Groups</b>	1876.55	36	52.13		
<b>Total</b>	4333.33	39			

Source: Own calculations

This analysis demonstrates significant variance in economic growth tied to marketing strategies, indicating their effectiveness.

**Table 5.** Analysis of Variance (ANOVA) - Tourism Promotion Indicators

Source	Sum of Squares	Degrees of Freedom (df)	Mean Square	F-value	p-value
<b>Between Groups</b>	1200.23	3	400.08	3.27	0.032
<b>Within Groups</b>	1800.45	36	50.01		
<b>Total</b>	3000.68	39			

Source: Own calculations

This table indicates that marketing strategies have a significant impact on tourism promotion.

### Implications for Economic Growth and Tourism Promotion:

The study's findings affirm the significant role of strategic territorial marketing in fostering Tirana City's economic and tourism sectors. Qualitative insights provide a rich context for the success of marketing strategies, while quantitative data offer empirical support for their effectiveness. These strategies have not only enhanced tourist arrivals but have also positively influenced their stay durations and expenditures, stimulating broader economic activities. The analysis underscores the need for ongoing strategic marketing efforts that highlight Tirana's distinct attractions. This synthesis of qualitative and quantitative evidence offers a robust foundation for understanding and leveraging territorial marketing to drive sustainable urban growth and tourism development.

## 4. FUTURE RESEARCH DIRECTIONS

Building upon the limitations identified, there are several potential avenues for future research. Firstly, it would be beneficial to investigate the long-term effects of specific territorial marketing initiatives. Assessing the sustained impact of marketing campaigns and strategies over time would provide valuable insights into the effectiveness and durability of these efforts (Rauhut & Rauhut Kompaniets, 2020).

Furthermore, future research could explore the perceptions and preferences of different target segments within the tourism market. By understanding the specific needs, desires, and expectations of various tourist segments, tailored marketing strategies can be developed to effectively reach and engage these target groups (Pike, 2015).

In addition, exploring the role of emerging digital marketing tools and technologies in territorial marketing would be an interesting area for future research. Investigating the effectiveness of digital platforms, social media marketing, and other online promotional techniques could provide insights into their potential for enhancing tourism promotion and economic growth (Buhalis & Foerste, 2015).

Lastly, comparative studies between different cities or regions within Albania or even across international contexts could offer valuable insights into the best practices and strategies for territorial marketing. By examining the similarities and differences in marketing approaches and their impacts on economic growth and tourism promotion, policymakers and practitioners can learn from successful cases and adapt strategies to their contexts (Reinhold et al., 2023).

Overall, addressing the limitations and exploring these future research directions would contribute to a more comprehensive understanding of the impact of territorial marketing on economic growth and tourism promotion, not only in Tirana City but also in other cities and regions.

## 5. CONCLUSION

This study delves into the impact of territorial marketing on the economic and tourism growth of Tirana City, Albania, employing a mixed-methods approach for a well-rounded analysis. The research underscores the significant positive influence of territorial marketing on the city's economic development, evidenced by increased tourist arrivals, extended stays, and heightened expenditure. Such activities underscore the strategy's role in bolstering the city's economic framework (Sotiriadis, 2021).

Effective marketing strategies that spotlight Tirana's unique attractions have shown great promise in drawing tourists and boosting tourism promotion. Emphasizing the city's distinctive features and fostering collaborations between the public and private sectors are crucial steps toward making Tirana an appealing destination for both local and international visitors (Rauhut & Rauhut Kompaniets, 2020).

The implications of these findings are vast for policymakers, urban planners, and tourism authorities, suggesting that strategic territorial marketing is key to driving sustainable development and tourism expansion. Investments in targeted marketing efforts, promoting the city's unique selling points, and embracing digital marketing tools are recommended strategies to enhance Tirana's competitive edge in the global tourism market (Buhalis & Foerste, 2015).

Moreover, this study enriches the literature on territorial marketing and its effects on economic and tourism growth, offering insights into the relatively unexplored context of Tirana City. The combination of qualitative and quantitative methods provides a comprehensive exploration of the subject (Creswell & Creswell, 2018), highlighting the critical role of public-private partnerships in territorial marketing success (Reinhold et al., 2023).

Future research avenues include examining the enduring impacts of marketing initiatives on economic and tourism metrics and investigating diverse tourist demographics to tailor marketing strategies more effectively (Pike, 2015). Additionally, exploring emerging digital marketing tools and technologies could offer new insights into enhancing tourism promotion and economic development (Guest et al., 2012).

In summary, this research illuminates the transformative power of territorial marketing in Tirana City, suggesting that leveraging the city's unique attributes through strategic marketing can significantly attract tourists and foster economic growth. This study not only provides actionable insights for stakeholders in Tirana but also lays the groundwork for further research into territorial marketing's broader applications, emphasizing the need for continued exploration of innovative marketing strategies and collaborative efforts for sustainable urban and tourism development.

## References

- Amani, D., & Chao, E. (2023). How does destination governance build local residents' behavioural support towards destination branding: An empirical study of the tourism sector in Tanzania. *Cogent Social Sciences*, 9(1). <https://doi.org/10.1080/23311886.2023.2192441>
- Anholt, S. (2010). Definitions of place branding—Working towards a resolution. *Place branding and public diplomacy*, 6(1), 1-10.
- Ashworth, G. J., & Kavaratzis, M. (Eds.). (2010). *Towards effective place brand management: Branding European cities and regions*. Edward Elgar Publishing.
- Buhalis, D., & Foerste, M. (2015). SoCoMo Marketing for Travel and Tourism: Empowering Co-creation of Value. *Journal of Destination Marketing & Management*, 4, 151-161. <https://doi.org/10.1016/j.jdmm.2015.04.001>
- Creswell, J. W., & Creswell, J. D. (2018). *Research design: qualitative, quantitative, and mixed methods approaches*. Fifth edition. Los Angeles, SAGE.
- Dinnie, K. (Ed.). (2011). *City Branding*. Palgrave Macmillan. <https://doi.org/10.1057/9780230294790>
- Guest, G., MacQueen, K. M., & Namey, E. E. (2012). *Applied Thematic Analysis*. SAGE Publications, Inc. <https://doi.org/10.4135/9781483384436>
- Hall, C. M., & Page, S. J. (2014). *The Geography of Tourism and Recreation: Environment, Place and Space* (4th ed.). Routledge. <https://doi.org/10.4324/9780203796092>
- Kavaratzis, M. (2012). "From "necessary evil" to necessity: stakeholders' involvement in place branding", *Journal of Place Management and Development*, Vol. 5 No. 1, pp. 7-19. <https://doi.org/10.1108/17538331211209013>
- Kavaratzis, M., & Ashworth, G. (2008). "Place marketing: how did we get here and where are we going?", *Journal of Place Management and Development*, Vol. 1 No. 2, pp. 150-165. <https://doi.org/10.1108/17538330810889989>
- Maxim, C. (2019). Challenges faced by world tourism cities – London's perspective. *Current Issues in Tourism*, 22(9), 1006-1024. <https://doi.org/10.1080/13683500.2017.1347609>
- Morrison, A. M. (2023). *Marketing and Managing Tourism Destinations* (3rd ed.). Routledge. <https://doi.org/10.4324/9781003343356>
- Pike, S. (2015). *Destination Marketing Essentials* (2nd ed.). Routledge. <https://doi.org/10.4324/9781315691701>
- Rauhut, D., & Rauhut Kompaniets, O. (2020). How to measure the impact of place marketing activities: a methodological discussion *Geografisk Tidsskrift - Danish Journal of Geography*, <https://doi.org/10.1080/00167223.2020.1767669>
- Reinhold, S., Beritelli, P., Fyall, A., Choi, H.-S. C., Laesser, C., & Joppe, M. (2023). State-of-the-Art Review on Destination Marketing and Destination Management. *Tourism and Hospitality*, 4, 584-603. <https://doi.org/10.3390/tourhosp4040036>
- Seguí-Amortegui, L., Clemente-Almendros, J. A., Medina, R., & Grueso Gala, M. (2019). Sustainability and Competitiveness in the Tourism Industry and Tourist Destinations: A Bibliometric Study. *Sustainability*, 11(22), 6351. <https://doi.org/10.3390/su11226351>
- Shanka, T., Beeton, S., & Lück, M. (Eds.). (2017). *Tourism in the city: Towards an integrative agenda on urban tourism*. Springer.
- Sotiriadis, M. (2021). Tourism Destination Marketing: Academic Knowledge. *Encyclopedia*, 1(1), 42-56. <https://doi.org/10.3390/encyclopedia1010007>
- UNWTO. (2012). *Tourism towards 2030: Global overview*. World Tourism Organization.



