

9TH INTERNATIONAL SCIENTIFIC-BUSINESS CONFERENCE
LEADERSHIP, INNOVATION, MANAGEMENT AND ECONOMICS:
INTEGRATED POLITICS OF RESEARCH



LIMEN 2023

Graz University of Technology, Graz, Austria
December 7, 2023 (hybrid)

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Contents

Index of Authors	XI
Index	XIII
Preface	XVII
LIMEN 2023 Participants' Affiliation	XXI
Health and Safety in the Human Resource Scorecard	1
Drago Pupavac	
The Role and Importance of Female Entrepreneurship in the Green Sector	9
Tatjana Jovanović Olga Gavrić	
What Do We Know about Albanian Women Entrepreneurs: Challenges and Opportunities	17
Silvana Gashi Denada Liça	
The Students' Perception of Their Soft Skills in Serbia	27
Agneš Slavić Maja Strugar Jelača Nemanja Berber	
Possible Directions for Innovations in Tourism	35
Lyubka Ilieva	
An Analytic Comparison of Quality Management Methodologies	45
Thaleia Dima Michail Glykas	
Service Quality in Business Excellence Maturity Assessment	51
Dimitrios Papadopoulos Georgios Karipoglou Michail Glykas Thaleia Dima	
Business Excellence Models and Systems of Production	59
Georgios Karipoglou Michail Glykas Thaleia Dima	
Product and Service Management Implementation Maturity Assessment – A Literature Review. A Proposal for a Maturity Assessment Framework	67
Dimitrios Papadopoulos Michail Glykas Thaleia Dima	
On the Risk Management in Land Consolidation Projects	75
Goran Marinković Zoran Ilić Žarko Nestorović Anđelko Matić	
On the Front Management of Land Consolidation Projects	81
Žarko Nestorović Milan Trifković Miroslav Kuburić	
Management Accounting in the Digital Era – One Accounting as Cloud Accounting Type	85
Mihaela Bebeșelea	
Digital Pricing Transformation & Pricing Technology	91
Bilyana Ivanova	

Investigating the Value of Sports Footwear Brands using Natural Language Processing Methods	105
Dijana Vuković Sara Slamić Tarade	
Evaluating the Action Design Research Methodology for Requirement Analysis, Modeling, and Engineering in Information System Design	115
Tea Tavanxhiu Kozeta Sevrani	
The Chaotic Productivity Growth Model: BRICS	125
Vesna Jablanovic	
Convergence of Competitiveness and Economic Efficiency Amongst Western Balkan Countries	131
Blerina Gjaci Arjan Tushaj Engjëll Pere Albana Hashorva	
Comparison of the Economic Activity Rate of Population in the Slovak Republic and the Czech Republic	141
Dana Országhová	
The Dynamics of Albanian Insurance Market and Its Importance in Economic Development	149
Klaudia Lipi	
Banking at a Turning Point	159
Vladimir Mladenović Milica Krulj-Mladenović Danilo Obradović Dobrica Radovanović	
The Role of the Central Bank in Green Financing through the Banking Sector in Romania	165
Valentin Mihai Leoveanu	
Bridging Markets: Exploring Short-Term Trends in Cryptocurrencies and Green Finance	175
Rui Dias Mariana Chambino Paulo Alexandre Rosa Galvão	
From Crisis to Connectivity: Unraveling Sustainable Energy Indexes	185
Rui Dias Mariana Chambino Paulo Alexandre Rosa Galvão	
Tax System in Bosnia and Herzegovina	193
Nerma Čolaković-Prguda	
Micro-Level Insights into the Impact of R&D Tax Credits on Firm Behavior in the Portuguese Services Industry	201
Alexandre Paredes Bruno Damásio	
Sustainable Agriculture and Development in Morocco	209
Es-safi Nour Eddine Rachidi Abdelhaq	
Comparative Analysis of Cloud-Based and Traditional Accounting	219
Suzana Keglević Kozjak Tanja Šestanjić-Perić Zrinka Lacković Vinček	

Using Openai’s Chat GPT in Accounting: Pros, Cons Ethical Issues and Evaluating Its Role in Supporting Double-Entry Bookkeeping	227
Dejan Spasić Irina Joldeska Anton Vorina Vid Vorina	
Sustainability Pillars and ISO Standards: The Case of Serbia	239
Andrea Ivanišević Aleksandra Pavlović Danijela Ćirić Lalić Žikica Milošević Maja Petrović	
Economic Growth, Energy Consumption and CO₂ Emissions in the European Union. A Panel Data Analysis	245
Iva Raycheva	
Business Transformations through the Application of the Circular Economy	253
Teodorina Turlakova	
Circular Economy in the Tourism Sector: An Overview of Tourism Enterprises and Tourist Behavior	261
Raffaella Cassano Francesca Gennari Francesca Rinaldi	
Certification and Assessment of Sustainable Construction in a Circular Economy	269
Katya Antonova	
Unlocking Synergy: Are CESEE Countries Effectively Integrated into Global Value Chains?	281
Jasna Tonovska	
Placement of Small Producers in Large Retail Chains	291
Sandra Mrvica Mađarac Zvonimir Filipović Slobodan Stojanović	
Virtuality of Economy as a Segment of Postmodern Theory	301
Violeta Gligorovski	
Exploring Theoretical Frameworks for Analyzing the Security Behavior of Smartphone Users	311
Enxhia Sala Edlira Martiri	
Enhancing Security in the Age of Electronic Public Services in Albania	323
Jorgo Ćipa Kozeta Sevrani	
Innovation in the Tourism Sector – Case of Vlore Municipality	333
Brikena Sika	
Film Tourism as a Promoter of Tourism Development in Korca Region	339
Alma Zhilla	
Gastronomy at the Crossroads Towards Climate Neutrality: From Counting Calories to Monitoring CO₂ Emissions	349
Iva Tolić Mandić Sanja Tišma Ivana Biondić	

Business Management Strategies for Water Supply Systems in the Republic of Croatia: Mitigating Water Loss as a Performance Indicator	359
Vladimir Botica	
Improving Water Resource Management: Evapotranspiration-Based or Tensiometer-Based Irrigation Scheduling	367
Elena Grancharova Blagoj Elenov Emilija Elenova	
Evaluation of Volatile Organic Pollutants in Water Samples from Durres's Port by Using the HS/SPME Technique	373
Esmeralda Halo Bledar Murtaj Aurel Nuro	
Integrated Urban Waste Management (Case study, Vlora Municipality)	381
Amali Çipi	
Dynamics of Population Structure: A Comprehensive Analysis of Romania Using Census Data and Population Pyramids	391
Irina-Elena Stoica	
The Effect of Financing Political Parties in the Economy: Case of Albania	399
Sorina Koti	
Optimizing Contracting via Performance-Based Contracts	407
Elena-Iuliana Gheorghe	
Implementation of PPP Contracts: Pros and Cons	413
Egra Ibrahim	
Simplified Limited Liability Company	423
Marko Andonov Ljubomir Radenkov Dzena Anastasova	
Challenges to Legal Education in the Modern Digital World	431
Petya Mitreva Adelina Hadzhiyska	
DSA & DMA – The Role of Dual Regulation	437
Andreea Enescu	
Reflections of European Market Law on the Croatian Legislative Framework of Consumer Protection	447
Sanja Gongeta	
Beyond Adjudication: European Court of Human Rights Pilot Judgment's Role in Shaping Albanian Legislation	457
Iva Tërova (Pendavinji)	
Patterns of Geographic Gender Based Violence: Politics, Culture and Development Issues	467
Reina Zenelaj Shehi Endi Tirana Ajsela Toci	



Index of Authors

A

Adelina Hadzhiyska, 431
Agneš Slavić, 27
Ajsela Toci, 467
Albana Hashorva, 131
Aleksandra Pavlović, 239
Alexandre Paredes, 201
Alma Zhilla, 339
Amali Çipi, 381
Anđelko Matic, 75
Andrea Ivanišević, 239
Andreea Enescu, 437
Anton Vorina, 227
Arjan Tushaj, 131
Aurel Nuro, 373

B

Bilyana Ivanova, 91
Blagoj Elenov, 367
Bledar Murtaj, 373
Blerina Gjaci, 131
Brikena Sika, 333
Bruno Damásio, 201

D

Dana Országhová, 141
Danijela Ćirić Lalić, 239
Danilo Obradović, 159
Dejan Spasić, 227
Denada Liça, 17
Dijana Vuković, 105
Dimitrios Papadopoulos, 51; 67
Dobrica Radovanović, 159
Drago Pupavac, 1
Dzena Anastasova, 423

E

Edlira Martiri, 311
Egra Ibrahim, 413
Elena Grancharova, 367
Elena-Iuliana Gheorghe, 407
Emilija Elenova, 367
Endi Tirana, 467
Engjëll Pere, 131
Enxhia Sala, 311
Esmeralda Halo, 373
Es-safi Nour Eddine, 209

F

Francesca Gennari, 261
Francesca Rinaldi, 261

G

Georgios Karipoglou, 51; 59
Goran Marinković, 75

I

Irina-Elena Stoica, 391
Irina Joldeska, 227
Ivana Biondić, 349
Iva Raycheva, 245
Iva Tërova (Pendavinji), 457
Iva Tolić Mandić, 349

J

Jasna Tonovska, 281
Jorgo Çipa, 323

K

Katya Antonova, 269
Klaudia Lipi, 149
Kozeta Sevrani, 115; 323

L

Ljubomir Radenkov, 423
Lyubka Ilieva, 35

M

Maja Petrović, 239
Maja Strugar Jelača, 27
Mariana Chambino, 175; 185
Marko Andonov, 423
Michail Glykas, 45; 51; 59; 67
Mihaela Bebeșelea, 85
Milan Trifković, 81
Milica Krulj-Mladenović, 159
Miroslav Kuburić, 81

N

Nemanja Berber, 27
Nerma Čolaković-Prguda, 193

O

Olga Gavrić, 9

P

Paulo Alexandre, 175; 185
Petya Mitreva, 431

R

Rachidi Abdelhaq, 209
Raffaella Cassano, 261
Reina Zenelaj Shehi, 467
Rosa Galvão, 175; 185
Rui Dias, 175; 185

S

Sandra Mrvica Mađarac, 291
Sanja Gongeta, 447
Sanja Tišma, 349
Sara Slamić Tarade, 105
Silvana Gashi, 17
Slobodan Stojanović, 291
Sorina Koti, 399
Suzana Keglević Kozjak, 219

T

Tanja Šestanjanj–Perić, 219
Tatjana Jovanović, 9
Tea Tavanxhiu, 115
Teodorina Turlakova, 253
Thaleia Dima, 45; 51; 59; 67

V

Valentin Mihai Leoveanu, 165
Vesna Jablanovic, 125
Vid Vorina, 227
Violeta Gligorovski, 301
Vladimir Botica, 359
Vladimir Mladenović, 159

Z

Zoran Ilić, 75
Zrinka Lacković Vincek, 219
Zvonimir Filipović, 291

Ž

Žarko Nestorović, 75; 81
Žikica Milošević, 239



Index

#

2020 and 2022 Events, 175

A

Accounting, 227
Accounting information systems, 219
Action design research, 115
Albania, 467
Albanian entrepreneurs, 17
Artificial intelligence, 227; 431
Assessment indicators, 269

B

B2B markets, 91
Banking, 159
Basic capital, 423
Benefits, 413
Bosnia and Herzegovina, 193
Brand significance, 105
Brand value, 105
BRICS, 125
Business challenges, 261
Business excellence, 59
Business Excellent Models, 51; 59
Business management, 359
Business transformations, 253
Buying power, 399

C

Carbon dioxide, 245
Cards, 159
Census data, 391
Central bank, 165
Certification systems, 269
CESEE, 281
Challenges, 17
Chlorobenzenes. BTEX, 373
Circular economy, 253; 261; 269
Clean energy indexes, 175
Climate change, 165; 349
Climate neutrality, 349
Cloud accounting, 85
Cloud-based technologies, 219
Cloud computing, 85
Co-movements, 175
Comparative analysis, 219

Competitiveness, 131
Connectedness, 185
Consumer protection, 447
Continuous improvement, 45
Contract architecture, 407
Contract formation, 407
Convergence, 131
Corruption, 399
Croatian legislative framework, 447
Cryptocurrencies, 175

D

Decision making, 81
Demographic trends, 391
Destination, 339
Developing countries, 413
Development, 333; 381
Digital markets, 437
Digital revolution, 91
Digitization, 323
DMA, 437
DSA, 437

E

E-Albania, 323
“Eat What’s Worth It”, 291
E-Commerce Directive, 437
Economic activity rate, 141
Economic efficiency, 131
Economic growth, 245
Economic stability, 149
Economic theory, 407
ECtHR, 457
Effective policy, 413
EFQM, 59
Electronic public services, 323
Energy consumption, 245
Environment, 381
ERP (Enterprise resource planning) systems, 85
Ethical issues, 227
European market law, 447
Evapotranspiration-based irrigation scheduling, 367
Exports, 281

F

“Field to Table”, 291
Film tourism, 339
Financial accounting, 85
Financial innovation, 175
Financial intermediation, 165
Financing parties, 399
Firms, 201
Fiscal policy, 193
Food security, 209
Food system, 349
Front manager, 81
FTE staff, 201

G

Gastronomy, 349
GC/ECD/FID, 373
Gender violence, 467
Geography, 467
GHG emission, 349
Global Value Chains, 281
Green economy, 9; 185
Green financing, 165
Green Generation, 209
Green Morocco Plan, 209

H

Health and safety, 1
Hedge assets, 185
HS/SPME, 373
Human resource, 1
Human Resources Management, 59
Hyper reality, 301

I

Identity, 467
Impact, 457
Information security, 311
Information systems, 115
Innovation activity, 35
Innovations, 35
Innovation trajectory, 35
Innovative economic model, 253
Innovative strategies, 333
Insurance market, 149
Integrated management, 381
Internet, 159
ISO standards, 239

L

Labour market, 141
Landownership, 75
Large retail chains, 291
Law, 431
LCP environment, 81
Leader, 81
Legal education, 431
Legislation, 457
Limited Liability Company (LLC), 423

M

Management accounting, 85
Management of natural resources, 209
Manager, 81
Market dynamics, 149
Maturity assessment, 51; 67
Mobile banking, 159
Mobile technology, 311
Modern digital world, 431

N

Natural Language Processing, 105

O

Open Chat GPT, 227
Operations management, 67
Opportunities, 17
Organized crime, 399

P

P2B Regulation, 437
Panel data, 245
Performance-Based Contracts, 407
Personal data, 323
Personalised experience, 339
Pilot judgment, 457
Population growth, 381
Population pyramid, 391
Population structure, 391
Port of Durres, 373
Postmodernism, 301
PPP, 413
Pricing models, 91
Pricing technology, 91
Privacy, 311
Process management, 67
Productivity, 125

Product management process, 67
 Project failure, 75
 Property, 457

Q

Quality Management, 59
 Quality management methodologies, 45

R

RADAR matrix, 45
 R&D, 201
 Regulatory constraints, 149
 Requirement analysis, 115
 Requirement engineering, 115
 Requirement modeling, 115
 Research, 291
 Risk, 75; 413
 Risk management, 75
 Risk mitigation, 75
 Rural population, 209

S

Scorecard, 1
 Security, 323
 Semantic Brand Score, 105
 Serbia, 27
 Service management, 67
 Service quality, 67
 Service Quality Management, 51
 Servqual, 51
 Simplified Limited Liability Company (SLLC),
 423
 Six Sigma, 45
 Small producers, 291
 Socio-economic factors, 149
 Soft skills, 27
 Stability, 125
 Standardization, 239
 Strawberry, 367
 Structural dysfunction, 457
 Students' perception, 27
 Sustainability, 165
 Sustainability pillars, 239
 Sustainable agriculture, 209
 Sustainable construction, 269
 Sustainable development, 9: 239
 Sustainable tourism, 261; 339
 System design, 115

T

Taxes, 193
 Tax incentives, 201
 Tax system, 193
 Tensiometer-based irrigation scheduling, 367
 Theoretical frameworks, 311
 Topic modeling, 105
 Tourism, 35; 339
 Tourism industry, 333
 Tourist behavior, 261
 Transparency, 399

U

Unemployment rate, 141
 Urban waste, 381
 Useful agricultural area, 209
 Virtual, 301
 VOC, 373

W

Water loss, 359
 Water resource management, 367
 Water supply, 359
 Women, 17; 467
 Women entrepreneurship, 9
 Work experience, 27
 Workforce, 141



Preface

Organizing is an evolutionary phenomenon, distinctive because of the laws of existence and maintaining all structures in all processes of their functioning. As such, it is a civilizational phenomenon that occurs as a component of human, individual, and social activities and as a factor in the overall development of man and society. On the other hand, as a deliberate human activity, organizing involves seeking solutions to problems that occur on the way to achieving specific goals. No goal can be achieved without appropriate or necessary, or at least minimal organization of conditions, factors, and processes needed for goal achievement. However, the new era requires new types of leaders and managers and new forms of organization; demands those who are willing and able to lead the company/corporation/state, in a distinct competitive environment, with all the good and bad sides brought by the globalization of world economy.

The purpose of the annual LIMEN conference is to support the power of scientific research and dissemination of the research results with the objective to enhance society by advancing knowledge; policy-making change, lives, and ultimately, the world. Our objective is to continue to be the foremost annual conference on cutting-edge theory and practice of leadership, innovations, management, and economics, encouraging advancement via excellence, and interaction.

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Association of Economists and Managers of the Balkans headquartered in Belgrade – Serbia in cooperation with the Institute of Business Economics and Industrial Sociology of the Faculty of Mechanical Engineering & Economics Sciences at Graz University of Technology headquartered in Graz – Austria; along with the partner institutions, namely the Center for Advanced Studies in Management and Economics (CEFAGE-UE), Institute for Advanced Studies and Research, University of Evora, Portugal; Department of Law, Economics and Sociology, University of Magna Graecia, Catanzaro, Italy; Faculty of Economics, University of South Bohemia, České Budějovice, Czech Republic; Rio de Janeiro Institute College (Faculdade Instituto Rio de Janeiro – FIURJ), Rio de Janeiro, Brazil, and the European Professors of Industrial Engineering and Management (EPIEM) organized 9th International Scientific-Business Conference

titled: Leadership, Innovation, Management, and Economics: Integrated Politics of Research – LIMEN 2023 on December 7, 2023 at the Graz University of Technology, Graz, Austria in a hybrid format (in-person, online and virtually).

LIMEN 2023 conference addresses various contemporary business and economic challenges. The evolution of implicit leadership theories is explored, highlighting shifts in understanding leadership. AI-driven HR practices in SMEs, the application of large language models in recruitment, and the integration of crowdsourcing with intellectual capital for enterprise renewal are examined for their innovative potential. The impact of management styles on employee well-being, the relationship between innovation and competitive advantage, and eco-innovation in Albania's accommodation sector are analyzed for their implications on business strategy and sustainability. The digital transformation of retail, AR/VR in marketing, and content marketing's role in consumer loyalty are also discussed, alongside the ethical concerns of greenwashing in marketing communication. Other studies investigate the sustainability index in corporate performance, the resilience of eco-metals, mobile banking acceptance in Austria and Romania, and the role of standards and patents in Western Balkan economic growth. Income inequalities in Greece's post-COVID tourism industry and logistics in unstable markets are assessed for their broader economic impacts, etc.

The keynote speaker at the LIMEN 2023 conference was Professor Sandra Lovrenčić, Full Professor, Head of the Department of Theoretical and Applied Foundations of Information Sciences, Head of Centre for Volunteering and Humanitarian Work, University of Zagreb Faculty of Organization and Informatics, Varaždin, Croatia with the topic "Artificial Intelligence and (Knowledge) Management".



Within publications from the LIMEN 2023 conference:

- 20 double peer-reviewed papers have been published in the **LIMEN 2023 Selected Papers**,
- 55 double peer-reviewed papers have been published in the **LIMEN 2023 Conference Proceedings**,
- 67 abstracts have been published in the **LIMEN 2023 Book of Abstracts**.

Altogether LIMEN 2023 publications have more than 800 pages. All full papers have DOI numbers and ORCID iD integration.

Participation in the conference took **more than 250 researchers** representing **24 different countries** from different universities, eminent faculties, scientific institutes, colleges, various ministries, local governments, public and private enterprises, multinational companies, associations, etc.



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Health and Safety in the Human Resource Scorecard

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Abstract: *Human resource management is the utilization of human resources to achieve organizational objectives. Health and safety become among the most important functional areas associated with effective human resource management. These aspects of human resource management are important because employees who work in a safe environment and enjoy good health are more likely to be productive and yield long-term benefits to the organization. That means it is necessary to include health and safety in the human resource scorecard (HRS) as a measure of the growth of the effective strength of employees. The research results are based on practical example analysis.*

1. INTRODUCTION

Kaplan and Norton (1996) developed The Balanced Scorecard model (BSC) for managing corporate success at a strategic level. The model represents an integrated system of goals and performance measures viewed through four perspectives: 1) financial, 2) customer perspective, 3) internal process perspective, and 4) learning and growth perspective. The four perspectives do not represent a mere sum of indicators but a unique interconnected system. The subject of research of importance for this paper will be the fourth BSC perspective, which refers to the ability of companies to invest in human capital, systems, and organizational procedures in order to increase employee productivity and product quality. Within this perspective, the degree of alignment of individual and organizational goals is also measured. They are most often included as benchmarks (Kolačević & Hreljac, 2012): degree of employee co-decision, indicators of employee satisfaction, percentage of employee access to key information, employee retention rate in key positions, employee attrition rate, percentage of employees with a university degree, number of hours spent on training, the amount of production per employee, the amount of income per employee, the number of proposals received from employees, the added value of employees, etc.

Accordingly, an HRS will be developed to measure the impact of human resources on the achievement of the company's strategic goals. However, in order to get a complete picture of the efficiency of human resource management as a measure, it is necessary to include the health and safety of employees. Such an approach also seems appropriate because the health and safety of employees is an important element of the human resources management system. Workplace safety is the absence of hazard risk, or injury on the job, whereas health focuses on environmental health hazards and infectious diseases that can affect the workplace (Mitchell & Gamlem, 2017). A high level of health and safety protection at work is directly related to other measures. A high level of employee health and safety protection reduces the level of employee dissatisfaction (Herzberg et al., 1959), the rate of employee turnover (Aman-Ullah et al., 2022), and increases employee loyalty (Hermawan et al., 2019), employee commitment to the organization (Kaynak et al., 2016) their involvement (Saleem, M. S., et al., 2022) in work and work productivity measured by natural or value indicators (Abad et al., 2013; Danish et al., 2013; Mearns et al., 2010).

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2. THEORETICAL FRAMEWORK AND RESEARCH PROBLEM

In the 1990s, the importance of human resources management for the achievement of the company's strategic goals was recognized. The human resources department ceases to be dominantly involved in administrative tasks and is increasingly involved in the creation and implementation of the company's strategy. Successful implementation of the strategy requires appropriate management of human resources, directing them toward the achievement of the mission, vision, and organizational goals. Human resources become a strategic asset. The HR department is thus directly placed in the function of other line managers of the organization to develop a strategic HR plan that will be linked to the strategic plan of the organization. The connection between these two strategic plans guarantees timely quantitative and qualitative alignment of human resources with organizational goals and the realization of the company's mission. The evolutionary development of human resources management went exactly in this direction. Namely, four models are noticeable in the practice of human resource management (Becker et al., 2021): 1) The personnel perspective model - the emphasis is on acquiring and hiring the required number of employees, 2) The compensation perspective model - the emphasis is on building a system rewards to recognize and reward better employees, 3) The alignment perspective model - the head of human resources emphasizes the importance of aligning human resources with the strategic goals of the organization, but they do not review the capabilities of human resources and 4) The high-performance perspective model - the head of human resources and others line managers see human resource management as a source of competitive advantage and emphasize the necessity of measuring the contribution of human resources to the achievement of the organization's strategic goals. The new paradigm of human resource management emphasizes the fourth model.

In order to add real value to organizations, HR professionals must understand the business they are in – not just their part of the business. In addition to the economic knowledge that human resources managers need, the strategic map of human resources can be a handy tool in this direction (Figure 1).

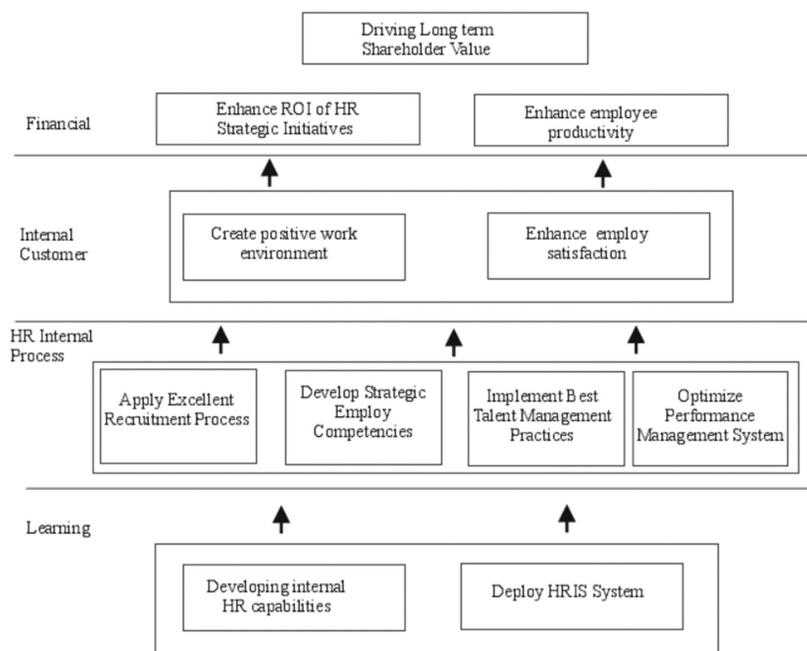


Figure 1. HR Strategy Map

Source: Author prepared according to [HR Management Slides, 2024](#)

The HRS of human resources should be connected to the BSC of the organization, that is, the company's strategy should be the starting point for the construction of the HRS (Gulin et al., 2008). Because the organizational BSC identifies the fundamental measures of success, the HRS of human resources cascades from it (Belak, 2002). Integrating performance from four perspectives, BSC is an ideal tool for testing the implementation and execution of human resources strategy in the function of the key measures of the organization's success depends on achieving the goals in management's success. HRS's success depends on achieving the goals of managing human resources through all parts of the value chain. Learning and growth are necessary to improve internal processes, and improving internal processes results in increased employee satisfaction, which is a prerequisite for increased work productivity.

To develop the HRS map as a function of connecting people, strategy, and company performance, in the first step, it is necessary to determine the benchmarks and their number according to individual perspectives: financial perspective, customer perspective, internal perspective, and learning and growth perspective. It is desirable to take several benchmarks (important for the company) for each perspective, with the fact that the number of benchmarks does not have to and should not be equal, just as each benchmark should not have the same weighting factor in assessing its importance in creating the success of HR management via the scorecard. The total value of all benchmarks has to be 100%.

Thus, for example, the reduction of human resource management costs, return on investment in human resources and increase in labor productivity measured by value indicators (profit per employee, income per employee) can be taken as measures from the financial perspective. Creating a pleasant work environment and increasing employee satisfaction can be the main benchmarks of the perspective of internal customers. From an internal perspective, the emphasis can be on criteria such as the success of the process of recruiting new employees, developing strategic competencies of employees, talent management, and establishing a system for evaluating work performance. From the internal perspective, it seems appropriate to include a criterion related to the health and safety of employees. Within this criterion, accidents at work, occupational diseases, and programs aimed at improving the well-being of employees can be observed. Regarding the perspective of learning and growth, it seems appropriate to set benchmarks related to the development of human resources and the development of an adequate information system in the function of human resources management. After the benchmarks that will be monitored have been determined for each of the four perspectives, it is necessary to determine the weighting factor for each benchmark and evaluate the current performance of each benchmark with a score from 1 to 5. The performance index is determined as the product of the weighting factor and the rating of the current performance, and the top performance as the product of the weighting factor and the maximum rating (5) of each criterion. The gap between these two results shows the extent to which the company achieves the desired goals according to each measure individually, and the gap between the total current performance and the total top performance shows the extent to which the set goals related to human resources management have been achieved. For example, a gap of 17% between the current and top performance indicates the fact that the set goals were achieved at the level of 83%.

3. DATA AND RESEARCH METHODOLOGY

For research in this work, an HRS map was developed (cf. table 1), which will serve as a basis for scientific analysis and drawing relevant conclusions about the strategic contribution of human resources in achieving the strategic goals of the organization.

Table 1. A practical example of an HRS map

KPI	Weight %	Actual Performance (1-5)	Performance Index	Top Performance (5)	GAP
1	2	3	$4=2 \times 3$	$5=2 \times \text{value} 5$	$6=[(4-5)/5] \times 100$
Financial					
Reduce the cost of HR management	12,5	3	37,5	62,5	-40
Increase employee productivity	12,5	3	37,5	62,5	-40
Customer					
Increase employee competence	6,8	4	27,2	34	-20
Increase employee satisfaction	7,4	3	22,2	37	-40
Improve employee discipline	3,2	4	12,8	16	-20
Increase employee responsibilities	7,6	3	22,8	38	-40
Internal Business Process					
Improve the correspondence process	4,2	3	12,6	21	-40
Implement a transparent performance appraisal system	4,2	3	12,6	21	-40
<i>Improve employee welfare</i>	4,1	4	16,4	20,5	-20
<i>Minimize work accident</i>	5,3	3	15,9	26,5	-40
<i>Improve occupational health</i>	4,1	4	16,4	20,5	-20
Improve supervision of employee	3,1	4	12,4	15,5	-20
Learning and growth					
Improve training	12,5	3	37,5	62,5	-40
Improve employee commitment to organization culture	12,5	4	50	62,5	-20
Total	100		337,9	500	-33,24

Source: Own calculations

The task of this approach, in addition to measuring the impact of human resources on the performance of the organization, is to highlight the importance of occupational health and safety in human resource management. The basic hypothesis of this work is that the improvement of health and safety at work contributes to the creation of added value in human resource management, which contributes to the achievement of strategic organizational goals. Proving the hypothesis is based on the descriptive scientific method, the mathematical method, the methods of analysis and synthesis, and the scientific methods of induction and deduction.

4. RESEARCH RESULTS

The obtained result of the HRS map in the observed company shows that the total achievements of the set goals were achieved at the level of 66.76%. It can be said that the planned goals were not achieved, which points to the fact that the initiatives were not fully realized. In the presented example (cf. table 1), a weighting factor of 13.5 (5.3+4.1+4.1) was assigned to employee health and safety. A higher weighting factor attached to employee health and safety may be the result of worse working conditions that need to be improved or an organizational culture that emphasizes the protection of employee health and safety as a core value of the organization. Omitting health and safety from the HR Scorecard folder or giving a lower weighting factor to employee health and safety may mean that there are no workplaces in the organization with a high risk for employee health and safety, that the organization has a special safety service separated from the human resources department to paid as much attention as possible to the health and safety of employees or that the organization does not attach importance to the health and safety of employees at all, as is often the case in organizations in economically less developed parts of the world.

The health and safety of employees at work is one of the fundamental human rights. The health and safety of employees in organizations begins with learning and developing an organizational culture dedicated to preserving and improving health and safety at work. Training to work safely is an integral part of learning in the organization. The training and development of employees should be seen as a long-term, permanent process, which ensures the company's income growth and labor productivity. The training of workers to work safely is carried out according to a training program that must be based on a risk assessment and must include all hazards, harms, or efforts determined by the risk assessment, as well as ways of applying the principles of prevention and the rules of occupational safety concerning the risks present. In the culture of safety, the fundamental value of the company is represented by the principles and goals of protecting the health and safety of employees. Creating an integrated culture of safety at work is important for employees and their families, the organization itself, and ultimately for society as a whole. In an integrated safety culture, safety concern should be reflected in all decisions at all levels, in all company processes. Organizations that reduce risk to employee health and safety increase value. A humanistic approach to human resource management is the right answer to these demands. The humanistic approach to human resources highlights the human side of labor productivity.

While the traditional approach to measuring the performance of human resources from the perspective of internal processes refers to the use of control and ignores the past and the safety of employees, the HRS approach highlights the importance of protecting the health and safety of employees, as well as the importance of raising the level of employee well-being. Numerous organizations offer their employees wellness programs to improve their health. Johnson & Johnson company managers estimated that for every dollar spent on wellness programs, they get a return of \$2.71 (Berry et al., 2010). Thus, employees become healthier, more satisfied, more motivated, and more productive (Mitchell & Gamlem, 2017).

Non-financial measures such as competence and employee satisfaction detect problems before they can affect financial results, labor productivity, and costs, providing HR management with the necessary time for corrective action. Measuring job satisfaction is important because of the costs of dissatisfaction, which manifests itself through turnover, absenteeism, and reduced work productivity. According to a model developed by the global retail chain Sears, a 5% increase in employee satisfaction leads to a 1.3% increase in customer satisfaction, resulting in a 0.5% increase in sales (Dess & Lumpkin, 2005).

Regarding the health and safety of employees in the presented example, a significant deviation from the set goals is visible, especially in the area of reducing the number of accidents at work. The gap in this area is as much as 40%. A large gap in the field of employee safety can significantly threaten the achievement of the organization's strategic goals. Neglecting employee health and safety can result in a negative work environment and employee dissatisfaction. A bad working environment and employee dissatisfaction lead to lower work productivity measured either by natural or financial indicators, which endangers the interests of the organization and all its stakeholders. Ignoring the health and safety of employees can especially hurt financial indicators. The financial approach to human resources highlights costs as the main measure when it comes to human resource management. Every accident at work can also be viewed from an economic aspect. Building a safe working environment contributes to reducing the number of accidents at work and reducing the employer's costs, which contributes to the achievement of long-term goals and the growth of the company.

5. CONCLUSION

Health protection and safety at work are becoming an increasingly demanding, mandatory, and visible activity in the framework of human resources management. Organizations in which health and safety are a priority emphasize a humanistic approach to human resource management, are more desirable as an employer, and are more efficient in achieving their goals. HRS is an excellent tool for testing strategy implementation and execution procedures. The connection between human resources management and company strategy is ensured in such a way that the HRS is developed from the BSC. HRS should contain important benchmarks from all four perspectives: financial, internal customers, internal processes, and learning. Employee satisfaction is a guiding benchmark for benchmarks from a financial perspective (labor productivity), but it can also be the final benchmark viewed through the dimension of health and safety protection, which increases employee satisfaction through good and safe working conditions, the absence of accidents at work, and the improvement of employee health. eventually results in better financial effects. Just as health and safety protection is a leading indicator of employee satisfaction, it can also be the ultimate measure of employee training and commitment to organizational culture. By including employee health and safety protection in the HRS, an integral approach to assessing the importance of this criterion in creating added value for the company is enabled.

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The Role and Importance of Female Entrepreneurship in the Green Sector

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Abstract: *In recent times, the universal valuation of women and their position in modern society is being questioned more and more. This is especially important within the entire economy, economic processes, as well as the green economy. The paper specifically points out the potential of female entrepreneurship in Serbia, as well as the challenges that stand in the way. The focus of the investigation is the possibility of developing female entrepreneurship in the green sector as a function of the socio-economic development of cities and municipalities, with a special emphasis on the connection between female entrepreneurship and the goals of sustainable development. This contributes to greater involvement of women in the business and economic environment increases overall employment and encourages macro competitiveness.*

1. INTRODUCTION

There is no agreement among theoreticians regarding the definition of the concept of entrepreneurship. The complexity of the term suggests that sometimes in the definition the emphasis is placed on economics, sometimes on social development, and sometimes on changes, sustainability, or competitiveness. Entrepreneurs are theoretically defined as “economic actors who combine factors of production and other relevant resources innovatively and thus move them from a sector of lower to a sector of higher productivity and higher income. *“In these efforts, they seek out and take advantage of opportunities in the given context and evaluate and take the risks of their decisions and actions”* (UN Women, 2023). For the area of the European Union, the European Commission defined entrepreneurship as *“the process of creating and developing economic activity by combining risk-taking activities, creativity and/or innovation with strong management, within a new or existing organization”* (CEC, 2003, as cited in UN Women, 2023).

In the last thirty years, exceptional attention has been paid to female entrepreneurship. Numerous researches around the world were carried out in parallel in the domain of theory, practice, and politics. As the scope of research on women’s entrepreneurship has developed, there has been a greater focus on how gender shapes our understanding of entrepreneurship, especially when considering normative models of entrepreneurship (McAdam, 2022).

The question of who or what is an entrepreneur opens a wide field of research on how women fit into the modern entrepreneurial framework or discourse.

Despite all the theoretical and applied definitions, the field of female entrepreneurship research is still in its infancy. The first works on female entrepreneurship date back to the late seventies. Namely, in 1976, Schwartz published the first work on female entrepreneurship in the “Journal

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of Contemporary Business”, under the title: “Entrepreneurship - new female frontiers” (Green et al, 2001, as cited in [McAdam, 2022](#)). Before this work, entrepreneurship was considered a gender-neutral concept, it was not gendered into men and women. With the emergence of female entrepreneurship, gender inequality comes to the fore, i.e. the opinion that social assumptions contribute to stereotypes attributed to gender categories ([McAdam, 2022](#)).

Definitions of female entrepreneurship differ concerning the geographical area, so we say that it is a geographically sensitive term, which creates difficulties when comparing and classifying theoretical and applied definitions of this term.

For example, In England, a woman-owned business is wholly or majority owned by one or more women. In 2017, UN Women defined a women’s company where at least 51% is owned by one or more women, realistic management of the company’s business operations and long-term business decision-making by women, and independence from companies that are not owned by women. In our country, women are identified as entrepreneurs who own companies in any ownership share, but who at the same time perform a leading managerial role ([UN Women, 2023](#)).

The main subject of this work is the study of female entrepreneurship through the connection with SDG (Sustainable Development Goals) in the Republic of Serbia.

In that way and from that angle, the main goal of this paper is to show the greater involvement of women in the economy and the economic environment in Serbia, which in turn contributes to greater employment and the reduction of both gender differences and poverty.

In our analysis, we started with two assumptions:

1. The development of female entrepreneurship contributes to the reduction of inequality and poverty in society, and
2. Strengthening female entrepreneurship contributes to increasing innovative potential and economic and social development.

2. BUSINESS MODELS AND GREEN SECTOR

Global warming and the devastation of ecosystems have contributed to the actualization of the topic of environmental protection and natural resources in Serbia and the world. The aforementioned tendencies emphasized the need for circular processes, the use of cleaner technologies and renewable sources, and the application of recycling. Bearing in mind the multidisciplinary character of the circular economy, there is no single definition of this concept in the literature. [Majernik et al. \(2021\)](#) define the circular economy as a sustainable development strategy that establishes functional relationships between nature and society. According to [Ghisellini et al. \(2016\)](#), the circular economy is the main paradigm of environmental sustainability, which aims to create economic and industrial structures that reduce the use of natural resources and waste generation. In other words, this concept is based on two principles:

1. efficient management of resources, and
2. minimizing waste ([EEA, 2020](#)).

Circularity has several specificities and characteristics. First, it encourages the creation of green products and changes in all phases of the life cycle. Second, innovations represent an indispensable element of CE implementation, which in the next instance contributes to the creation of a

stimulating environment for further innovation processes and the use of renewable resources. Third, more efficient use of resources reduces the overall carbon footprint. Last but not least, the application of the circular economy is associated with the definition of new business models and the growth of employment in green sectors.

In business practice, five main business models have been distinguished (Mitrović & Pešalj, 2021):

1. model/strategy of circular input suppliers,
2. model/strategy of waste recovery,
3. model/strategy of product life extension,
4. the model/strategy of collaborative platforms that promote the sharing of products or resources between individuals and organizations, and
5. the product-as-a-service model/strategy.

Modern companies have made a kind of strategic turn in the direction of adopting the concept of ESG and implementing the 3P (profit, people, planet) principle. In this regard, companies strive to achieve economic and environmental sustainability in addition to satisfactory business results. The aforementioned business trends also encouraged the development of green employment, green markets, green distribution channels and the emergence of a new category of consumers.

Accordingly, green employment is closely linked to the environmental and clean energy sectors (Ge & Zhi, 2016). The application of innovations often results in the emergence of green workplaces (Aldieri & Vinci, 2018). In general, we distinguish three types of jobs in green sectors:

1. jobs that are directly related to CE,
2. jobs that are indirectly related to CE, and
3. jobs that are related to CE support activities (Dufourmont & Goodwin Brown, 2020).

In the period from 2000-2015, employment in the green sector increased by 47% in the territory of the EU 28. In absolute terms, the total number of green jobs amounted to 3 million (EEA, 2020). The largest increase in jobs was achieved in the waste management sector (including recycling) (Mitrović & Pešalj, 2021).

3. THE SOCIO-ECONOMIC CONTEXT OF THE STUDY OF FEMALE ENTREPRENEURSHIP

Within the socio-economic context of studying women's entrepreneurship, we wanted to point out the importance and role that women's entrepreneurship plays in reducing (gender) inequality and poverty in society in general.

3.1. The Role of Female Entrepreneurship in Reducing Inequality and Poverty

When we talk about the broader socio-economic environment, it contains a number of unfavorable conditions for the development of women's entrepreneurship, while the personal experience of female entrepreneurs goes in that direction. The very economic conditions that are unfavorable in Serbia, along with gender inequalities, contribute to the impossibility of both women's entrepreneurship and the affirmation and development of business strategies.

Empowerment of women is a significant factor in mitigating and eliminating gender inequality and creating conditions for "gender equality" in all spheres of life. According to the OECD

nomenclature, gender equality is defined as “the absence of overt or hidden disparities between individuals based on gender in terms of opportunities, resources, services, benefits, decision-making, power and influence (OECD, 2011, p. 26, as cited in [Khan, 2015](#)).

In Babović’s opinion ([Babović, 2012](#)), without the possibility of going into a broader analysis of gender inequalities, it is necessary to point out several most important aspects that are of more immediate importance for women’s entrepreneurship:

1. the position of women in the labor market is less favorable than the position of men,
2. the property gender gap creates an unfavorable economic basis for women to start their businesses,
3. unequal power relations in the sphere of privacy impose on women most of the obligations related to household and family care, leaving less space for devoting to a career in general and an entrepreneurial one in particular, and
4. still, widespread patriarchal values, which are often internalized by women themselves, create a lack of self-confidence and willingness to embark on ventures that involve certain risks.

Women’s empowerment revolves around three components: education, employment and entrepreneurship ([Khan, 2015](#)). Women’s empowerment is an effort to achieve equal roles, access and control between women and men in all areas of socio-economic development ([Purnamawati & Yuniarta, 2020](#)). Entrepreneurship is recognized as a factor of economic development through the possibility of creating new jobs, higher incomes, and alleviating poverty. Women entrepreneurs make a significant contribution to national economies through participation in start-ups and growth in small and medium enterprises ([Ogidi, 2014](#)). But, regardless of their significant participation in economic life through entrepreneurship, they still do not have the same access to financial and other resources.

That is why the promotion and development of female entrepreneurship should promote equal opportunities between women and men, as well as constantly strengthen their economic influence. The economic empowerment of women can be viewed, within the framework of economic empowerment, in 4 levels:

1. Agency (pursuing one’s interests as well as access to funds, services and support),
2. Institutional environment, norms, statuses (access to the social and physical environment, through rights and use of assets and services),
3. Social relations, networks and influences (competitions, negotiations, decision-making, cooperation), and
4. Economic progress (assets, income, greater stimulation) ([Wu, 2013](#)).

This clearly shows how complex and multidimensional the concept of economic empowerment of women is. This means that it is necessary to consider the interconnected aspects of a woman’s life (economic, family, normative), to see what changes have been achieved, how positive they are and how much they affect the changed gender image when it comes to entrepreneurship.

The potential of studying female entrepreneurship does not end there. Researching poverty as a multidimensional and global problem becomes the main priority in the goals of sustainable development, that is, the intention to reduce poverty as a phenomenon to zero in 2030. Applying gender equality does not diminish the importance of poverty for men, but emphasizes that it is perceived differently by women and that it is almost always synonymous with women. Entrepreneurship provides a new approach to fighting poverty and stimulating economic growth,

especially in developing countries (Purnamawati & Yuniarta, 2020). Many economies show economic growth thanks to the support of the micro sector. The contribution of women's micro and small businesses to the family and national economy is increasingly evident.

The research conducted by UN Women entitled: "Women's entrepreneurship in Serbia - 10 years later" showed that:

1. Today's female entrepreneurs are "new" entrepreneurs and they started their businesses during the last decade,
2. The profile of female entrepreneurs shows that they are now on average older, and more educated, and the business structure is more related to the sector of expert professional services,
3. These are still micro businesses related to urban areas,
4. Today's female entrepreneurs are in a smaller percentage married and rarely have minor children, and
5. Today's female entrepreneurs are entrepreneurs of "chance", not necessity (UN Women, 2023).

4. FEMALE ENTREPRENEURSHIP IN GREEN SECTORS-EXAMPLE OF SERBIA

In the past ten years, there has been a kind of strengthening of female entrepreneurship in the Republic of Serbia (UN Women, 2023). In this regard, the total participation (compared to 2011) in total entrepreneurship increased to 31.2%. Looking at the regions, the participation of women entrepreneurs in Belgrade is about 31.7%, in Vojvodina 30.9%, in Šumadija and Western Serbia about 30.2% and in Southern and Eastern Serbia about 29.9%. A pronounced dynamic has been observed in terms of a large number of businesses that are founded and soon shut down, with a greater presence of women's companies in the sector of professional, scientific, innovative and technical activities. Also, the analysis indicated that micro and small enterprises are the most represented. The largest part of female entrepreneurs (69.2%) operate in the local market, which usually refers to the municipality and/or district where the company is located. About 13.8% of female entrepreneurs also operate on the regional market, while 5.7% operate on the international market (of which 2.7% is the EU market, 3.9% is the EU market, and the rest is made up of other countries).

There is no exact data on the number of women's businesses in the green sector in Serbia, but there are numerous examples of good practices. Women's green entrepreneurship is represented in various sectors. Namely, in the sector of eco products, the brands *Ecoserein* and *Eco.s* stood out, because their operations contribute to the reduction of plastic waste in Serbia. *Ecoserein* manufactures toothbrushes and hairbrushes using bamboo as an input instead of plastic. On the other hand, *Eco.s* produces thermal water bottles that can be used for a long time and repeatedly, and completely replace the dominant use of conventional plastic. In Serbia, there are ecological companies that combine entrepreneurial activities, which achieves (circular) industrial symbiosis and a kind of synergy. Joint initiatives lead to the so-called positive domino effect and have multiple benefits for society as a whole. In particular, the *Kristalni vuk* brand exclusively sells products in eco-packaging made from recycled materials. In this regard, the mentioned brand established cooperation with the company *Naša kuća*, which is known for creating unique paper from recycled cigarette packs. The aforementioned eco-producers use social networks and advertising platforms, which additionally contribute to the diffusion of ideas and consumer information.

Trends in the reduction of textile waste initiated the emergence of domestic slow fashion producers which are based on the zero-waste concept. In particular, *Cozy to wear*, *Vale Dsgn*, *Lagami* represent local brands that use natural and biodegradable materials in the creation of limited fashion series. In this way, the production of clothing items lowers the water and carbon footprint, but also pollution (through production and waste disposal) as well as other environmental externalities in the form of effects on human health. In the coming period, one of the ideas with great potential is the conception of the *Re Ekko (2023)* platform, which aims to gather, connect and inform all local slow fashion companies and interested consumer groups. Also, an additional goal is to increase the visibility and reach of new eco-brands on the domestic market.

In addition to the mentioned small companies in the manufacturing and textile sector, in the analysis, we single out the company *Steel Impex (2023)*, which deals with the collection, storage, and treatment of non-hazardous waste (packaging, old car parts, plastic, electrical waste, metal). The company has a modern recycling center that operates exclusively based on renewable energy sources. In other words, *Steel Impex* represents a company that has effectively implemented the principles of circularity, resulting in raw materials or finished products for use: SBR rubber plates, rubber granules, PET flakes, copper and aluminum granules, etc.

Particularly interesting is that the management structure of the company is made up of women. As the company exports products to the European market, it contributes to GDP growth and strengthens the competitiveness of the economy. The common characteristic of all the mentioned companies is that they also contribute to the growth of total employment, as an important determinant of economic performance and total production in the economy. Also, in addition to the economic effects, a reduction in gender equality, poverty and general inequality was observed as important social specificities and at the same time the goals of sustainable development.

5. CONCLUSION

The modern economic environment has contributed to the greater inclusion of women in economic processes and flows. The growing importance and presence of women in the business environment is also reflected in the strengthening of female entrepreneurship. In parallel, environmental degradation and global warming influenced the definition of the concept of green economy and the consequent development of green sectors and circular business models.

In the first part of the paper is given a definition, as well as various theoretical aspects of the concept of female entrepreneurship. Also, the specifics of green business and eco-products are presented in the analysis. Theoretical and analysis of examples from practice confirmed two initial premises of the research:

1. the development of female entrepreneurship affects the reduction of inequality and poverty in society, and
2. the strengthening of female entrepreneurship encourages the growth of innovative potential, as well as socio-economic development.

In the last 10 years, the participation of female entrepreneurs in Serbia has increased, and now it is around 30%. Bearing in mind the mentioned facts and conclusions, future steps should be defined in the coming years. First of all, it means: (*UN Women, 2023*).

1. creation of a framework for the registration and monitoring of companies owned by women,

2. providing financial and non-financial support for strengthening the capacity and potential of women's entrepreneurship through projects for co-financing, and thereby greater inclusion of companies in economic flows,
3. improving the business climate through permanent education and media promotion, which will additionally motivate the emergence of new businesses managed by women, and
4. networking and connection of female companies belonging to different sectors and branches, to achieve synergistic effects (growth of overall productivity and efficiency) in the economy.

A greater number of female enterprises in the environmental sectors can encourage the improvement of economic performance through increased employment, higher exports and total GDP. A better competitive ranking affects the optimal position of the economy on the global market. Also, the strengthening of female entrepreneurship in the green segment contributes to the achievement of important social goals in the form of reducing gender equality, poverty and general inequality. In other words, female green companies are an important link in the realization of the primary principles of sustainable development.

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What Do We Know about Albanian Women Entrepreneurs: Challenges and Opportunities

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Abstract: *Women entrepreneurs contribute considerably to the economy and business environment. However, they often have to cope with challenges in running an enterprise. This study aims to analyze the primary motivation that inspires women to establish their businesses as well as challenges and opportunities. The methodology relies on secondary resources analyzing Albanian entrepreneurs. Findings show an increasing number of Albanian women entrepreneurs who decide to create successful businesses. However, they must cope with different challenges and barriers. Another critical finding is linked to the opportunities that derive from running a business, concluding that despite the various difficulties women entrepreneurs face, they are successful in the business world. This study offers an essential contribution to enlarging the literature on women entrepreneurs.*

1. INTRODUCTION

Women entrepreneurs, constituting an important force in contemporary economies, have emerged as key contributors to economic growth and innovation (Aman et al., 2022; Crittenden & Bliton, 2019; Ghosh, 2022; Jha & Alam, 2022; Pavlović et al., 2022). Despite their impactful presence, women-led businesses often grapple with a myriad of challenges, intricately woven into the fabric of the entrepreneurial landscape (Cheraghi, 2013; Hussain et al., 2023; Kajtazi, 2021; Sadrnabavi & Daneshvar, 2022). This study focuses on a comprehensive exploration of the motivations, challenges, and opportunities encountered by women entrepreneurs in Albania, shedding light on a sector that is both vibrant and confronted with unique hurdles.

This research analyzes the significance of women entrepreneurs within the broader economic context. Acknowledging their important role in fostering innovation, creating employment, and catalyzing economic development, this study underlines the necessity of understanding the intricacies of their entrepreneurial journey. It also highlights the societal and economic benefits that emanate from empowering women to take on leadership roles in the business realm.

With the growing recognition of the important role women entrepreneurs play (Aman et al., 2022; Crittenden & Bliton, 2019; Ghosh, 2022; Pavlović et al., 2022), it becomes important to focus on the specific motivations driving Albanian women to enter the entrepreneurial sphere. Moreover, this study aims to explore the challenges and opportunities; it seeks to unravel the underlying factors that propel women to become architects of their economic destinies.

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This study highlights the broader significance of the topic in both academic and practical realms. In the academic sphere, it aims to contribute to the existing body of knowledge on women entrepreneurs, particularly in the context of Albania. Moreover, the practical implications of this study are underscored, emphasizing its potential to inform policies and interventions that can empower and uplift women in their entrepreneurial pursuits.

2. LITERATURE REVIEW

The entrepreneurial journey of Albanian women is linked to the sociocultural dimension of the nation, reflecting a rich history and cultural nuances that shape their experiences (BiznesAlbania, 2017; Blau & Janssen, 2020; Countries & Taxation, 2018; International Labour Organization, 2023; Pavlović et al., 2022; Rama et al., 2018; The World Bank, 2021). Understanding these sociocultural influences provides a comprehension of the motivations, challenges, and opportunities encountered by women entrepreneurs in Albania.

Sociocultural influences manifest in the day-to-day business practices of Albanian women entrepreneurs. From customer interactions to negotiation styles, cultural norms guide entrepreneurial behavior. Perceptions of women in business are molded by societal attitudes deeply rooted in cultural norms. Cultural capital, encompassing knowledge, values, and social connections, plays a pivotal role in shaping entrepreneurial identity (Icka et al., 2021; The World Bank, 2021).

Sociocultural influences present both challenges and opportunities for women entrepreneurs (Challa & Khalid Perwez, 2023; Kajtazi, 2021; Nayak et al., 2023; Sadrnabavi & Daneshvar, 2022). The opportunities for leveraging cultural heritage are considered a competitive advantage, tapping into niche markets, and contributing to the preservation of cultural identity through entrepreneurial endeavors (Chitac, 2023; Fallah & Soori, 2023; Kawamorita et al., 2021; Nayak et al., 2023). Moreover, education, exposure to global perspectives, and changing societal attitudes impact shaping a new way of women-led businesses (Aman et al., 2022; Crittenden & Bliton, 2019; Pavlović et al., 2022; Rao, 2014). Understanding these dynamics is integral to forecasting the trajectory of women's entrepreneurship in Albania.

Within the context of Albanian families, gender roles and expectations traditionally assign distinct responsibilities to women. Moreover, women entrepreneurs often face barriers in terms of creating a balance between their roles within the family unit and the demands of business ownership. For instance, they face challenges and perceive successes as to reconcile familial obligations with entrepreneurial pursuits (Kawamorita et al., 2021; Rudhumbu et al., 2020; Sadrnabavi & Daneshvar, 2022; Sallah & Caesar, 2020).

Familial expectations often play a pivotal role in shaping the choices women make regarding entrepreneurship. For instance, the expectations from parents, spouses, and extended family members influence women's decisions to enter business ventures (Ghosh, 2022; Nayak et al., 2023; Pavlović et al., 2022). Familial support or resistance impacts on the entrepreneurial trajectory of women in Albania.

As societal norms evolve, generational shifts in family dynamics become pronounced. Younger generations of women entrepreneurs play an important role in changing family structures and expectations. For instance, education, exposure to diverse perspectives, and altered societal

attitudes play an important role in shaping a new narrative where women entrepreneurs may encounter different familial dynamics (Polas et al., 2022; Rudhumbu et al., 2020).

Family, as a support structure, can be a source of strength or a potential hurdle for women entrepreneurs. The familial support influence in fostering entrepreneurship, including emotional encouragement, financial backing, and shared responsibilities. Moreover, positive family dynamics can become a catalyst for women's success in business (Nallasamy et al., 2023; Sallah & Caesar, 2020).

Traditional gender roles can pose challenges for women seeking to break into non-traditional domains such as entrepreneurship. For instance, ingrained gender expectations may limit the perceived appropriateness of women engaging in business ventures (Chitac, 2023; Kawamorita et al., 2021).

Entrepreneurial pursuits often extend beyond individual aspirations to encompass a broader familial and cultural impact. For instance, women entrepreneurs contribute to the entrepreneurial legacy within their families, inspiring future generations (Cheraghi, 2013; Hussain et al., 2023).

Achieving work-life integration is a constant negotiation for women entrepreneurs in Albania. For instance, women navigate the need for flexibility in their professional pursuits while fulfilling familial obligations. Moreover, entrepreneurship plays an important role in providing opportunities for flexible work arrangements that accommodate familial responsibilities (Icka et al., 2021; Pavlović et al., 2022; Rao, 2014; The World Bank, 2021).

The intersectionality of identity, encompassing factors such as age, marital status, and educational background, influences how women entrepreneurs navigate familial expectations. Moreover, these intersecting identities shape the entrepreneurial experiences of women, emphasizing the need for nuanced approaches to understanding their diverse challenges and opportunities (Aman et al., 2022; Ghosh, 2022; Nixdorff & Rosen, 2010; Pavlović et al., 2022; Rao, 2014).

3. METHODOLOGY

The methodology section outlines the approach employed to investigate the motivations, challenges, and opportunities of Albanian women entrepreneurs. Emphasizing transparency and rigor, this section elucidates the rationale behind the chosen methodology and provides a clear roadmap for data collection and analysis.

This study adopts a qualitative research design, leveraging secondary resources to gain insights into the experiences of Albanian women entrepreneurs. This design is deemed appropriate for capturing the depth and nuances of the entrepreneurial landscape, allowing for a comprehensive analysis of diverse perspectives.

The primary data sources for this study include scholarly articles, reports, and case studies pertaining to women entrepreneurship in Albania. A systematic review of academic databases, industry reports, and reputable publications forms the bedrock of data collection. This approach ensures an inclusive representation of the experiences of Albanian women entrepreneurs over time.

To ensure the relevance and reliability of the selected resources, a meticulous set of criteria is applied. Only studies focusing explicitly on Albanian women entrepreneurs are included, with a preference for those employing rigorous research methodologies. The selection criteria also

consider the recency and diversity of the sources to capture the evolving nature of the entrepreneurial landscape.

The collected data undergoes a systematic analysis to distill key themes and patterns. Thematic analysis is employed to identify recurrent motifs related to motivations, challenges, and opportunities. This process involves coding and categorizing data, enabling the extraction of meaningful insights from a diverse range of sources.

4. FINDINGS

The findings of this study are derived from a comprehensive analysis of secondary resources focusing on Albanian women entrepreneurs. The synthesis of diverse sources has revealed crucial insights into the motivations, challenges, and opportunities that define the entrepreneurial landscape for women in Albania.

A notable finding is the upward trajectory in the number of Albanian women entrepreneurs. Despite the challenges, the entrepreneurial spirit among Albanian women is on the rise. This finding challenges traditional gender norms and reflects the evolving dynamics of women's participation in the business realm in Albania.

This study identifies a myriad of motivations driving Albanian women to pursue entrepreneurship. Economic independence, passion for specific industries, a desire for autonomy, and a commitment to societal impact emerge as prominent motivators. These motivations often interconnected, paint a rich tapestry of the diverse reasons that propel women to establish and lead businesses in Albania.

The research underscores the persistence of challenges faced by Albanian women entrepreneurs. Limited access to financial resources, gender bias, balancing work and family responsibilities, and cultural and institutional barriers remain significant impediments. These challenges, though formidable, highlight the resilience and determination exhibited by women in navigating the complexities of entrepreneurship.

A crucial finding is the resilience and success of Albanian women entrepreneurs in the face of adversity. Despite encountering multifaceted challenges, many women have succeeded in establishing and sustaining businesses. This resilience not only speaks to individual triumphs but also contributes to a growing narrative of women's success in the Albanian business landscape.

This study identifies a spectrum of opportunities that arise from entrepreneurship for Albanian women. These opportunities encompass economic empowerment, enhanced skill development, empowerment to challenge traditional gender roles, community development, networking possibilities, innovation, access to international markets, and advocacy for policy change. The multifaceted nature of these opportunities underlines the transformative impact that entrepreneurship can have on both individual women and the broader societal fabric.

A critical finding emphasizes the necessity for supportive ecosystems that facilitate the growth of women-led businesses. This study underscores the importance of addressing challenges through targeted interventions, including financial support mechanisms, mentorship programs,

networking initiatives, and policy reforms. These findings underscore the potential for positive change when comprehensive support structures are in place.

This study contributes significantly to the literature on women entrepreneurs, particularly in the Albanian context. The findings offer a nuanced understanding of the motivations, challenges, and opportunities specific to Albanian women, bridging gaps in existing research and paving the way for a more comprehensive exploration of women's entrepreneurship in diverse global contexts.

In sum, the findings of this study provide a rich tapestry of the experiences of Albanian women entrepreneurs. The nuanced understanding gained from these findings not only contributes to academic discourse but also offers practical insights for policymakers, business leaders, and support organizations aiming to foster a more inclusive and supportive entrepreneurial ecosystem for women in Albania.

5. DISCUSSION

The discussion section synthesizes the key findings and places them within a broader context, providing insights into the implications, nuances, and potential pathways for addressing the challenges and leveraging the opportunities identified in this study of Albanian women entrepreneurs.

The diverse motivations identified among Albanian women entrepreneurs underscore the complexity of their entrepreneurial journeys. The discussion delves into the interconnected nature of these motivations, recognizing that economic independence is often intertwined with a passion for societal impact and a desire for autonomy. Understanding these nuances is crucial for crafting targeted support programs that align with the multifaceted motivations driving women to entrepreneurship.

The persistent challenges faced by Albanian women entrepreneurs do not overshadow their resilience. The discussion highlights specific case studies and success stories that exemplify how women have navigated and overcome barriers. This resilience not only challenges prevailing gender norms but also serves as a foundation for advocating systemic changes that can alleviate the challenges faced by women entrepreneurs.

The discussion underscores the transformative potential of the identified opportunities arising from entrepreneurship. Economic empowerment, skill development, and community impact are not only individual gains but also catalysts for broader societal change. The discussion explores how these opportunities can be maximized to foster a more inclusive and dynamic entrepreneurial landscape in Albania.

Addressing the challenges faced by Albanian women entrepreneurs necessitates the establishment of supportive ecosystems. The discussion critically evaluates existing support structures and advocates for targeted interventions, including financial initiatives, mentorship programs, and policy reforms. It emphasizes the need for collaborative efforts among government bodies, NGOs, and the private sector to create an environment conducive to the growth of women-led businesses.

The discussion acknowledges the intersectionality of challenges faced by Albanian women entrepreneurs. Factors such as age, education, and geographic location can intersect with gender,

influencing the entrepreneurial experience. Recognizing these intersectionalities is essential for designing inclusive policies and programs that cater to the diverse needs of women across different contexts and backgrounds.

The findings indicate a shifting narrative in Albanian society concerning women's roles in entrepreneurship. The discussion explores how successful women entrepreneurs can contribute to changing societal perceptions, challenging gender stereotypes, and inspiring the next generation of women leaders. It emphasizes the importance of storytelling and representation in reshaping cultural narratives surrounding women in business.

The discussion serves as a launching pad for identifying avenues for future research and advocacy. It proposes potential areas of inquiry, such as a more in-depth exploration of the intersectional experiences of women entrepreneurs, longitudinal studies tracking the impact of support programs, and analyses of the evolving policy landscape. The discussion encourages researchers, policymakers, and practitioners to build on the current study's foundation for a more comprehensive understanding of women's entrepreneurship in Albania.

In conclusion, the discussion synthesizes the intricate web of motivations, challenges, and opportunities inherent in the entrepreneurial journeys of Albanian women. It goes beyond the identification of factors to provide a roadmap for leveraging opportunities, overcoming challenges, and fostering a more inclusive and supportive environment for women entrepreneurs in Albania. The insights gained from this discussion contribute to both academic discourse and practical initiatives aimed at advancing the status of women in the entrepreneurial landscape.

6. CONCLUSION

The comprehensive analysis of motivations, challenges, and opportunities among Albanian women entrepreneurs has illuminated a dynamic and evolving landscape. Several key insights emerge from this study, providing a foundation for understanding the current state of women's entrepreneurship in Albania and shaping future initiatives.

This study affirms that Albanian women entrepreneurs are making significant strides, establishing businesses, and contributing to economic growth. However, these triumphs are not isolated from the challenges that persist, and the entrepreneurial journey for women remains marked by resilience, determination, and the negotiation of multifaceted obstacles.

The motivations driving Albanian women entrepreneurs, encompassing economic independence, passion for specific industries, and a commitment to societal impact, are identified as powerful catalysts for entrepreneurial growth. Recognizing and leveraging these motivations can fuel the expansion of women-led businesses, fostering a more dynamic and diverse entrepreneurial ecosystem.

The findings underscore the critical need for supportive ecosystems that address the unique challenges faced by Albanian women entrepreneurs. This includes targeted financial initiatives, mentorship programs, networking opportunities, and policy reforms aimed at dismantling gender biases. A supportive ecosystem is not only essential for individual success but also for cultivating an environment where women entrepreneurs can thrive collectively.

The identified opportunities arising from entrepreneurship have transformative potential. Economic empowerment, skill development, and societal impact are not only individual gains but also contributors to broader positive change. By capitalizing on these opportunities, Albanian women entrepreneurs can further amplify their influence and contribute to a more equitable and prosperous society.

Successful women entrepreneurs play a pivotal role in shaping cultural narratives surrounding gender roles and business leadership. This study suggests that their stories can challenge stereotypes, inspire future generations, and foster a more inclusive perception of women's capabilities in the entrepreneurial sphere. Recognizing and amplifying these narratives can be a powerful catalyst for societal change.

The conclusion emphasizes the need for continued research and advocacy to deepen our understanding of women's entrepreneurship in Albania. This includes exploring intersectional experiences, evaluating the long-term impact of support programs, and monitoring the evolving policy landscape. By prioritizing research and advocacy, stakeholders can contribute to informed decision-making and the development of evidence-based interventions.

In closing, this study not only adds valuable insights to the literature on women entrepreneurs but also serves as a call to action. The triumphs and challenges revealed in the entrepreneurial journeys of Albanian women underscore the urgency of creating an environment that nurtures their aspirations. Through concerted efforts in research, policy-making, and community support, we can cultivate an entrepreneurial landscape where Albanian women thrive, leaving an indelible mark on the economic and social fabric of the nation. imperative for sustainable growth and competitiveness.

This study highlights specific challenges faced by Albanian women entrepreneurs, indicating the need for gender-responsive policies. Policymakers can use these insights to formulate and implement initiatives that address financial inclusion, gender bias, and other barriers to create a more supportive business environment. Organizations supporting women entrepreneurs can tailor their programs based on the identified motivations, challenges, and opportunities. This may involve designing mentorship programs, skill development initiatives, and networking opportunities that align with the unique needs of Albanian women entrepreneurs.

Financial institutions can use the findings to refine their lending practices, ensuring they are gender-responsive. Creating targeted financial products and services that cater to the specific needs of women entrepreneurs can enhance their access to capital. Educational institutions and advocacy organizations can leverage this study's insights to design awareness campaigns that challenge gender stereotypes and promote the positive contributions of women entrepreneurs. These campaigns can foster a cultural shift and inspire more women to pursue entrepreneurship.

Future research should consider longitudinal studies to track the trajectories of women entrepreneurs over time. This approach can provide a deeper understanding of the sustainability of their ventures, the evolution of challenges, and the long-term impact of support programs. Research that delves into the intersectionality of women's experiences is essential. Examining how factors such as age, education, and geographic location intersect with gender can provide more nuanced insights into the diverse landscape of women entrepreneurs in Albania.

Further research should focus on assessing the impact of specific support programs and initiatives targeted at women entrepreneurs. Understanding the effectiveness of mentorship programs, financial incentives, and skill development initiatives can guide the refinement of existing programs. Given the increasing role of technology in business, future research can explore the digital entrepreneurship landscape among Albanian women. Investigating how women entrepreneurs adopt and leverage technology in their ventures can provide valuable insights into the evolving business landscape. Comparative studies that benchmark the experiences of Albanian women entrepreneurs against those in other countries or regions can contribute to a broader understanding of global best practices. This comparative analysis can highlight similarities, differences, and transferable lessons. Research focusing on the innovative capacities of women entrepreneurs can contribute to understanding the role of creativity and innovation in their business success. Exploring how women-led businesses contribute to innovation and economic growth can be an avenue for future investigation.

Collaborations between business and psychology disciplines can explore the psychosocial dimensions of women's entrepreneurship. Understanding the psychological factors that influence motivations, resilience, and decision-making can provide a more holistic perspective. Research that investigates the impact of entrepreneurship on the health and well-being of women can contribute to a comprehensive understanding. Exploring the potential stressors and coping mechanisms within the entrepreneurial journey can inform holistic support strategies. With a growing emphasis on sustainable business practices, future research can explore the contributions of women entrepreneurs to environmental sustainability.

Investigating the role of women in eco-friendly and socially responsible ventures can be a pertinent area of study. In summary, the implications outlined above suggest practical applications for policymakers, support organizations, and financial institutions, while also guiding future research endeavors to deepen our understanding of women's entrepreneurship in Albania and beyond.

This study provides some limitations. One limitation of this study lies in its focus on Albanian women entrepreneurs. While the findings offer valuable insights into the specific context of Albania, the extent to which the results can be generalized to women entrepreneurs in other cultural or geographic settings may be limited. The unique socio-cultural and economic conditions in Albania might shape the experiences of women entrepreneurs in ways that differ significantly from those in other regions. This study's methodology relies on secondary data sources, which might introduce limitations related to the availability, accuracy, and comprehensiveness of the information. The quality of the data is contingent upon the reliability of the sources consulted. Additionally, the absence of primary data collection methods, such as surveys or interviews, may limit the depth of understanding and the ability to capture the nuanced perspectives of Albanian women entrepreneurs. This study is bound by a specific knowledge cutoff date, and the findings are based on the entrepreneurial landscape up to that point. Changes in economic, social, or political conditions after the cutoff date may not be reflected in this study. This temporal constraint may limit this study's ability to capture emerging trends or shifts in the challenges and opportunities faced by Albanian women entrepreneurs in the most recent context.

It is essential to acknowledge these limitations to provide transparency and context for readers, researchers, and policymakers when interpreting this study's findings and considering the implications for future research and practical applications.

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The Students' Perception of Their Soft Skills in Serbia

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Abstract: *Today, in the dynamic business context, graduates have to be ready to deal with various business problems where different alternative solutions can be brought, but only one is optimal. It requires a set of competencies and soft skills such as critical and strategic thinking, problem-solving, communication and flexibility. The described situation mostly gives priority to various soft skills in relation to hard skills, i.e. professional knowledge acquired during the studies. The purpose of this research is to shed light on how soft skills are taught at the moment and how they should be taught in the future to prepare new employees to easily get their first job and reduce the rate of youth unemployment. This research aims to analyze how curricula at business universities prepare their students for the new demands of the labor market. For this aim, survey-based empirical research was realized on the student's perception of the importance of soft skills in the sample of 245 students of the Faculty of Economics in Subotica, University of Novi Sad, Serbia. Using Spearman's correlation, it was determined that there is a statistically significant negative relationship between the student's work experience during their studies and their perception of the studies preparing them for the new demands on the labor market. Therefore, students without work experience believe that their previous education has prepared them for the new demands of the employers, while students with work experience conclude that the competences acquired so far have not sufficiently prepared them for the new demands of the labor market. Today, it is more than necessary for students to acquire adequate skills beyond academic or professional knowledge. It is recommended to incorporate soft skills training into the hard skills courses in order to achieve an efficient and effective tertiary education for future employees.*

1. INTRODUCTION

Universities are institutions, which develop the human capital of a nation, as they are responsible not only for the simple training of students and preparing them for work but for their future personal and career development, too. The rapid changes in economic, social, political and technological environment mean a constant challenge for higher education. The Industrial Revolution 4.0 requires highly competent human resources, this is why universities have to develop study programs that prepare students for the changing contexts and complex expectations of the global labor market.

According to [Kember et al. \(2007\)](#), there is an increasing recognition for awareness that soft skills can support scholars to achieve academic and job-related aims upon their graduation. This is why soft skills training has a crucial role in education. [Tang \(2019\)](#) underlines that higher educational institutions are grounds where scholars get their socialization and develop a variety of knowledge, skills, attitudes, and characteristics that shake the manner they act in a broader

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society. The significance of soft skills depends on the dimensions of organizational and national culture. Nowadays the process of globalization and digitalization require the cooperation of employers from different countries and cultures.

Guerra-Báez (2019) considers that a dynamic business environment requires employees a set of competencies and soft skills such as critical and strategic thinking, problem-solving, communication, and flexibility. In the era of „war for talents” the candidates’ knowledge and skills are deciding factors in the talent acquisition processes. Universities have an important role in the improvement of the employability of their students – developing not only their knowledge and professional-technical skills but soft skills, too.

The purpose of this research is to shed light on soft skills development in Serbia. This research aims to present the results of questionnaire-based research on the student’s perception of the importance of their soft skills in Serbia on the sample of 245 students of the Faculty of Economics in Subotica, University of Novi Sad, Republic of Serbia.

2. THEORETICAL BACKGROUND

It is well known that knowledge may be divided into hard skills and soft skills. Asbari et al. (2020) emphasize that hard skills can produce something visible, explicit and direct, they can be assessed from technical or practical tests. Escolà-Gascón and Gallifa (2022) stress that hard skills are technical competencies specific to a particular discipline or field of work. Hard skills facilitate the successful performance of academic and professional tasks. In the field of tertiary education, hard skills are mainly limited to the development and acquisition of formal learning.

Concerning soft skills, Escolà-Gascón and Gallifa (2022) underline that soft skills represent psychological attributes that express how people learn, think, and act. The evaluation of soft skills is needed as they allow to anticipate the students’ professional future and career orientation. Asbari et al. (2020) consider that soft skills form the knowledge that is still in the minds of humans and is highly personal so transformation requires personal interaction.

Edeigba (2022) emphasizes that despite the rising awareness of universities and students about the importance of soft skills there is a significant gap between the students’ soft skills and the employers’ expectations about soft skills. The differences in skills acquired from universities and the expectations of employers is known as the “expectation gap”. The expectation gap is becoming wider because of the rapid changes in the employer’s expectations and the impossibility of tertiary education institutions to incorporate these requirements rapidly in the study programs. For example, in Serbia, the accreditation process of a study program lasts from one to two years and after finishing the entire process, accreditation is obtained for seven years. In this period – from the preparation of the accreditation documentation and the process of confirmation - a lot of serious changes may have happened in the labor market. This kind of bureaucratic accreditation process slows down and makes almost impossible the urgent innovation of study programs according to business market needs. Schulz (2008) underlines that employers, like professors, complain the most about the lack of soft skills of university graduates. The most missed soft skills are communication skills, business knowledge, and project management skills.

Guerra-Báez (2019) considers that promoting the soft skills of university students is a win-win situation. The students benefit from personal training; the universities benefit from providing

real comprehensive training, the community benefits because it is served by professionals, while students benefit as their transversal skills are improved. It is important to highlight that the development of soft skills requires from universities some kind of fieldwork with communities and families close to the educational environment. Another basic pillar of soft skills development is interdisciplinary as it is believed that it is not the task of educators alone but the responsibility of psychologists, counselors, and other actors involved in the teaching and learning process. The third pillar is considering the cost of students' integral training as an investment where there is no loss.

Guerra-Báez (2019) thinks that university lecturers have a special responsibility regarding soft skills because, during students' studies, lecturers have a significant impact on the development of students' soft skills. Lecturers should be active and practice various soft skills with their students. One of the most effective and efficient ways of soft skills development is to include soft skills training in the teaching of hard skills. The advantage of it may be found as more attractive courses and a better success rate of learners. Besides, students have to be very active in this process, too, to experience their capabilities, strengths and weaknesses concerning soft skills. There are different approaches to soft skills development, like role-plays or classroom debates. The literature review shows that the main strategies used to develop soft skills in tertiary education combine different activities linked to the curriculum that allows practical application.

Schulz (2008) considers that a formal approach to the development of soft skills at universities may mean incorporating soft skills subjects into a study program's curriculum. On lower levels, a course may require from students some kind of study and the presentation of their results to the other students. At the graduate level, it will be valuable to incorporate communication skills, time management skills, conflict management, and other cultural skills development into every management course. However, very often the curricula are overloaded with hard skills courses, and it is unworkable to add or substitute courses. A practical way of offering soft skills training is to incorporate them into the hard skills courses. This way, there is no need to change the curriculum, only the teaching methodology, which at the same time requires a significant re-thinking and re-planning of hard skill courses.

Author **Tang (2019)** considers that four basic questions should be answered while lecturers are designing activities for their courses. The four questions include (1) the purpose of this activity and its importance, (2) what kinds of soft skills are developed through the teaching activity, (3) the used methods for that, and (4) the competences students can apply in their work. Focusing on the methods of developing soft skills Tang suggests that employment-related skills, like critical thinking or verbal and non-verbal communication, may be developed through role-plays or other interactive methods. Team-working skills can be developed in group work activities. Other soft skills can be taught in weekly teaching courses, university internship programs, or through coaching and mentoring activities offered at universities. The university advisory boards shall welcome practitioners who can evaluate the teaching program and the skills of the graduates. To enhance graduate employability, faculty should include externships, too, to develop scholars' professional experiences.

Sretenović et al. (2022) stress that in the last few decades, companies in Serbia – like other organizations worldwide - have had to face constant challenges, such as globalization, competition, and IT technologies. Companies need competent and talented employees who have soft skills that will help them to adapt to the changing business context. Research conducted by

Babić and Slavković (2021) in 2011 in Serbia showed that enthusiasm, teamwork, flexibility, and communication skills are the highly ranked soft skills that managers from all sectors expect from their employees.

The research of Milić et al. (2023) on the perception of engineering students in Serbia has shown that when it comes to the importance of various soft skills needed for future careers, students rated teamwork and communication skills as the most important, and creativity and leadership as the least important soft skills. When students rated their levels of soft skills, problem-solving and flexibility/adaptability were rated with the highest scores, while presentation skills and stress management were ranked lowest. The results show that students are becoming more aware of the importance of non-technical skills. However, there is still a gap between the importance level of skills needed for future work and the level of student's self-assessment of soft skills. The results suggest that educational institutions, professors, students and companies have to cooperate to succeed and develop students' hard and soft skills.

3. RESEARCH METHODOLOGY

In order to analyze the students' current perception of their soft skills a questionnaire-based field research was conducted on the importance of students' soft skills. The questionnaire was filled out by the students of the Faculty of Economics in Subotica, University of Novi Sad, Serbia. The online anonymous questionnaire was filled out by university students of all levels (bachelor, master, and PhD students) from October 2022 till January 2023. The total number of respondents was 245. The research focused on students' perception of the most important soft skills and their opinion on how important is university in developing soft skills. The research hypothesis is as follows:

Ho: There is a negative relationship between the students' work experience and their perception that their previous education prepares them for new demands in the labor market.

Figures 1, 2, and 3 show the respondents' demographic data, while Figure 4 presents the respondents' structure based on their work experience.

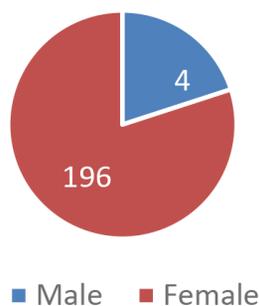


Figure 1. Sample structure regarding respondents' gender

Source: Own research

The majority of the respondents (about 80%) were female, and it mainly represents the students' structure at the Faculty of Economics in Subotica, University of Novi Sad, as the majority of students are female.

Figure 2 presents the respondents' structure due to their age.

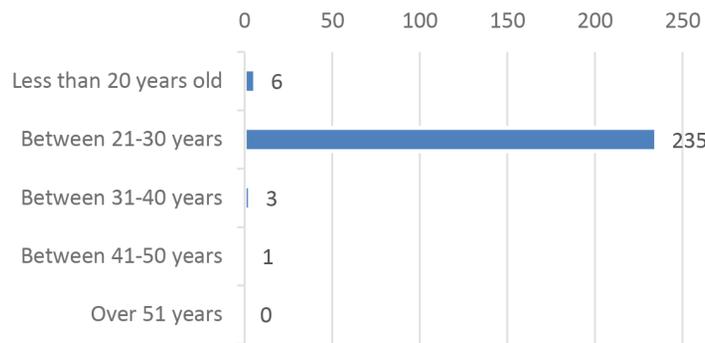


Figure 2. Sample structure regarding respondents' age

Source: Own research

The respondents' age distribution shows that the great majority (96%) of respondents is between 21 and 29 years.

Figure 3 gives an insight into the respondents' highest qualification.

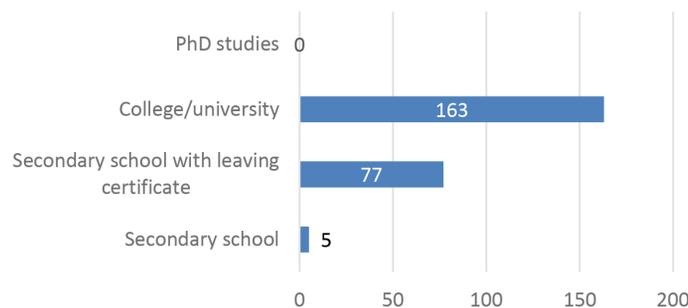


Figure 3. Sample structure concerning respondents' highest qualification

Source: Own research

Two-thirds (66%) of the interviewees are master's students, with college or university education, while one-third of respondents are undergraduate students. This structure does not represent the faculty's students, as the majority are undergraduate students.

Figure 4 shows the structure of respondents based on the length of their work experience.

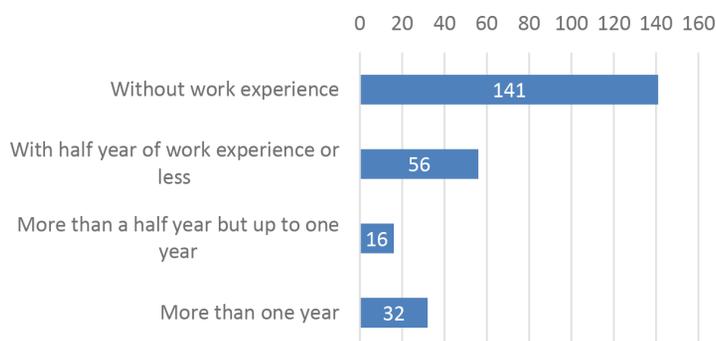


Figure 4. Sample structure concerning respondents' work experience

Source: Own research

The majority (58%) of analyzed students have no work experience, while about 23% of them have worked for a period between half a year and one year.

4. RESULTS AND DISCUSSION

First, the interviewees were asked to identify the most important soft skills the employers expect from a candidate with a university education and to value how they meet these requirements concerning the soft skills. A five-point Likert scale was used to document the answers. Table 1 presents the students' perception of the ten most important skills employers expect from university graduates and their perception of how they meet these expectations. The means and the standard deviation data are presented.

Table 1. The respondents' perceptions about the most important soft skills

The most important skills	Students' perception of employers' expectations from candidates with tertiary education		Students' perceptions of the level of their soft skills	
	Mean (1-5)	Stand. dev.	Mean (1-5)	Stand. dev.
Communication skills	4.48	0,808	4.28	0,761
Good communication skills	4.48	0,771	4.38	0,793
Language skills	4.46	0,765	3.77	0,990
Ability to work in team	4.40	0,832	4.29	0,878
Planning and organizational skills	4.40	0,775	4.27	0,790
Problem solving	4.38	0,838	4.04	0,836
Flexibility	4.34	0,851	4.26	0,808
Presentation skills	4.32	0,767	3.96	1,022
Creativity	4.27	0,873	4.01	0,943
Time management	4.26	0,822	4.02	0,936

Note: (1- not important at all 5-the most important)

Source: Own research

According to the obtained data students consider that employers expect from university graduates the following skills: communication skills, language skills, teamwork, planning and problem solving, flexibility and creativity. Based on the students' self-evaluation they have the highest level of communication skills, teamwork skills, planning and organization skills and flexibility. The students consider that they have lower levels of language skills and presentation skills. Students assume that they meet their employers' requirements the best concerning their ability to work in teams, group communication skills and flexibility.

Table 2. presents the data on respondents' opinions about the importance of soft skills and how education develops soft skills.

Table 2. The respondents' perceptions of the importance and development of soft skills

Statements about soft skills	Students' agreement (1-5)
Soft skills are more important in today's labor market than technical skills	4,09
Soft skills can be learned at school	3,08
Education prepares students for the challenges of the labor market.	3,09

Note: (1- not important at all 5-the most important)

Source: Own research

Students consider that for employability soft skills are very important - equally or more than hard skills – but do not think that soft skills can be learned at school and education fully prepares them for work.

Table 3 shows the testing of the hypothesis.

Table 3. Hypothesis testing

Correlations			WE	Pre
Spearman's rho	Work experience	Correlation Coefficient	1.000	-.129*
		Sig. (2-tailed)	.	.044
		N	245	245
	Preparation for new demand on the labor market	Correlation Coefficient	-.129*	1.000
		Sig. (2-tailed)	.044	.
		N	245	245

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

Source: Own calculation

Using Spearman's correlation, it was determined that there is a statistically significant negative relationship between the student's work experience during their studies and their perception of the studies preparing them for the new demands of the labor market. The hypothesis H_0 has been proved. Therefore, students without work experience believe that their previous education has prepared them for the demands of the employers, while students with work experience conclude that the competences acquired at university have not sufficiently prepared them for the demands of the labor market.

5. FUTURE RESEARCH DIRECTIONS

Future research directions aim to analyze the students' perception of soft skills at other faculties and universities in Serbia. Besides, an international comparison may be very valuable – based on standardized international empirical research. It may point out the importance of national culture and the effect of economic and social environment to the perception of students.

The other direction of the development of this research is to focus on employers and analyze their perception of the soft skills of graduate students, and their newly employed workforce. It is even more important as the development of soft skills at universities without feedback from society, the labor market and employers do not improve the employability of students.

6. CONCLUSION

The Industrial Revolution 4.0 requires highly competent employees who have professional competences and soft skills to successfully cooperate in the global business context. The development of soft skills during a formal tertiary education is challenging as soft skills form the knowledge that is in the minds of humans and is highly personal so transformation requires personal interaction. A more efficient way of offering soft skills training to students is to embed it into the teaching of hard skills. However, it may be reflected in the lecturers' teaching methodology requiring some re-thinking and redesigning of existing hard-skill courses.

The results of the research on the students' perception of the importance and development of soft skills in Serbia (Faculty of Economics Subotica – University of Novi Sad) show that students consider that employers expect from university graduates the following skills: communication skills, language skills, teamwork, planning and problem solving, flexibility and creativity. Students consider that soft skills may be only partially learned at universities. There is a statistically significant negative relationship between the student's work experience and their perception that previous education has prepared them for the demands of the labor market. Based on the above it may be concluded that the importance of tertiary education in developing soft skills in Serbia is moderate.

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Possible Directions for Innovations in Tourism

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Abstract: *In the tourism sector, the transfer of innovations from other sectors is usually observed, as innovative solutions are modified for the purposes of tourism activities. The main types of innovations in the tourism organization can be considered according to the goal they pursue, namely the achievement of economic or social efficiency.*

The purpose of the current development is to present the possibilities for implementing innovations in the tourism sector. In order to achieve the set goal, the innovation trajectory by which the tourist enterprise implements innovations in its activity will be examined. Based on the considered trajectory and outlined specificity in the innovation activity of tourist enterprises, the four main groups will be clarified: technical-technological innovations, product innovations, marketing innovations and organizational innovations. Real examples of implemented innovations in the tourism sector will be explored and presented.

1. INTRODUCTION

European and world experience shows that the skillful use of scientific research and modern technologies and innovations make it possible to take active actions to increase the competitiveness and efficiency of enterprises. A major challenge is the transition to organizing business based on knowledge and the inclusion of tourism enterprises in the global information society.

The ability to create and innovate plays an important role in the prosperity of the individual tourism enterprise, the industry and the economy as a whole. The implementation of innovations is a determining factor for increasing competitiveness and efficiency, first of the tourist enterprise, then of the industry and, respectively, of the economy. The requirements of the European Union in the field of tourism and the development prospects for national tourism are expressed above all in the quality of the tourist product and the way of providing tourist services.

In the tourism sector, the transfer of innovations from other sectors is usually observed, as innovative solutions are modified for tourism activities. In addition to the diffusion of innovations, the innovative activity of tourist organizations is also related to the creation of new products, the implementation of new business processes, the application of new ideas for organizing the service, improving the technologies used in the service process, finding new markets, attracting of new customers, etc., which lead to a positive effect for the tourism sector.

The innovation activity of the tourist enterprise is a specific and relatively continuous dynamic process related to the implementation of new or improvement of existing products, techniques, technology, materials, organization and structure, to expand its potential. Innovation activity in tourism is a set of interrelated actions on the implementation, management and control of innovations. The process of introducing something completely new to the organization - product,

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service, organization, or otherwise - is only one part of innovation management. It includes complex management functions such as research, forecasting, strategy making, idea generation and selection, concept development, organizing, coordinating and controlling.

The relevance and significance of the development find expression in the realized need to study the observed transformations in the tourism industry to which effective management practices lead to innovations in tourism. The purpose of the current development is to present the possibilities for implementing innovations in the tourism sector. In order to achieve the set goal, the innovation trajectory by which the tourist enterprise implements innovations in its activity will be examined.

2. THEORETICAL VIEWS ON TOURISM INNOVATION

Schumpeter's (1934) views on innovation are followed by the neo-Schumpeter economic school, developed by scientists such as Freeman (1991). After Schumpeter, researchers of innovation in the economic literature consider innovation as an economic lever in enterprises, and hence in the economic branches of countries. According to them, the innovation should increase the value of the consumer or the value of the producer. The goal of innovation is the positive change that will improve currently existing products, services, markets, etc.

Schumpeter and his followers consider innovations in direct connection with the concept of "invention" - understood as a general concept of "invention", "discovery", "new solution", "new idea". Inventions are significant developments without a previously specified use in a specific industry or sector.

For example, in P. Rumer's theory of entrepreneurship, innovation is "the new element (node) introduced into the economic system, which changes, immediately, the costs of the transaction for both parties." (Cabral, 1998) Again from the perspective of entrepreneurship, Drucker (2002, p. 26) defines innovation as a specific tool of entrepreneurs, a means by which they exploit change as an opportunity in a business or service.

That is, from the point of view of entrepreneurship, innovation is the adoption of a new product line, based on a specially developed original technology, which allows to offer to the market a product that satisfies consumer needs unsatisfied by existing products. Or to put it another way, an innovation is an object implemented in production, which is the final result of conducted scientific and technological research or discoveries.

As part of the enterprise's marketing mix, innovation falls under the purview of famous marketing theorists such as Kotler (2002, p. 306), Pride and Ferrell (1996, p. 133). From a marketing point of view, innovations are part of the company's commodity policy and are related to the market realization of new products, technologies, and customer relations. According to these authors, innovation is a means used by the enterprise in the management of its product line, by which it reacts, both in terms of emerging new needs from consumers and in terms of products offered by competitors in the market.

Innovation is most often defined as a change aimed at renewing or introducing something new and useful in practice, and it is possible to do this in various fields: business, society, politics, science, art, etc. Complementing and modernizing the notion of innovation is the Technological Concept of Innovation of the Oslo Manual (OECD/Eurostat, 2018), which links product and

process innovation with research and technology transfer. According to the definition in the Handbook, innovations are the end result of an innovation activity, expressed in a new or improved product realized on the market, a new or improved technological process used in practice, or new approaches for social services.

In international standards (ISO, 2019), innovation is described as “the end result of the innovation activity, embodied in the form of a new or improved product introduced on the market, a new or improved technological process used in practical activity, or a new approach”. The tourism sector, as a part of the service sector, is dependent on the development of all branches, as it appears “consumer” from the point of view of the fact that there is no real production in it. On the other hand, the tourist product is mostly intangible, i.e. a service that is related to its immediate production and consumption. These peculiarities make it very difficult to define the new product as such. The new product, is a new service, a new production or delivery procedure, a new organizational form, and the introduction of a new technology. This necessitates the clarification of the main types of innovation in tourism.

The analysis of research in the field of the theory studying innovation gives reason to outline that the content of innovation is the change towards more efficient and economically more expedient production and organization of the enterprise’s activity and sales. Based on studies of the concept in the scientific literature, it can be summarized that the scope of the concept of innovation includes not only new or improved products and processes but also services, new marketing methods, for registering and validating brands and designs, as well as new forms of organization of economic activity and cooperation agreements.

In the researched literature, there is a tendency to increasingly view innovation as an open system in which different actors cooperate and interact, rather than as a set of individual innovations implemented in the enterprise

“Innovations” should be understood as the final result of the innovation activity, embodied in the form of a new or improved product introduced on the market, a new or improved technological process, new approaches used in commercial activity and relationships with customers that lead to overall changes in the activity and have an impact on the financial condition of the tourist enterprise.

3. INNOVATION ACTIVITY IN TOURISM

The variety of tourist activities and services, and the interrelationships of tourism with other sectors of the economy place the tourism industry among the main drivers of the world economy.

The tourism business is constantly changing to meet the changing needs of customers, so innovation is present in all areas of tourism, taking different forms. on the other hand, the tourism industry must continuously implement innovative solutions to make the tourism business more efficient, keep costs low, and maintain a competitive edge.

For example, the use of new technologies makes it possible on the one hand to personalize the customer experience and improve customer satisfaction, as problems can be solved in real-time, and on the other hand to streamline operations and reduce costs in different activities.

Due to the social need that tourism as an economic activity satisfies, the innovation activity of tourism enterprises is aimed at achieving both economic and social goals. Depending on the target effect, we mainly distinguish two groups of innovations: economic and non-economic (Figure 1).

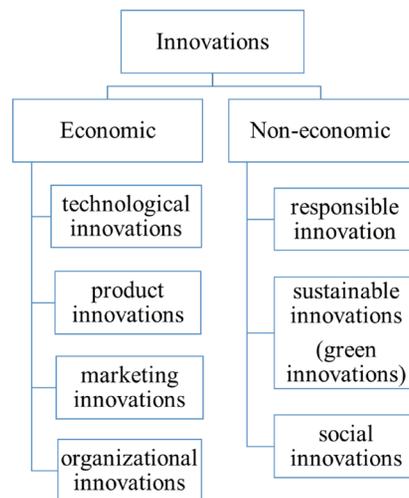


Figure 1. Types of innovation in the tourism enterprisesentence

Source: Ilieva and Todorova, 2023

The main types of innovation and implementation with economic expediency are (Ilieva & Todorova, 2023):

- technological innovations. They are related to the application of new or significantly improved methods of service and provision of tourist products, the implementation of technological innovations, through transfer from other industries, or innovations related to technologies specific to the tourism industry. Technological innovation addresses machinery and equipment, human resources, work methods, or a combination of the three. This innovation process is long-term, the investments in it are large, and the human resources involved are not only employees of the tourist enterprise but often also attracted (external) specialists;
- product innovations. Product innovation is related to the introduction of a new or improved product that differs from the company’s current products and services. This type of innovation does not involve product changes that are due to only minor changes.
- marketing innovations. This type of innovation is associated with innovations undertaken by the enterprise in the direction of more effective commercialization of tourism products, building brand attachment and managing customer relationships.
- organizational innovations. They are based on business practices for organizing the work process and relationships with other businesses and organizations; organization of work related to the distribution of responsibilities, decision-making and human resource management;

In addition to innovating to achieve the organization’s economic goals, more and more tourism businesses are also turning to non-economic innovations in their quest to respond to changes in consumer behavior and expectations.

Non-economic innovations are aimed at sustainable management of the tourist organization and include the following types (Ilieva & Todorova, 2023):

- social innovations - they are related to the processes of development and implementation of effective solutions aimed at supporting social progress and in most cases are based on the desire to solve social problems in the organization;

- sustainable innovations, also known as “green innovations” - are innovations that aim at sustainable growth based on minimizing the harmful impact of activity on the environment and more efficient and responsible use of natural resources;
- responsible innovation - their focus is building a relationship between researchers, businesses, citizens and educational institutions, with the aim of cooperation in the overall process of creating innovations that best meet the needs of society.

From the presented classification, we can summarize that the innovation activity of the tourist organization unites all the activities of implementing innovations, regardless of whether they aim at optimizing the activity, developing corporate social responsibility or sustainable management.

Regardless of the direction in which a tourist enterprise most actively innovates its activity, it cannot achieve its goals without making changes in all aspects of its activity.

The tourist enterprise cannot offer a new product or enter a new market without introducing new technologies, new raw materials, materials, machines and equipment, information and communication technologies. With the help of the transfer of technical and technological innovations from other sectors, the activity is optimized, the use of human labor and the time for serving tourists are reduced. The use of revolutionary information and communication innovations introduces modifications in the marketing, commercial and even management activities of tourism enterprises. This dependence on innovations in the tourism enterprise can be expressed through the innovation trajectory (Figure 2) that Jansen proposes.

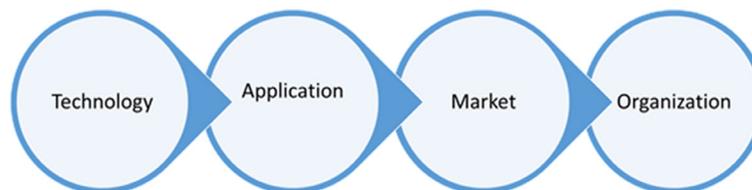


Figure 2. Innovation trajectory

Source: Adapted from [Jansen, 2002](#)

In the era of the information society, the market and its boundaries are blurring and tourists are looking for a direct connection with tourist enterprises, regardless of their size and their territorial location. This puts every entrepreneur in tourism to make himself “visible” and attractive to his customers, and this is impossible without innovation.

Growth in innovation activity is observed in periods of upheaval. COVID-19 was undoubtedly one that dynamized the implementation of innovations in tourism, innovations without which the tourism sector could not survive. Let’s present some examples of innovation in the tourism industry:

- Hybrid types of tourist services were developed such as: animation programs based on the economy of experiences, complementing tourist tours with digital guides, using virtual reality glasses for a more realistic touch of tourist attractions, dynamizing event tourism, etc.
- New accommodation facilities have appeared aimed at digital nomads, those looking for ecological and sustainable accommodation, ecovillages have been built, etc. The restaurants aimed their offer at vegan customers and customers looking for ecologically clean products.
- New technologies have entered the tourism sector, thus the functionality and information base for the facilities of the tourist infrastructure, routes, means of transport and the organization of events are constantly improving.

- Tourism businesses reorganized their activities in order to survive the crisis period, which subsequently increased the efficiency of their costs, for example, restaurants that did not offer delivery to the address introduced this service, others replaced their employees with robots, others optimized the sites and their social network profiles to reach a wider range of users.

4. FUTURE RESEARCH DIRECTIONS

The present research is the beginning of a larger study of the innovation activity of Bulgarian tourism enterprises. Future scientific research will be based on a survey aimed at determining the types of innovations they implement. A methodology for measuring and evaluating innovation activity and innovation efficiency will be developed.

As a first step of this study, aims to examine the measures taken by the state, in the person of the Ministry of Tourism, to stimulate the tourism industry for higher innovation activity.

One of the measures to promote innovative activity in tourism, undertaken by the state, is ranking for tourist activities, category “Innovations”. The award is aimed at innovative approaches, services, products, technological solutions, and concepts. The category is broad and can include various representatives of the tourism industry with different types of innovations such as:

- Start-up companies and companies that have implemented innovations;
- Innovative tourist products and services;
- Innovative marketing approaches/services;
- Technological innovations;
- Innovative approaches to customer service or collaboration with local communities;
- Innovative tourist animations;
- Innovative ways to promote or present a tourist site/attraction or destination.
- Other innovations related to the tourism industry.

As can be seen from the table. 1, annually nominated innovations in tourism are mainly technological and product innovations, with almost no marketing and organizational innovations. Among the winners for the period 2016-2023 are 5 products and 3 technological innovations that lead to complementing the existing products and optimizing the activity.

It is the combination of technologies that enhance the experiences of tourists by complementing tourism products based on cultural-historical heritage that are among the most highly valued innovations in tourism. This provoked the Ministry of Tourism, together with the Ministry of Innovation and the Ministry of Culture to create a new product and to undertake the re-branding of Bulgaria as a destination for innovation through key sectors such as culture, creative industries and historical heritage. Measures to promote the innovative activity of the tourism business are also provided for in many programs for which tourist enterprises have the opportunity to apply with a focus on the development of specialized forms of tourism such as sustainable tourism, ecological tourism, Spa and wellness tourism, organizing festivals and events for the promotion of Bulgarian culture and customs. Other programs are aimed at implementing green technologies in the activity of the tourism business.

Table 1. Nominations and awards in the innovations category at the Ministry of Tourism, Bulgaria

Year	Nominated	Winner
2023	<ol style="list-style-type: none"> 1. Yurt camping "Naedno", Neofit Rilski village 2. Atlas of traditions in the Sliven region 3. Municipality of Bansko and association "Tourist Business Union - Bansko" 4. Creation of the children's group "Archaeologists of the Future" at the Municipal History Museum, Ivaylovgrad 5. Umni.bg 6. events.gotoburgas.com - all events in one place! 	<p>Yurt camping "Naedno", Neofit Rilski village (Product innovation: A yurt village next to the "Naedno" campsite in the village of Neophyt Rilski offers an unparalleled nature-friendly accommodation. The yurt village has 20 yurts with a total capacity of 149 people, designed for all lovers of a healthy lifestyle.)</p>
2022	<ol style="list-style-type: none"> 1. "One day in the Medieval city" - Tuida Fortress – Sliven 2. TravelLine-Bulgaria RoomMix Innovation 2022 3. Summer festival "Opera on the peaks - Belogradchiski rocks" 4. Aqua Kalide Demonstration and Exhibition Center - Burgas Municipality 5. The innovative wine tour along the path of sparkling wine – Midalidare 6. Hotel Empire 7. The connecting cruise with a replica of a 4th century Roman ship "Danuvina Alacris" - Association of Danube Municipalities "Danube" 8. Events Guide Bulgaria - Event Plus BG 	<p>TravelLine-Bulgaria RoomMix Innovation 2022 (Technological innovation: Room Mix® is an option in TravelLine to the reservation system TL Booking Engine from TravelLine Bulgaria – a revolutionary innovation, unknown to Booking Engine, bringing higher efficiency of accommodation.)</p>
2021	<ol style="list-style-type: none"> 1. Historical Park, Varna 2. Ethnographic open-air museum "Eter", city of Gabrovo 3. Wine event - International Mavruda Day 4. Primorski shopping center - boutique scene for art and culture "Clock Tower", resort complex St. st Konstantin and Elena 5. All in one solution 9 high-tech solutions – one Smart Extranet – TravelLine Bulgaria 6. "Heterotopias" project, Municipality of Botevgrad and Leskovac National Museum 7. Summer festival Opera on the peaks - Belogradchiski rocks 8. House of Humor and Satire Museum, city of Gabrovo 9. Municipality of Gabrovo – Carnival 2021 	<p>Historical Park, Varna (Product innovation: The complex is a cultural-historical tourist attraction. Separate expositions of life and culture in our lands from the deepest antiquity (Neolithic and Chalcolithic dwellings, Thracian museum, reconstruction of Alexander's tomb) and cuisine with specialties based on authentic ancient recipes have been recreated.)</p>
2020	<ol style="list-style-type: none"> 1. Historical Park, Varna 	<p>Historical Park, Varna (Product innovation: The complex is a cultural-historical tourist attraction. Separate expositions of life and culture in our lands from the deepest antiquity (Neolithic and Chalcolithic dwellings, Thracian museum, reconstruction of Alexander's tomb) and cuisine with specialties based on authentic ancient recipes have been recreated.)</p>
2019	<ol style="list-style-type: none"> 1. Wireless biometric access control system (Wireless Biometric Locking System), BIODIT 2. Bitz Menada Krul Krajewski - An alternative for real estate owners in tourist destinations 3. Reservation system for direct hotel and/or through Turoperator sales. Dynamic Packaging Bulgaria 4. Mobile platform URBO, UPASS Ltd 5. Intelligent virtual assistant as a city concierge, Smart Solutions Ltd 6. Plovdiv City Card and Varna City Card, INOCITY Ltd 7. Card for health prevention, Bulgarian Union of Balneology and Spa Tourism 	<p>Plovdiv City Card and Varna City Card, INOCITY Ltd (Product innovation: Plovdiv and Varna City Card gives free access to the best museums and galleries, discounts at popular places, a free walking tour in English and an app that serves as a personal sightseeing guide. The app helps tourists visit more places in less time while saving money on entrance fees.)</p>

2018	<ol style="list-style-type: none"> 1. Innovative services and technological solutions in the travel industry - TravelLine 2. Bo&Bo Sports Club Innovations 3. Budin Festival - aerial acrobatics in the Baba Vida fortress 4. Campaign Become a friend of Sliven 5. Platform www.foreigner.bg 6. The Virtual eyes real-time virtual tourism platform 7. Castle in the Wind, 3D panoramic tours 8. 3D augmented reality of the Thracian sanctuary of Begliktash 9. 3D magnets in augmented reality with the Round Church of St. John 10. Platform www.fest.bg 11. New specialized web-portal of the Bulgarian Union of Balneology and Spa Tourism 12. KNG Water Rescue Service 	<p>3D augmented reality of the Thracian sanctuary of Begliktash (Technological innovation: A hologram of an ancient Thracian priest telling the legend of Begliktash to the visitors of the Historical Museum in Primorsko.)</p>
2017	<ol style="list-style-type: none"> 1. Danube Ultra cycle route, Digital Sova Ltd 2. Burgas Aviation Museum, Burgas Municipality Virtual journey through the Tunnel of Time, interactive museum Bezisten, Municipal Enterprise Tourism and Culture - Yambol 3. appLighthouse app 4. Mobile application Virtual monument in the palm of your hand, Municipal enterprise Tourism, public events and attractions - Shumen 5. A natural method of management (creation, maintenance and growth) of free beaches, Gencho Dinev Georgiev 6. The first tourist video blog in Bulgaria: www.bettytravels.com, Tsvetelina Tsankova 7. Water attraction Cifte Banya, Mineralni Bani municipality 8. The initiative Drones serve drinks on the beach, Albena AD 9. Bulgarian Hotel Standard Voluntary Categorization System, Bulgarian Association of Tourism Experts (BAET) 	<p>Danube Ultra cycle route, Digital Sova Ltd (Product innovation: With a total distance of 740 km, Danube Ultra is the longest tourist cycling route in Bulgaria. It connects the country's most northwestern settlement, the village of Kudelin (Bregovo municipality) with the most northeastern settlement, the village of Durankulak on the Black Sea. From Vidin to Silistra, the trajectory of the route overlaps the Eurovelo 6 transcontinental route.)</p>
2016	<ol style="list-style-type: none"> 1. Mobile app with Augmented Reality experience, Travel Books Publishing 2. Uva Nestum Wine & Spa Complex, Bilta EAD 3. MyBulgaria 4. Live cockroach exhibition, Regional History Museum - town of Bugras 5. Quick Orders - Platform and mobile application to browse e-menu, call a waiter and send orders directly from the customer's mobile device, Smart Tech Systems 6. Camping.bg – Bulgarian camping portal 7. Opera of the Peaks Festival, Sofia Opera and Ballet 8. Virtual reconstruction of the Pernik Medieval Fortress and Underground Mining Museum, Pernik Municipality 9. "Encouraging entrepreneurship in tourism and related sectors through innovative transfer of knowledge and skills in the field of entrepreneurship, introduction of innovations and application of information and communication technologies", Tourist Association "Kavarna" 10. iLoveDobrich – official interactive guide of Dobrich, Municipality of Dobrich 	<p>Mobile app with Augmented Reality experience, Travel Books Publishing (Technological innovation: The goal of the innovation is to make the tourist publications for Bulgaria more interesting and interactive. The mobile application and related software add a unique experience when reading and viewing the publications. In addition to the amazing photos taken by professional photographers, in the book, through the mobile application, you can view short videos from the tourist sites themselves.)</p>

Source: Own research

5. CONCLUSION

Research and analysis of innovation activity in tourism involves looking for innovations that are shared or different from innovations in other industries. In this regard, there are both generally applicable innovations, modified and adapted for the tourism business, and those that are unique to tourism.

Scientific research has led to the delineation of four main types of economic innovation: technological, product, marketing and organizational. The detailed study of the innovation process gives reason to claim that technological innovations are a basis for the creation of product, marketing and organizational innovations. Technological innovation is at the heart of the innovation trajectory.

Despite the difficulties of their research, the study and analysis of the results they bring to entrepreneurs is of particular importance, since tourism enterprises often fall outside the group of innovative companies.

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An Analytic Comparison of Quality Management Methodologies

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Continuous improvement



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Abstract: *The purpose of this study is to compare the Six Sigma methodology and the RADAR matrix, which are used to improve the continuous quality improvement of products, services, and processes in different organizations. An analytic comparison of these two methodologies is provided, highlighting the key requirements, similarities, differences, and limitations in their application. Regardless of the mission, needs, and demands every organization has, it is necessary to determine the proper way and a combination of methodologies and techniques for its implementation process.*

RADAR matrix or "RADAR-logic" provides a structured approach for the evaluation of organizational Results, Approach, Deployment, Assessment, and Review.

Six Sigma methodology is a systematic and disciplined approach to product or service design, including all organizational functions, that aims to reduce defects and improve processes within the final product/service.

Both Six Sigma methodology and RADAR-logic are complex, demanding, and powerful methodologies, and as a result, more time and resources are needed, for their appropriate implementation.

1. INTRODUCTION

Total Quality Management (TQM) has evolved as a strategic methodology in most organizations, regardless of their sector or size, to meet the challenges presented by the highly competitive business environment. Today, Total Quality Management (TQM) is a comprehensive management strategy with a primary focus on quality. It is based on continual improvement and organization-wide involvement. The goal of Total Quality Management (TQM) is to target the end customer and integrate quality awareness at every stage of all organizational processes. Businesses can outdistance their rivals by enticing clients with high-quality products at competitive and, mainly, low prices and adhering to a continuous improvement process.

Each organization will undoubtedly need to apply a suitable selection and combination of different techniques in its implementation process, regardless of the approach, tool, or methodology of the continuous improvement programs. Many employees of the organization can use the majority of these procedures, tools, and approaches, which are widely used and easy to comprehend, such as Deming's Circle or the PDCA cycle. However, some methodologies in this field, such as the RADAR matrix and Six Sigma, are more complex and demanding and therefore require more time and resources to be properly implemented. The proper selection of tools, approaches, and techniques for the appropriate team and their proper application to the right process are crucial. Understanding, knowledge, and appropriate use of tools, techniques, and approaches in organizational processes are necessary for their successful implementation.

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2. SIX SIGMA

Six Sigma is regarded as a Total Quality Management (TQM) implementation methodology. Six Sigma is a TQM methodology and an inventive approach to continuous process improvement. Since the main component of TQM is quality improvement, incorporating a Six Sigma program into the business's current operating system essentially covers every aspect of TQM. Compared to TQM, the scope of Six Sigma has expanded significantly.

2.1. Six Sigma Philosophy

Six Sigma is a business performance improvement method that intends to decrease the frequency of defects and mistakes to as low as 3.4 occasions per million chances. Although all the quality improvement initiatives are beneficial in their ways, they frequently fail to achieve improvements in both quality and bottom line. Voelkel (2002) contended that Six Sigma combines financial, methodological, and management elements to enhance products and processes more effectively than other techniques. Six Sigma, which is mostly guided by practitioners, has developed a strong viewpoint and is frequently recommended as having universal applicability. Even though it is still grounded in the core techniques and resources of conventional quality management, Six Sigma has a significant influence on the quality management strategy (Goh & Xie, 2004).

Harry and Schroeder (2000) pointed out that Six Sigma is a strategic initiative aimed at improving customer satisfaction, increasing market share, and profitability through statistical tools that have the potential to produce innovative gains in quality. Moreover, according to Antony and Banuelas (2001), Six Sigma is a business improvement approach that raises profitability, eliminates waste, reduces quality costs, and increases the efficiency and efficacy of all operational procedures that fulfill needs or exceed the expectations of customers.

Six Sigma is defined by Kuei and Madu (2003) as *Six Sigma quality means meeting the very specific goal provided by the 6 σ metric, and management means enhancing process capabilities for Six Sigma quality.*

2.2. Six-Sigma Methodology

The Six Sigma methodology is a systematic and logical approach to identifying and solving problems. It is based on well-known and accepted statistical methods to measure important process parameters.

The two primary Six Sigma approaches, which are applied in different business environments, are as follows: DMAIC and DMADV. Each term's name is derived from the main steps in its processes, but each term has its own specific application. DMAIC (Define, Measure, Analyze, Improve, and Control) is used to correct an existing process (Antony & Banuelas, 2001). DMADV (Define, Measure, Analyze, Design, Validate) is used to develop a new process (Figure 1).

DMAIC. A crucial component of a business's Six Sigma program is DMAIC, or Define, Measure, Analyze, Improve, and Control. It is a data-driven life-cycle approach to Six Sigma initiatives for process improvement. The abbreviation DMAIC stands for "Define, Measure, Analyze, Improve, and Control," which are five interrelated steps. Each phase's condensed definitions are as follows:

- Define by identifying the initial business case and by understanding the business objectives, the business impacts, and the customer requirements.
- Measure it by understanding the current performance of the business and by clarifying the key process characteristics to map the process in detail.
- Analyze by understanding and determining the key causes of baseline performance and by establishing and verifying key process variables for driving performance.
- Improve by defining and implementing solutions (which will eliminate the defects and correct the process) and by monitoring the results.
- Control by ensuring that the sustainability criteria are met and by spreading the learning to other possible areas of the business. The control phase also includes a review of the project for lessons and future improvements.

The DMAIC framework is most frequently used for implementing Six Sigma and operational excellence methodologies. Therefore, DMAIC is a crucial component of a Six Sigma initiative. Each phase's criteria are defined, the project is examined, and if the requirements are satisfied, the subsequent phase begins (Amar & Davis, 2008).

DMADV. In today's fast-paced and fiercely competitive business environment, companies are constantly striving for improvement in their operations and providing products and services that either meet or surpass the expectations of their customers. Six Sigma methodologies are important in reaching this objective by increasing productivity and reducing defects. DMADV (Define, Measure, Analyze, Design, and Verify) is a known methodology of Six Sigma (Breyfogle III, 2003). According to Thakore et al. (2014), DMADV is also known as the DFSS approach (Design for Six Sigma). DMADV is used in the design and creation of new processes (Anderson et al., 2006).

The development of new products, services, or procedures is supported by the Six Sigma framework, DMADV. It is an acronym for the five stages of DMADV: Define, Measure, Analyze, Design, and Verify:

- Define the scope of the process and the project goals, which are consistent with the company's strategy and customer demands.
- Measure and identify characteristics that are critical to quality (CTQs), production process capability, product capabilities, and risks.
- Analyze the collected data to identify potential issues and find the best design for the process, product, or service.
- Design an improved alternative; create and test the product, service, or process.
- Verify the designed process or product to ensure that the defined goals meet the customer's requirements.

DMADV is frequently referred to as DMAIC's next step (Six Sigma).

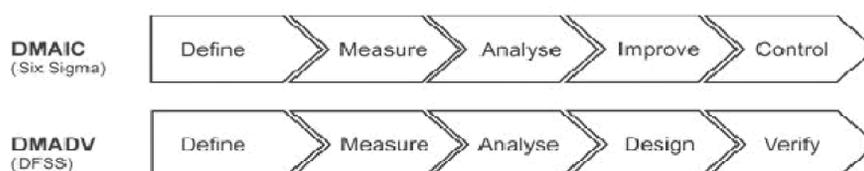


Figure 1. DMAIC and DMADV (Six Sigma)

Source: Sokovic et al., 2010

Table 1. Benefits of DMAIC and DMADV

DMAIC	DMADV
Customer Satisfaction Structured Problem-Solving Data-Driven Decision-Making Cost Reduction Alignment with Strategic Goals Enhanced product or service quality	Customer Satisfaction Increased Sales and profits Enhanced process efficiency Defects Reduction

Source: Own research

Summarizing the benefits of Six Sigma methodology (both DMAIC and DMADV), the most important benefit of Six Sigma is the increased quality, productivity, and efficiency. Another important benefit of Six Sigma is the reduction of defects and costs. Increased customer satisfaction, improved time management, and increased engagement and morale among employees are also critical benefits of Six Sigma.

3. RADAR MATRIX

3.1. Definition

RADAR (Results, Approach, Deploy, Assess, and Refine) is a structured model to assess an organization's performance. RADAR is a key component of an organization's program using the EFQM excellence model. The acronym RADAR stands for Results, Approach, Deploy, Assess, and Refine, which are five interrelated processes (Figure 2). All phases have the following condensed definitions:

- Define the Results the organization's approach seeks to achieve.
- Identify and design Approaches to achieve the required results both now and in the future.
- To ensure implementation, Deploy the approaches methodically in reality.
- Assess and Refine the deployed approaches based on ongoing learning activities, monitoring, and analysis of the attained results.

All nine EFQM excellence criteria are supported by the RADAR matrix, which also includes an enabler matrix for supporting the analysis of approaches under the five enabler criteria and a results matrix for supporting the analysis of results within the four result criteria.

3.2. Application

The EFQM excellence model applies the RADAR matrix to evaluate organizational performance. It is therefore a crucial component of excellence in model methodology. RADAR is a methodical way to evaluate an organization's performance.

The RADAR logic offers a structured method to use the EFQM excellence model to assess an organization's performance. It also assists in managing change and improvement initiatives inside an organization. It also supports the scoring system used for the European Excellence Award and other recognition or assessment programs. Today, the European Union's member states have developed more than 26 national awards for excellence. A thorough evaluation of an organization's level of excellence can be conducted with the support of RADAR logic. To assess organizational performance systematically, the criteria for each RADAR phase are specified, and the organization, or a part of it, is assessed through all four phases.

In essence, the RADAR matrix approach can only be applied when processes are measured. Without measurement, performance levels cannot be established or enhanced. That implies that companies cannot use RADAR if they are unable to implement a systematic integrated monitoring system based on their techniques. Thus, implementing continual improvements within the organization requires a system of proper, methodical monitoring and assessment.

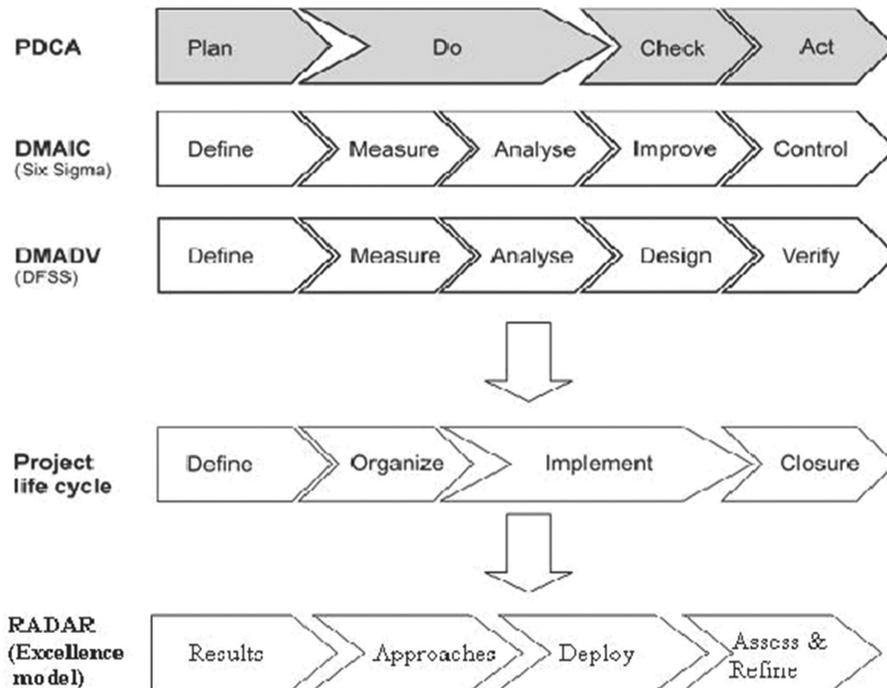


Figure 2. RADAR matrix

Source: Sokovic et al., 2010

4. CONCLUSION

The approach to implementing continuous quality improvement can differ from organization to organization. Every organization needs to use the proper combination and selection of quality techniques, methodologies, and tools during the implementation process, regardless of the continuous improvement programs' methodology. The techniques, tools, and methodologies must be precisely selected following the requirements and needs of the company's team and then appropriately implemented according to the suitable procedure and strategy within the company.

DMAIC methodology, which is an integral part of Six Sigma, offers a rigorous framework for results-oriented project management. DMAIC is also fact-based and systematic. When the process is flexible and excludes unproductive steps, the best results from the DMAIC methodology are achieved. Additionally, an iterative method can be required, particularly if some of the company's employees are new and are unaware of the techniques and tools.

DMADV is a crucial Design for Six Sigma (DFSS) methodology used for developing new products, services, or processes. The DMADV technique is also implemented for creating significant new features for existing products, services, or processes. Moreover, any organization implementing Six Sigma in its product or service development processes should use the DMADV technique to solve problems.

Both methods consist of five phases. DMAIC is used to improve processes that are already in place, while DMADV is used when customers are dissatisfied with existing company practices or when the current procedures are not reaching their objectives. DMADV is a preventive strategy, whereas DMAIC is more of a corrective plan.

The RADAR methodology provides a structured approach to assessing the organization's performance using the EFQM Excellence Model. The RADAR methodology is also known as RADAR logic or RADAR matrix, and it is a powerful management tool and a dynamic assessment system for the evaluation of organizational assessment, results, and approaches. The RADAR methodology is a systematic, strategic, and fact-based approach.

The objective of both the RADAR matrix and Six Sigma is to ensure the sustainability of the organization through quality continuous improvement (C.I.). Therefore, both methodologies serve as tools for Continuous Improvement (C.I.). Radar methodology and Six Sigma techniques are used for the continuous improvement of products, services, and processes in organizations.

Both Six Sigma and RADAR methodologies are complex and powerful techniques. These methodologies are also demanding and therefore need more resources and time for their successful implementation. The training of the organization's employees is an expensive process. The top management commitment is crucial to the success of implementing RADAR and Six Sigma techniques. Moreover, employee training and the involvement of all organizations' parts are essential to the success of Six Sigma. Radar and Six Sigma are effective tools for Quality Management (QM).

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Service Quality in Business Excellence Maturity Assessment

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Abstract: Service quality is a critical aspect of business excellence maturity assessment. It refers to the level of excellence achieved in delivering products or services to customers. Customer satisfaction and loyalty, as well as a company's overall reputation and success, are significantly influenced by the quality of its services.

This research paper focuses on research related to Service Quality in Business Excellence Maturity Assessment. In a business excellence maturity assessment, service quality is typically evaluated through various metrics and indicators. These may include customer satisfaction surveys, feedback from customers and employees, service delivery time, complaint resolution time, and other performance measures.

Our research contribution presents a literature review about ensuring that every interaction with customers is of the highest standard. It requires an organization-wide commitment to customer satisfaction, continuous improvement, and a culture of excellence.

1. INTRODUCTION – SERVICE QUALITY IN BUSINESS EXCELLENCE MATURITY ASSESSMENT

Quality services can create a positive customer experience, which is a critical factor in building customer satisfaction and loyalty (Maharsi et al., 2021). When customers receive services that meet or exceed their expectations, they are more likely to have a positive perception of the company and its offerings (Ghotbabadi et al., 2015). This positive experience can lead to customer loyalty, ensuring repeat business and fostering long-term relationships. A business that continuously provides top-notch services has a greater chance of drawing in happy, brand-loyal clients. These clients not only frequently buy the business's goods or services but also refer it to others, which broadens its clientele (Saffar & Obeidat, 2020).

Moreover, the quality of services directly impacts a company's overall reputation (Maharsi et al., 2021). A company known for providing excellent services is seen as reliable, trustworthy, and professional. Positive word-of-mouth from satisfied customers can enhance a company's reputation and attract new customers (Saffar & Obeidat, 2020). Conversely, poor service quality can severely damage a company's reputation and result in customer dissatisfaction and lost sales. Negative experiences spread quickly through word-of-mouth and online reviews, potentially deterring new customers from engaging with the company (Ghotbabadi et al., 2015).

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Furthermore, service quality is closely tied to a company's success and profitability. Satisfied customers are more likely to become repeat buyers, increasing the company's revenue. Loyal customers also tend to spend more on additional products or services, contributing to the company's bottom line (Saffar & Obeidat, 2020).

In contrast, companies that fail to prioritize service quality may see a decline in customer satisfaction and loyalty, leading to decreased sales and revenue. This can eventually hinder the company's overall success and competitiveness in the market (Saffar & Obeidat, 2020).

In conclusion, the quality of a company's services plays a vital role in customer satisfaction and loyalty, as well as the company's reputation and success. By consistently delivering high-quality services, a company can create positive customer experiences, build customer loyalty, enhance its reputation, and ultimately drive its growth and profitability (Horvat & Filipovic, 2018).

2. QUALITY IN BUSINESS EXCELLENCE MODELS

Quality has an important position among the Business Excellence Models' criteria. However, there is a differentiation between institutions concerned with quality. In other words, the consumer, the trader, the producer, the manager, the industrialist and the worker attach different importance to the quality of a good or a service. For example, for a manager, quality is directly related to the achievement of financial goals, and the continuous increase in the value of the company (Ritchie & Dale, 2000). But this does not concern the customer, who wishes to enjoy quality products at a good price, based on the fraction of value/money. Therefore, each factor sets its conditions for the concept of quality. Many organizations, businesses and even states, to record and measure quality, have established some models of business excellence, to codify the concept of quality commonly. So, they established some quality awards to promote quality improvement strategies. These National Quality Awards (NQAs) record an overall result using some partial criteria (Balouei Jamkhaneh & Safaei Ghadikolaie, 2022). Today, there are many Business Excellence Models against which the achievement of business excellence is measured. Among these criteria, the "customer" holds a central position, directly or indirectly, because it is strongly related to the result of the applied quality in all stages of the production of the product, from its design, its manufacture, its packaging, its distribution channel until it reaches the customer. We will analyze some important business excellence models below.

2.1. EFQM Model (Old)

The European Foundation for Quality Management is one of the most well-known business excellence models. The EFQM was launched in October 1989 when the presidents and CEOs of 67 European businesses signed the policy statement and vowed to fulfill the organization's goals. The EFQM Excellence Model is a framework for business excellence in organizational management that is intended to increase an organization's competitiveness. The old version of the EFQM Excellence Model consists of nine elements: Strategy, People Management, Leadership, Resources, Processes, People Satisfaction, Customer Satisfaction, Impact on Society, and Business Results (Nabitz et al., 2001). Among these 9 criteria, we find «customer satisfaction», a fact that shows that this factor has been a concern of management since the very beginning of Business Excellence Models and should be among those that should be evaluated.

2.2. EFQM Model (2020)

The EFQM Model was created to give enterprises in Europe and beyond a guide for creating an innovative and improvement-oriented culture. According to [Fonseca \(2022\)](#), the EFQM Model offers a contemporary interpretation of what good looks like today by utilizing current content, insightful data, a new vocabulary, and a new perspective on megatrends and other global developments that are transforming the environment in which we live. To co-create the new EFQM Model, leaders from over 60 distinct businesses were introduced face-to-face, 24 internal workshops were facilitated, approximately 2000 change specialists were questioned, and a core team of contributors and experts from academia and industry was established. The newest version of the EFQM Excellence Model is based on seven criteria, grouped into three dimensions, Results (what), Execution (how), and Direction (why), supported by 2 Results criteria and 23 Criterion parts, plus 112 guidance points. The seven criteria of the EFQM Excellence Model are: Purpose, vision, and strategy; Engaging stakeholders; Organizational culture and leadership; Driving performance and transformation; Creating sustainable value; strategic and operational performance and stakeholder perceptions ([Fonseca, 2022](#)). Although «customer satisfaction» has been eliminated in this newer model, the concept of stakeholder is nevertheless introduced and includes actors such as investors, customers, organizations, employees, governments, suppliers, and others.

2.3. Baldrige Excellence Framework (BEF)

Another model that highlights unique aspects of organizational performance is the Malcolm Baldrige National Quality Award (MBNQA), also known as the Baldrige Excellence Framework, which is used in the United States. Customer, Leadership, Strategy, Workforce, Knowledge Management and Operation and Result are the seven attributes that define the company's organizational excellence ([Matondang et al., 2018](#)). The Baldrige model places priority on the quality that should be ultimately delivered to customers, and one of these criteria is the “customer”.

2.4. The Deming Prize Award (DP)

Deming's theory initially included 14 quality control points, but subsequent scientific development of these points produced 7 criteria (Internal and external cooperation, Management of Learning Process, Continuous Improvement, Visionary Leadership, Customer Satisfaction and Employee Fulfillment ([Anderson et al., 1995](#)). Deming's theory identifies the “customer” as a crucial factor in the quality. The fact that Deming's theory was created in 1930 should be noted because it demonstrates the historical significance that management attaches to the standard that customers should experience.

2.5. Singapore Business Excellence Framework (SBEF)

In the business excellence framework of Singapore, “customer” is one of the seven key performance drivers (leadership, strategy, customers, people, processes, knowledge, and results). Organizational leadership establishes the vision and culture necessary to achieve organizational excellence by recognizing and addressing customers' demands and interests. Thus, it is feasible to grow as a person and improve the regulatory process's capacity to provide the desired outcomes, and to maintain this result, organizations need to innovate and learn through effective knowledge management ([Sulistyo et al., 2021](#)).

2.6. Dubai Government Excellence Model (DGEM)

An ambitious vision for the UAE has led to the development of a government excellence model (GEM), which is based on the orders of His Highness Sheikh Mohammed bin Rashid Al Maktoum, Vice President and Prime Minister of the UAE and Ruler of Dubai. Acquiring leadership roles in several domains also entails managing contemporary developments in public sector administration. The Dubai Government Excellence model consists of nine criteria (Main Functions, Seven Stars Services, National Agenda, Smart Government, Governance, Future Shaping, Management of Innovation, Human Capital, Assets, and Resources) (Zaabi, 2019). Although the Dubai Government Excellence Model does not include the criterion of «customers» or «customer satisfaction», we find the «seven-star service» criterion, a fact that shows the great importance that the state of Dubai attaches to quality service provision and, by extension, customer satisfaction.

2.7. Canada's Excellence, Innovation and Wellness Standard (CEIWS)

From the Canada Awards for Excellence, Canada's Excellence, Innovation, and Wellness Standard is derived. Excellence Canada is a non-profit organization that specializes in organizational excellence certification, implementation, and training in Canada. Six key areas of attention are included in the Organizational Excellence Standard (OES) and are referred to as drivers: planning, leadership, customers, people, partners, and processes (Barnawi, 2022). Therefore, one of the 6 pillars of the Canadian model of business excellence is «customers», thus attributing the vital importance this actor holds to the development of innovation and prosperity.

2.8. Australian Business Excellence Framework (ABEF) 2011

The Australian Business Excellence Framework (ABEF) is a comprehensive framework for management and leadership systems that describes the elements required for businesses to sustain high performance. It has been modified to consider Australia's distinct business and cultural environments. This model consists of six categories (Customers, Leadership, People, Strategy, Data and Information, Process) (Brown, 2013). So, a key component for a business seeking to achieve high performance in Australia is the appropriate approach to the «customer» factor.

2.9 African Excellence Model (AEM)

The African Excellence Forum offers a performance excellence model that any organization may utilize for internal self-evaluation. The African Excellence Model consists of 11 core concepts (client and market focus, strategy and planning, leadership, resources and information management, processes, social responsibility, people management, supplier and partnership performance, people satisfaction, client satisfaction, and business results) (Ladzani, 2016). In the African Excellence Model, we identify in 2 of the 11 basic parameters the concept of the «customer, either as a goal or through his satisfaction. So, the «customer» is central to the African model, and management should take this seriously.

2.10. Japanese model of excellence

This model of excellence was established in 1995. Its main characteristic is that it is based on the MBNQA. This model has eight criteria (Leadership and decision making, Management and social responsibility, understanding customers and interaction with customers & markets,

Strategic development, and planning, Improving the ability of individuals and organizations, Liability, Management information, Results and activities) (Tekic et al., 2011). This basic school of management focuses on understanding and interacting with customers, believing that there must always be business contact with customers' wishes and expectations.

3. SERVQUAL

To achieve and maintain a competitive advantage, any business or service provider must measure and prioritize customer satisfaction (Ramlawati, 2018). The foundation of a retail company's competitive advantage is service quality and stakeholder satisfaction, which includes customers, suppliers, employees, and creditors or bankers (Kim & Kim, 2020). The caliber of services offered is one of the primary factors influencing client satisfaction in a business network with varied needs. Nguyen et al. (2018) contend that a company's ability to meet the requirements and satisfaction of its customers is a critical differentiator in the market. The quality of services that the company provides to its clients—which includes all entities of high quality, such as superior products and services—has a significant influence on its ability to meet the needs of its customers (Kim & Kim, 2020). Customer discontent is a quality issue that businesses must handle since, if there is a mismatch between the company's level of quality and the true needs of the customer, it could result in loss (Shin et al., 2019).

The SERVQUAL model, which is still in use today, was created by Parasuraman and is one of the allusions to Zeithaml and Berry regarding service quality (Haming et al., 2019). A model of service quality was constructed by Parasuraman et al. (1985) using five basic dimensions. These dimensions are made up of 1. Tangibles: Everything tangible that has an impact on the level of customer service is included in this category. For instance, amenities for customers, on-site staff members, the atmosphere of the rooms, interior design, etc. 2. Reliability: This element refers to the company's ability to provide accurate services to customers. The company's products and services are currently available to customers at any time and from any location. The company is always willing to assist its customers. For example, cellular operator businesses provide signals in various locations based on the location of their clients. 3. Responsiveness: This factor explains how the company responds to customers promptly. This amount of responsiveness can be measured by asking questions regarding the company's interest in learning about the level of difficulty that its customers confront, its capacity to help customers solve problems, its responsiveness to customer complaints, and other subjects. 4. Assurance: This component relates to the business's capacity to cultivate client trust via the amiability and expertise of the service personnel. 5. Empathy: This element highlights the company's customer-first philosophy.

Corporate understanding can be put into practice by listening to customers, assisting them in finding solutions, recognizing what causes their anxieties, standing by them, and not abandoning them, among other things (Haming et al., 2019). Customer Contentment in today's fiercely competitive corporate environment is for an organization of great importance. So, its focus must be on its customers, if not, this could be disastrous. In the fiercely competitive business world, only customer-focused companies and those able to deliver exceptional value to customers will be able to thrive. Additionally, happy customers are less likely to be impacted by rivals. They are also less price-sensitive and exhibit longer-lasting loyalty (Ramlawati, 2018). Customer satisfaction is the emotional state that arises from evaluating a product's performance concerning the anticipated return (Haming et al., 2019). The quality of the products the companies sell is associated with customer or consumer happiness. According to what they receive, customers' achievement varies at different levels (Yoo et al., 2015).

The theory states that the SERVQUAL variable is comprised of:

- H1: Consumer expectations and perceptions regarding the tangible dimensions align, influencing retail customer behavior. contentment
- H2: Expectations and customer perceptions about the aspects of reliability satisfaction align, and this has an impact on retail customers.
- H3: The dimensions of responsiveness influence retail customer satisfaction because expectations and consumer perceptions align in this regard.
- H4: Expectations and consumer perceptions about assurance satisfaction are in line, which has an impact on retail customers.
- H5: Retail customer happiness is impacted by the alignment of consumer beliefs and expectations on the components of empathy.

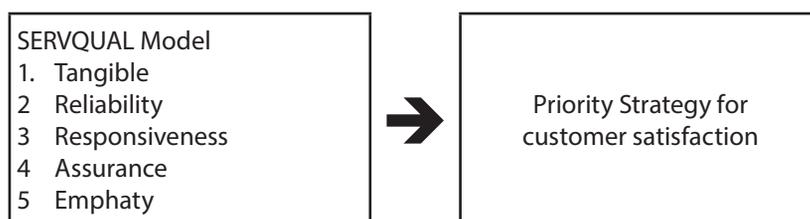


Figure 1. SERVQUAL Model

Source: [Haming et al., 2019](#)

Leadership responsibilities and organizational maturity levels are interdependent. The relationships between maturity and leadership traits may have useful applications in the processing of policies, raising the standard of overall service quality and the caliber of results ([Horvat & Filipovic, 2018](#)).

4. SERVICE QUALITY MANAGEMENT

The competitive industrial and technological environment in advanced industrialized nations has led to the emergence of the term “quality,” which is a term used in economics and it is used to control production and win over customers ([Ghotbabadi et al., 2015](#)). Quality is mostly determined by the feedback received from customers. Total Quality Management (TQM) is comprised of several key components, including operations management, strong leadership, employee involvement, continuous improvement, and customer focus ([Saffar & Obeidat, 2020](#)). The theory of business development and service management is essential to marketing to comprehend customer needs and wants, as well as what they truly evaluate and seek out ([Ghotbabadi et al., 2015](#)).

Quality management originated from two theories about improving organizational performance. As previously mentioned, the first concerned customers ([Horvat & Filipovic, 2018](#)). Our customers will return to us, recommend us to others, and help us grow if we can identify what it is that they like and deliver it consistently. Reliability—you know what to anticipate and replicability—we can replicate it, so it is consistent every time—are two ways to conceptualize quality. Efficiency was the second driving force behind the quality management movement ([Saffar & Obeidat, 2020](#)). We will be more successful if we can determine the most effective way to produce a good or service and quit wasting time, and resources, fixing damaged goods, or providing subpar services. The service encounter itself determines the service quality. As if we needed a reminder, the secret to delivering TQSM is keeping the customer in mind ([Horvat & Filipovic, 2018](#)).

If a service is truly fit for its intended use, has precise specifications that have been followed, can be delivered consistently, can recognize when something goes wrong and know how to fix it to prevent the same error from happening again, and so on, then we can probably say that we are managing service quality (Saffar & Obeidat, 2020). These principles directly relate to the idea of codifying and independently establishing quality standards that are issued by third parties; the ISO 9000 quality standards series is the best example of this concept (Horvat & Filipovic, 2018). Quality has the potential to be a “magic bullet” that boosts margins, lowers costs, improves customer service, and produces better goods and services. It becomes impossible to ensure and add value without quality management (Haming et al., 2019).

5. CONCLUSION

This article deals with service quality in Business Excellence Maturity Assessment. As mentioned, the paper’s primary goal was to analyze the level of excellence achieved in delivering products or services to customers.

Service Quality Management is the process of managing the caliber of services to a customer according to his expectations. In essence, it evaluates the effectiveness of a service to increase customer satisfaction. Customer perception is the primary factor used to measure service quality, and it may differ from what is intended. Several models are used to determine the gap between the perceived and expected services. SERVQUAL is one of these commonly used models, which measure service quality, and it is shortly described in this study, based on the five service quality dimensions, which are assurance, tangibility, reliability, empathy, and responsiveness.

An extensive assessment of the academic literature was conducted on the published research that empirically examined the important business excellence models (BEMs). These models are analyzed focusing on the perspective of customers.

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Business Excellence Models and Systems of Production

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Abstract: *The research is compiled to provide a thorough overview of nine well-known business excellence models (BEMs) applied in various countries and organizations worldwide. The literature survey included forty-five articles related to business excellence models as a highly useful framework for the improvement and assessment of Quality Management and Human Resources Management within several organizations. A total of seventy-six evaluation criteria emerged from the nine BEM overviews, which were grouped and presented as type “a” criteria and then classified into three categories (inflows, production, and outflows) presented as type “b” criteria based on the above study. The research findings point out that these critical factors connected to the most dominant of the seventy Business Excellence Models evaluation criterion “a” and of the organizational categories refer as criterion “b” can influence the application of quality practices or management initiatives at a firm.*

1. INTRODUCTION

Many researchers over the past decades (Dlungwana et al., 2002; Ershadi & Eskandari Dehdazzi, 2019; Zdrilić & Dulčić, 2016) have demonstrated how successful it is in applying Business Excellence Models (BEMs) to organizations’ performance improvement and in their long-lasting competitiveness and sustainability (Asif et al., 2011; Criado-García et al., 2019). BEM also constitutes a highly useful framework for implementing Quality Management (QM) to assess the performance and the interactions of a corporation’s human capital (employees) to achieve present and future organizational objectives.

2. BUSINESS EXCELLENCE (BE)

Regarding management and result achievement, Business Excellence constitutes the definition of a company’s or organization’s high level of maturity (Zdrilić & Dulčić, 2016). The goal of business excellence is to enhance an organization’s management practices and systems to boost output and add value for all stakeholders involved. A quality system is only one aspect of business excellence, but it involves attaining excellence across the board for a company (including leadership, people and processes, customer focus, strategy, and information management), above all, it involves delivering better financial outcomes (Adámek et al., 2020; Zdrilić & Dulčić, 2016). Business excellence is frequently defined as the application of leading methods or organizational techniques to achieve outcomes while complying with a core set of principles or values within an organization (Adámek et al., 2020).

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2.1. Business Excellence Systems Models (BEM)

According to [Fonseca \(2021\)](#), one of the most popular frameworks used by businesses to execute quality management is the Business Excellence Models (BEM) model, which includes the EFQM model.

Table 1. Criteria (type “a”) and frequency

I/N	CRITERIA (type “a”)	Frequency
1	Assets and Resources	1
2	Client & Market Focus	1
3	Client Satisfaction	1
4	Creating Sustainable Value	1
5	Customer Satisfaction	1
6	Customers	5
7	Data and Information	1
8	Decision making	1
9	Driving Performance & Transformation	1
10	Engaging Stakeholders	1
11	Future Shaping	1
12	Governance	1
13	Human Capital	1
14	Impact on Society	1
15	Improving the ability of individuals and organizations	1
16	Information management	1
17	Innovation Management	1
18	Knowledge management	2
19	Leadership	8
20	Liability	1
21	Main Functions	1
22	Management	1
23	National Agenda	1
24	Operation	1
25	Organizational Culture	1
26	Partnership Performance	2
27	People management	2
28	People satisfaction	5
29	Planning	2
30	Processes	5
31	Purpose	1
32	Resources	2
33	Results	4
34	Seven Stars Services	1
35	Smart Government	1
36	Social responsibility	2
37	Stakeholder Perceptions	1
38	Strategic & Operational Performance	1
39	Strategic planning	1
40	Strategy	6
41	Suppliers	1
42	Vision	1
43	Workforce	1
	SUMMARY	76

Source: Own research

The present study displays nine well-known models, from which 76 evaluation criteria emerged, which are defined as type “a” criterion (Table 1). The presented models are the following: 1) African Excellence Model (AEM) 2) Australian Business Excellence Framework (ABEF) 3) Baldrige Excellence Framework (BEF) 4) Canada’s Excellence, Innovation and Wellness Standard (CEIWS) 5) Dubai Government Excellence Model (DGEM) 6) EFQM Model (Old) 7) EFQM Model (New) 8) Singapore Business Excellence Framework (SBEF). 9) Japanese Model of Excellence. Table 1 illustrates the examined criteria (type a) and the frequency of occurrence of each criterion in the models.

3. BUSINESS EXCELLENCE MODELS

3.1. African Excellence Model (AEM)

The African Excellence Forum (AEF) assists managers of African and Arabian organizations in accelerating the process of elevating excellence to a critical factor in gaining a competitive edge in the global economy. It provides a Performance Excellence Model that any organization may utilize for internal self-evaluation. The main concepts of this model are: 1) Leadership, 2) Clients and Marketplace Management, 3) Planning and Strategy, 4) Information and Resources Management, 5) People Management 6) Process Management, 7) Social Responsibility, 8) Client Satisfaction, 9) People Satisfaction, 10) Partnership and Suppliers Performance, 11) Business Results (Ladzani, 2016).

3.2. Australian Business Excellence Framework (ABEF)

The Australian Business Excellence Framework (ABEF) is a comprehensive model for leadership and management systems that summarizes the components businesses need to maintain high-performance levels. ABEF has been modified to consider Australia’s cultural and business environments (Brown, 2013). This framework consists of six major categories. 1) Customers; 2) Leadership; 3) Strategy; 4) People Management; 5) Data and Information; 6) Process Management (Brown, 2013).

3.3. Baldrige Excellence Framework (BEF)

The Malcolm Baldrige National Quality Award, or Baldrige Excellence Framework, is another curriculum emphasizing the characteristics and features of organizational performance and comprises the following characteristics of organizational excellence: 1) Customer Service; 2) Knowledge Management; 3) Leadership; 4) Strategy; 5) Workforce 6) Operation; 7) Result (Matondang et al., 2018).

3.4. Canada’s Excellence, Innovation and Wellness Standard (CEIWS)

Canada’s Excellence, Innovation, and Wellness Standard is derived from the Canada Awards for Excellence. The context of this BEM is managed by Excellence Canada, a nonprofit company that is qualified to certify an organization’s excellence in Canada and possesses experience in training and implementation (Barnawi, 2022). The Standard for Organizational Excellence (OES) focuses on six sectors, which are called drivers: 1) Leadership; 2) Planning; 3) Customers; 4) People; 5) Processes; and 6) Partners (Barnawi, 2022).

3.5. Dubai Government Excellence Model (DGEM)

A government excellence model (GEM) was developed by the UAE following directives from His Highness Sheikh Mohammed bin Rashid Al Maktoum, the Vice President and Prime Minister of the United Arab Emirates as well as the ruler of Dubai, as part of their ambitious goal. The Government Excellence Model (GEM) can be used by UAE government agencies to evaluate and improve their performance. Dubai Government Excellence Model (DGEM) is designed to maintain the momentum of excellence and to motivate government entities on their journey to excellence. It is intended that this momentum will lead to notable advancements in leadership and performance responsibilities. The model of Dubai Government Excellence (DGEM) consists of nine criteria: 1) Principal Objectives, 2) National Planning, 3) Services with Seven Stars, 4) Role of Governance, 5) Future Forming, 6) Astute Administration, 7) Human Factor, 8) Resources and Assets, and 9) Managerial Innovation (Al Zaabi, 2019).

3.6. EFQM Model (Old version)

The European Foundation for Quality Management (EFQM) supports the EFQM Excellence Model, which offers a framework for business excellence in organizational management. According to Nabitz et al. (2001), its main objective is to assist businesses in becoming more ambitious and aggressive. The EFQM Excellence Model (old version) is composed of nine critical criteria 1) Strategy, 2) People, 3) Leadership, 4) Processes, 5) Resources, 6) People Satisfaction, 7) Customer Satisfaction, 8) Society's Impact, and 9) Business Results (Nabitz et al., 2001).

3.7. EFQM Model 2020 (New version)

Since the beginning of its creation, the EFQM excellence model has offered organizations in and outside of Europe a roadmap for creating a culture that prioritizes innovation and continual improvement. Now, through the adoption of updated content, precise data, a new language, and a new perspective on megatrends and other global movements that are transforming the world in which we live (Fonseca, 2021). The process of co-creation of the new EFQM included a survey that involved nearly 2000 change experts, the set-up of 24 internal workshops, conversing in person with executives from more than 60 different companies, and assembling a main group of specialists and authors from academia and industries (Fonseca, 2021). The EFQM Model is made of seven criteria: 1) Leadership and Organizational Culture, 2) Purpose, Vision and Strategy, 3) Creating Sustainable Value, 4) Engaging Stakeholders, 5) Stakeholder Perceptions, 6) Driving Performance and Transformation, and 7) Operational and Strategic Performance (Fonseca, 2021).

3.8. Singapore Business Excellence Framework (SBEF)

The relationship between seven key performance drivers in business excellence is illustrated by the Singapore Quality Award: 1) Strategy, 2) Customers, 3) Leadership, 4) Processes, 5) People, 6) Knowledge, and 7) Results (Sulistyo et al., 2021). To achieve organizational excellence, organizational leadership establishes the vision and culture necessary by recognizing and addressing customers' demands and interests. Thus, it is feasible to grow as a person and enhance the capability of the regulatory procedure to provide the desired outcomes, and to sustain this outcome, companies are required to implement innovation and learn through efficient knowledge management (Sulistyo et al., 2021).

3.9. Japanese model of excellence

This model of excellence was established in the 1995th year. Its main characteristic is that it is based on the MBNQA. A model of this award is shown and has eight criteria: 1) Leadership and decision-making 2) Management and social responsibility 3) Understanding and interaction with customers and markets 4) Strategic planning and development 5) Improving the ability of individuals and organizations 6) Liability 7) Management information 8) Results and activities (Tekic et al., 2011).

4. RESEARCH METHODOLOGY

After studying the existing literature of the previous paragraph, we searched for the areas, which we called “b” type criteria, in which the individual 76 total “a” type criterion of the 9 BEMs is classified. Thus, we ended up with 3 «b» type criteria: inflows, production, and outflows. The table below shows the ranking of the 76 types “a” criterion in the three columns formed by the groups of type “b” criteria.

Table 2. Grouping of type “a” criterion according to type “b”

	CRITERIA type “a”	CRITERIA type “b”			Reference	
		FREQ.	Inflows	Production		Outflows
1	Assets and Resources	1	1	-	-	Al Zaabi (2019)
2	Client & Market Focus	1	-	-	1	Ladzani (2016)
3	Client Satisfaction	1	-	-	1	Ladzani (2016)
4	Creating Sustainable Value	1	-	-	1	Fonseca (2021)
5	Customer Satisfaction	1	-	-	1	Brown (2013)
6	Customers	5	-	-	5	Matondang et al. (2018), Barnawi (2022), Nabitz et al. (2001), Sulistyono et al. (2021), Tekic et al. (2011)
7	Data and Information	1	1	-	-	Brown (2013)
8	Decision making	1	-	1	-	Tekic et al. (2011)
9	Driving Performance & Transformation	1	-	1	-	Fonseca (2021)
10	Engaging Stakeholders	1	-	-	1	Fonseca (2021)
11	Future Shaping	1	-	-	1	Al Zaabi (2019)
12	Governance	1	1	-	-	Al Zaabi (2019)
13	Human Capital	1	1	-	-	Al Zaabi (2019)
14	Impact on Society	1	-	-	1	Nabitz et al. (2001)
15	Improving the ability of individuals and organizations	1	-	1	-	Tekic et al. (2011)
16	Information management	1	-	1	-	Ladzani (2016)
17	Innovation Management	1	-	1	-	Al Zaabi (2019)

		CRITERIA type "b"				
	CRITERIA type "a"	FREQ.	Inflows	Production	Outflows	Reference
18	Knowledge management	2	-	2	-	Matondang et al. (2018), Sulisty et al. (2021)
19	Leadership	8	-	8	-	Ladzani (2016), Brown (2013), Matondang et al. (2018), Barnawi (2022), Nabitz et al. (2001), Fonseca (2021), Sulisty et al. (2021), Tekic et al. (2011)
20	Liability	1	-	-	1	Tekic et al. (2011)
21	Main Functions	1	-	1	-	Al Zaabi (2019)
22	Management	1	-	1	-	Tekic et al. (2011)
23	National Agenda	1	1	-	-	Al Zaabi (2019)
24	Operation	1	-	1	-	Matondang et al. (2018)
25	Organizational Culture	1	-	1	-	Fonseca (2021)
26	Partnership Performance	2	-	2	-	Ladzani (2016), Barnawi (2022)
27	People management	2	-	2	-	Ladzani (2016), Nabitz et al. (2001)
28	People satisfaction	5	-	-	5	Ladzani (2016), Brown (2013), Nabitz et al. (2001), Sulisty et al. (2021), Barnawi (2022)
29	Planning	2	-	2	-	Ladzani (2016), Barnawi (2022),
30	Processes	5	-	5	-	Ladzani (2016), Brown (2013), Barnawi (2022), Nabitz et al. (2001), Sulisty et al. (2021)
31	Purpose	1	-	-	1	Fonseca (2021)
32	Resources	2	2	-	-	Ladzani (2016), Nabitz et al. (2001)
33	Results	4	-	-	4	Ladzani (2016), Matondang et al. (2018), Sulisty et al. (2021), Nabitz et al. (2001)
34	Seven Stars Services	1	-	-	1	Al Zaabi (2019)
35	Smart Government	1	-	-	1	Al Zaabi (2019)
36	Social responsibility	2	-	-	2	Ladzani (2016), Tekic et al. (2011)
37	Stakeholder Perceptions	1	1	-	-	Fonseca (2021)
38	Strategic & Operational Performance	1	-	1	-	Fonseca (2021)
39	Strategic planning	1	-	1	-	Tekic et al. (2011)
40	Strategy	6	-	6	-	Ladzani (2016), Brown (2013), Matondang et al. (2018), Nabitz et al. (2001), Fonseca (2021), Sulisty et al. (2021)

	CRITERIA type "a"	CRITERIA type "b"				Reference
		FREQ.	Inflows	Production	Outflows	
41	Suppliers	1	1	-	-	Ladzani (2016)
42	Vision	1	-	1	-	Sulistyo et al. (2021)
43	Workforce	1	1	-	-	Matondang et al. (2018)
	SUMMARY	76	10	39	27	

Source: Own research

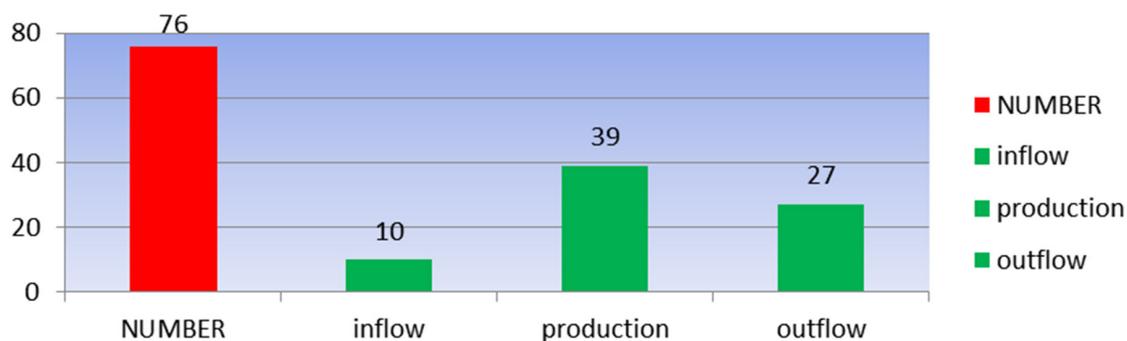


Figure 1. Grouping of type "a" criterion according to type "b"

Source: Own research

5. CONCLUSION

The present research paper demonstrates the importance of the crucial criteria of the nine well-known Business Excellence Models (BEMs) applied in different countries and organizations worldwide concerning quality management.

In section 2, we presented the 76 criteria of nine Business Excellence Models, aggregated. In section 3, we presented the nine Business Excellence Models and the criteria for each model.

Section 4 is the research part of the paper. In this chapter, we presented a research study on how the nine existing BEMs assign value to the three stages, which we termed "b" type criteria. As can be seen from the recording of the data, "production" is in the first place (39), with an important distance from the second "outflows". This is expected because it proves the importance of management inside companies, according to the theory of Business Excellence Models. Among the 39 criteria that make up "production", the «leadership» criterion, which appears in 8 of the 9 models, holds first place, leaving the «strategy» (6) in second place and the «processes» (5) in third place. This result shows the pivotal importance of business leadership in the diffusion and application of the principles of excellence within business.

We additionally identified the "outflows". The outflows determined the interest and extroversion that a company must show to prevail in the market and in the sector where it operates. Among the 27 criteria that make up "outflows", «customers» and whether they are satisfied («customer satisfaction») dominate the first positions. This proves how important it is to study the market, focusing on the customer, to find and satisfy their needs. Obviously, the importance of extroverted business policies is highlighted, as they play a vital role in the marketing function.

In the third and last place, with only 10 criteria out of a total of 76, we find inflows, which shows the rather small importance that BEM attributes to inflows, which they take for granted.

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Product and Service Management Implementation Maturity Assessment – A Literature Review. A Proposal for a Maturity Assessment Framework

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Abstract: *Maturity models use predetermined scales to evaluate the degree of implementation success as well as its progression. Benchmarking and comparison with other rival businesses operating in the same or related areas are frequently facilitated by the assessment. A specialized approach or an all-encompassing (organization-wide) approach might be used to evaluate maturity.*

The main subject of this paper is research on maturity evaluation as it relates to the product-service process. An examination of the literature on performance metrics used in the product-service management process. Any activity that takes place between the conception and development of a product and its delivery to a client is part of the process known as product-service management. Supply chain management, manufacturing, logistics, procurement, and customer service (including marketing, sales, and after-sales) are a few of these tasks.

We present the Glykas Quality Compass (GQC), a mapping tool that helps organizations map all quality activities. It categorizes implementation initiatives into four primary groups: excellence awards, standards, techniques, and philosophies.

1. INTRODUCTION

The product-service process is a combined approach that delivers both a physical product and a service component to the customer (Macke & Genari, 2019). Product management is the process of identifying and defining customer needs, developing product features and specifications that meet those needs, and managing the product development cycle from ideation to launch (Yang & Evans, 2019). Service management, on the other hand, involves designing, delivering, and managing services that meet or exceed customer expectations (Guest et al., 2021). This includes identifying customer needs, setting service level standards, and measuring and monitoring customer satisfaction (Gürlek & Uygur, 2021).

Both product and service management need to have a strong focus on creating value for customers and require close collaboration between departments such as marketing, sales, operations, and customer service to be successful (Yang & Evans, 2019; Gürlek & Uygur, 2021). People and their management become more and more important, especially within the context of an intensely competitive economic situation, marked by circumstances like the expansion of markets globally, the constant shifting of consumer demands, and the growing product-market

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competition, while at the same time, many other sources of competitive success are becoming less powerful (Vásquez et al., 2021). During recent years, the global community has witnessed a visible upsurge in globalization, wherein the economies of numerous nations are increasingly interwoven, fostering international trade through advancements in technology and enhanced connectivity (Saa-Pérez & García-Falcón, 2002).

2. LITERATURE REVIEW

2.1. Product and Service Management

Product and service management is a function that involves the development, production, marketing, and ongoing support of services and products offered by an organization (Bustinza et al., 2019). At the core of product management is the process of identifying and defining customer needs, developing product features and specifications that meet those needs, and managing the product development cycle from ideation to launch (Macke & Genari, 2019). On the other hand, service management involves designing, delivering, and managing services that meet or exceed customer expectations (Gürlek & Uygur, 2021). This includes identifying customer needs, setting service level standards, measuring, and monitoring customer satisfaction. Both product and service management need to have a strong focus on creating value for customers and require close collaboration between departments such as marketing, sales, operations, and customer service to be successful (Yang & Evans, 2019).

Product management is a diverse role that encompasses a wide range of responsibilities ranging from product development and strategy to marketing and sales. By extension, the role of a product manager focuses on guaranteeing that a product aligns with the requirements of its target market and that it achieves a favorable positioning in the marketplace (Macke & Genari, 2019). Additionally, a product manager is tasked with developing go-to-market strategies, managing budgets, and overseeing every facet of the product lifecycle (Adrodegari & Saccani, 2020). Other duties include conducting research and investigative analysis, formulating strategies, communicating plans, coordinating development efforts, responding to feedback and data analysis, as well as crafting and maintaining a product roadmap (Bustinza et al., 2019).

One of the most important responsibilities of a product manager is market research, as it plays a crucial role in gaining deeper insights into user needs, competition, and the overall market landscape. This type of knowledge is crucial to develop a successful strategy. Product strategy should be in line with the company's overall goals and branding (Röglinger et al., 2012) and should also be communicated to involved employees within the organization. It should also clearly articulate the product vision to stakeholders to gain their acceptance (Macke & Genari, 2019).

A product manager is also accountable for coordinating various facets of product development. This encompasses collaborating with engineers to ensure features align with specifications, partnering with designers to craft a user-friendly interface, and collaborating with the marketing team to ensure effective product promotion (Oubrich et al., 2021). Another main responsibility is to respond to feedback and analyze data. It is important to continuously gather feedback from users and other stakeholders about the product. Not only this, but they also examine data about how users use products and then recommend changes accordingly (Bustinza et al., 2019). They are also in control of creating and maintaining a product roadmap. The term refers to a comprehensive document that outlines a product's plans throughout its entire lifecycle, from ideation to market

withdrawal. It is very important to create and maintain a roadmap so that all the members of the organization understand the current and plans for the product (Oubrich et al., 2021).

Manufacturing companies are shifting from a traditional product-based business model to a product service system (PSS) business model, which is based on selling a combination of services and products rather than an individual product (Bustinza et al., 2019). In addition to this, the PSS business model is based on the principle that it is no longer enough for manufacturers to compete by solely producing and selling high-quality products. And this happens because it is harder to differentiate products as they get increasingly like one another (Tortorella & Fogliatto, 2014), therefore companies have to monitor their customer selling services, integrated solutions and even experiences so that they can extract value throughout the value chain (Macke & Genari, 2019).

PSS business models may include some potential benefits, such as the fact that many organizations have primarily benefited financially from continuous services. Additionally, studies have shown that they have the potential to improve a company's environmental performance (Yang & Evans, 2019). Any kind of waste that is related to processes like maintenance and repair, can be properly managed through the PSS model (Oubrich et al., 2021), as well as resource and energy efficiency resulting in reducing carbon emissions. Since consumers pay for each use or service unit, producers are likewise motivated to improve resource and energy efficiency during the product's usage phase (Aggestam, 2006).

The outcomes-oriented PSS leads to increased recycling, remanufacturing, and reuse of products (in result-oriented PSS), especially at the end of the product lifespan. It is easier for manufacturers to collect used products and then develop advanced remanufacturing process designs and manufacturing techniques. It seems that this utilization of remanufactured products increases customer satisfaction and appreciation and, in many cases, reduces expenses (Oubrich et al., 2021).

Service management pertains to the set of processes, policies, and tools that an organization uses to ensure that its services are delivered efficiently and effectively to customers (Bustinza et al., 2019; Aggestam, 2006). This includes managing all aspects of the service lifecycle, from initial requirements gathering to ongoing delivery and support, as well as monitoring and measuring service performance to identify areas of improvement. Service management is significant for any business that depends on delivering quality services, such as in the IT, hospitality, or healthcare industries. Effective service management helps organizations optimize operations, cut costs, and enhance client satisfaction (Yang & Evans, 2019).

2.2. Service Quality

An organization's reputation and financial results can both be enhanced by measuring and improving service quality. Service quality has a direct impact on a business's capacity to satisfy client expectations and maintain its competitiveness in any industry (Albliwi et al., 2014). It takes research and experience to learn how to measure and enhance service quality, but it's a useful talent (Jiang et al., 2012). The degree of performance and satisfaction that a business offers its clients in terms of fulfilling their requirements and expectations is referred to as service quality. It encompasses all aspects of the services provided, including the attitude and behavior of staff, the reliability of service delivery, timeliness, responsiveness, and the overall experience of the customer (Abbas, 2020). High service quality results in increased customer satisfaction, loyalty, and retention, leading to greater revenue and profitability for the organization.

Measuring and improving service quality is essential to ensure customer satisfaction and organizational success (Para-González et al., 2016; Gürlek & Uygur, 2021; Abbas, 2020).

Service quality measurement is the process of evaluating how well a service meets customer expectations and needs. There are several ways to measure service quality, including:

- Customer satisfaction surveys: Customers' opinions regarding a specific service are gathered through these surveys. Questions may focus on factors such as responsiveness, empathy, reliability, assurance, and tangibles.
- Mystery shopping: Mystery shoppers are hired to anonymously evaluate a service by posing as customers. They may rate various aspects of the service and provide feedback on their experience.
- Net Promoter Score (NPS): With just one question, NPS is a metric that assesses customer loyalty: "How likely are you to recommend this service to a friend or colleague?". Responses are then classified as promoters, detractors, or passive customers.
- Service level agreements (SLAs): SLAs are agreements between a service provider and its customers that outline specific standards for service quality. SLAs may include metrics such as response time, resolution time, and uptime (Pakurár et al., 2019).
- Focus groups: Focus groups are moderated discussions that bring together customers to share their opinions and experiences with a particular service. These sessions can provide valuable insights into areas for improvement.

Overall, measuring service quality is an important part of ensuring customer satisfaction and loyalty. By regularly assessing service quality, organizations can identify opportunities for improvement and make necessary adjustments to meet customer needs (Para-González et al., 2016; Jiang et al., 2012; Gürlek & Uygur, 2021; Abbas, 2020).

2.3. Total Quality Management

According to Jiang et al. (2012), Total Quality Management (TQM) is a management style that prioritizes employee involvement and effective management procedures to continually improve the quality of products and services. TQM includes a commitment to customer satisfaction and to meeting or exceeding customer expectations by consistently providing quality products and services (Abbas, 2020). TQM has largely been acknowledged as a mechanism that can improve both the organization and individual performance while strengthening the competitive advantage (Albliwi et al., 2014). Not only does it increase the company's profitability, but it also increases customer and employee satisfaction. Total Quality Management aims to pursue practices that are environmentally friendly by consuming the least number of resources possible in its operations (Aggestam, 2006). Apart from its effective implementation, TQM has an important effect on the green innovation of enterprises and is a crucial sustainability factor (Abbas, 2020).

The concept of continuous improvement refers to the ongoing evaluation and enhancement of procedures to increase efficacy, diminish wastage, and elevate the general quality of services and products. TQM requires the commitment of top-level management to achieving quality goals and providing resources and support to ensure success (Gürlek & Uygur, 2021). Employees are engaged and encouraged to participate in the quality improvement process through training, empowerment, and involvement in problem-solving and decision-making processes. Also, TQM emphasizes the importance of efficient, effective, and standardized processes to ensure consistent quality. TQM has been widely adopted by organizations in various industries

and has been credited with improving product and service quality, reducing waste, and increasing customer satisfaction (Gürlek & Uygur, 2021; Abbas, 2020).

2.4. Maturity Assessment

Organizations can assess the quality of their processes with ease and effectiveness by using maturity models (Wendler, 2012). Maturity models are not limited to software-related fields; in fact, quality management is where the idea for them originated. In 1979, Crosby presented the idea that phases of development build upon one another, providing a straightforward but powerful instrument for analysis and evaluation. During the research, we will examine his “quality management process maturity grid,” which classifies the best policies along five maturity stages (Wendler, 2012; Hao, 2022).

According to Andersen and Jessen (2003), maturity models explain how an entity changes gradually. This entity could be anything of interest, including a person or a role within an organization. A systematic set of components characterizing the traits of efficient processes at various stages of development is called a maturity model. Additionally, it offers ideas on how to move between stages and where to draw boundaries (Lacerda & von Wangenheim, 2018).

Systematic mapping research is an appropriate method for this endeavor (Andersen & Jessen, 2003). As a particular kind of literature review, mapping research seeks to review a very wide-ranging subject by locating, evaluating, and assembling the goals, strategies, and contents of the primary research projects. Research gaps, the state of the field, and maturing subfields can all be discovered and described in this way (Wendler, 2012). A maturity model characterizes and ascertains the degree of completion or perfection (maturity) attained by skills. There is no restriction on where this idea can be applied. The maturity process can be described using either potential or expected enhancements (potential performance perspective) or a predetermined evolutionary path (life cycle perspective). As a result, maturity models provide simplified maturity levels or phases that use several sets of multi-dimensional criteria to assess how complete the examined objects are (Wendler, 2012; Hao, 2022).

R. Wendler/Information and Software Technology 54 (2012) 1317–1339

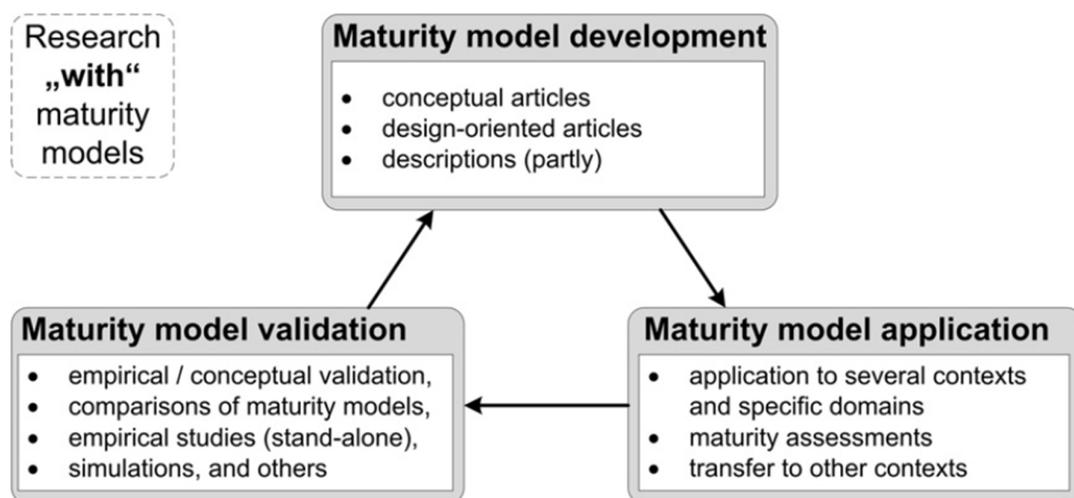


Figure 1. Maturity model development

Source: Wendler, 2012, p. 16

3. A PROPOSED MATURITY ASSESSMENT FRAMEWORK - MATURITY MODEL GLYKAS QUALITY COMPASS (GQC)

This section proposes the Glykas Quality Compass (GQC), a revolutionary holistic framework for quality management maturity assessment that has been used in many industrial sectors. The suggested GQC maturity assessment framework examines the effective application of quality management by examining ten important quality ideas. It is divided into four quality management perspectives: philosophies, frameworks, standards, and excellence awards. Management principles are seen in GQC as prerequisites or contributing elements to achieving the ten quality concepts.

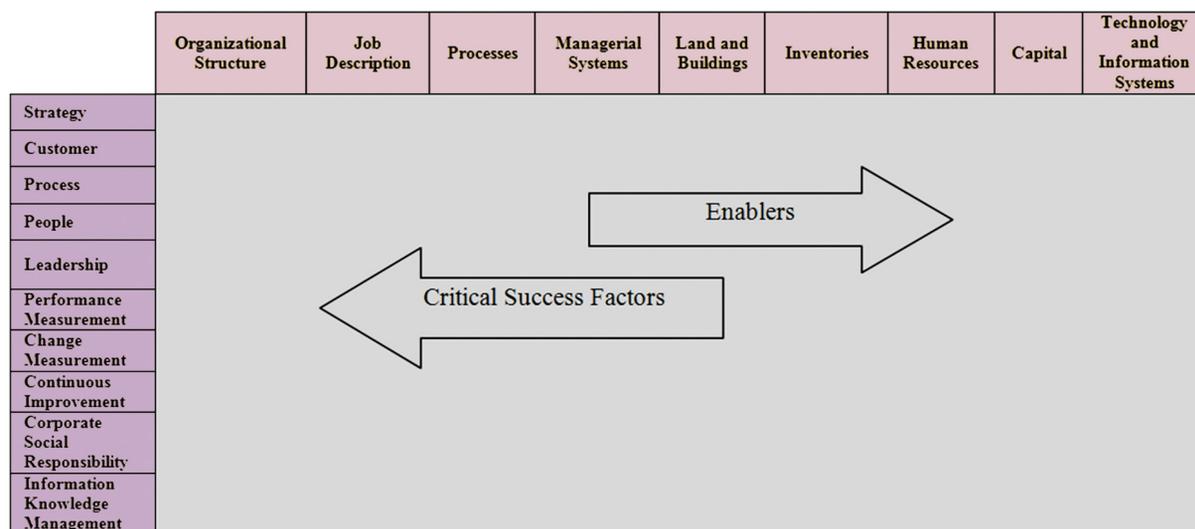


Figure 2. Glykas Quality Compass (GQC)

Source: Glykas, 2019

The ten quality concepts are further divided into three categories: two auxiliary concepts (collaborations and corporate social responsibility and information/knowledge management) and three intra-core concepts (performance measurement, change measurement, and continuous improvement). The five core concepts are customer focus, human resource management, leadership, process, and strategy (Bougoulia & Glykas, 2022).

4. CONCLUSION

This paper focused on research related to maturity assessment applied to the product-service process. Product and Service Management, Service Quality and Total Quality Management were also analyzed.

Our contribution presents a literature review of performance measures applied to the product-service management process. The main objective of the performance metrics literature review was to link these metrics to the proposed maturity model, Glykas Quality Compass (GQC).

Measuring the quality of a service involves assessing how well it satisfies the needs and expectations of the consumer. The quality of service can be measured in several ways, which are analyzed. The significance of Maturity assessment is also included in this paper.

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On the Risk Management in Land Consolidation Projects

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Abstract: Land consolidation (LC) as a power tool for land management is, in fact, a project of high complexity level. The high complexity of projects is a potential source of its failure. The complexity of land consolidation projects (LCP) is a consequence of the huge number of stakeholders, sensitivity of land ownership, and legal rights of land owners. The huge number of stakeholders causes a huge number of uncertainties because one stakeholder could have numerous interests and could not make the best decision in the situation of a sensitive relationship between different nuances in certain circumstances. Lack of reliable information could also be a source of risk for issues in the land consolidation project realization as well as the period of its realization. The duration of land consolidation project realization is another important factor that could cause problems or even failure.

1. INTRODUCTION

Complex projects are always at risk of failure. Lack of reliable information, numerous stakeholders, regulation, and duration of projects combined with unpredictable development in the project's environment could lead to different challenges. Land consolidation is an activity for the improvement of agricultural land use which includes a huge number of stakeholders and lasts for years. That characteristic of land consolidation projects implies the necessity of risk management inclusion in the process of land consolidation project realization. Another characteristic of land consolidation is its duration which could last for years. Figure 1 illustrates the participants as potential risk sources of land consolidation projects.

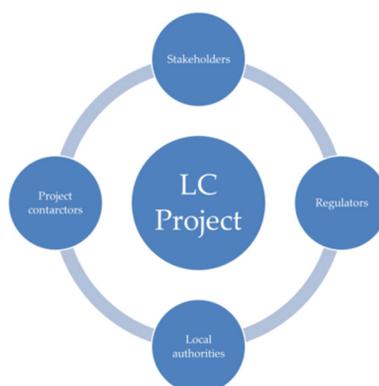


Figure 1. Participants in the land consolidation project

Source: Own research

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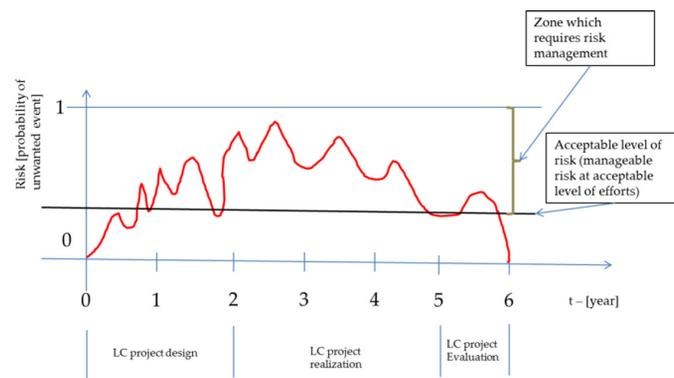


Figure 2. The risks during the life cycle of the land consolidation project

Source: Own research

Figure 2 illustrates the potential curve of risk during the life cycle of land consolidation projects.

The reasons for land consolidation implementation are well-researched and described in the literature. The positive effects of land consolidation encompass a wide range of benefits from its primary purpose to improve agricultural production to the support of sustainable development. According to the definition of land consolidation given by the [Food and Agriculture Organization of the United Nations \(2021\)](#), it is “a legally regulated procedure led by a public authority and used to adjust the property structure in rural areas through a comprehensive relocation of parcels, coordinated between landowners and users, to reduce land fragmentation, facilitate farm enlargement and/or achieve other public objectives, including nature restoration and construction of infrastructure.”

Land consolidation is the answer to the natural trend of land property fragmentation. [Niroula and Thapa \(2005\)](#) stated that the fragmentation of small landholdings and tiny land parcels negatively affects land conservation and economic gain and discourages farmers from adopting agricultural innovations. Land fragmentation is a factor of agricultural production limitation and limits rural development in many countries across the world ([Jürgenson, 2016](#)). [Thomas \(2006\)](#) defines the different types of land consolidation and their potential impacts are assessed including numerous positive effects of land consolidation. According to [Vitikainen \(2004\)](#), land consolidation is used as a tool for rural development in several countries in Europe with main utilization in Germany, the Netherlands, France, Belgium, Luxembourg, Austria and Switzerland as well as Finland, Norway and Sweden. According to [Burton and King \(1982\)](#), population pressure and partible inheritance lead to the fragmentation of land properties shaping the farm structure. According to [Crecente et al. \(2002\)](#), the arable area is a declining area of a parcel with a mean value of 2500 m².

According to [Wójcik-Leń et al. \(2019\)](#), land consolidation is recognized for its importance and effectiveness in the domain of land management but it is both an expensive and long-lasting project. This statement implies that, even though land consolidation brings a lot of benefits to the stakeholders, it is necessary to analyze it and make a decision about its final effects.

Analysing the characteristics of land consolidation it immediately follows that a decrease in the efficiency of agricultural land use is an inevitable process and that land consolidation is a necessary activity for maintaining the sustainability of agricultural land. Bearing in mind that land consolidation is “legally regulated procedure” immediately follows that it must be organized and conducted according to the law. The legal procedure means that the rights of stakeholders

must be taken into account during the land consolidation project realization. Literature research showed that this domain is lacking of papers dealing with this issue and authors will propose and develop a general model based on their own experience in practice.

2. PROBLEM DEFINITION AND PROPOSED SOLUTION

To start with risk analysis in land consolidation projects it is necessary to make an overview with general theories of risks tied to projects and after that to discuss the land consolidation issues. Pennock and Haines (2002) state that the size and complexity of projects both in the private and public sectors exceed the traditional management techniques for their control. Consequently, it leads to overrun costs, projects delay, and shortfalls performance of projects. This finding is very important in the case of land consolidation projects because land consolidation is a project that combines private and public interests which often could be in conflict. Figure 3 illustrates the relationship between public and private interest and the position of LCP.

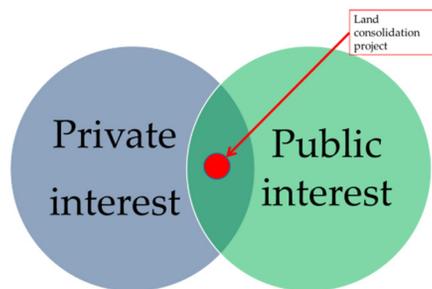


Figure 3. The position of LCP in relation to public and private interest

Source: Own research

In mathematical symbols it could be explained as follows: the LCP is realized in the intersection domain of private and public sets of interest. The following formulae explain it in mathematical symbols:

$$LCP = Pr \cap Pu \quad (1)$$

where:

- LCP – set defined by intersection of private and public interest
- Pr – set of private interests and
- Pu – set of public interests.

From the approach illustrated by Figure 3 immediately follows that LCP is in the chance of realization only if the interest of all three main participants exists. In the absence of any participant's interest, the LCP will not be realized nevertheless of other participant's interest. In this term, it could be stated that LCP could be realized only and only in the case when the interest of participants exists. This condition could be treated as “necessary” but not “sufficient” condition in the mathematical sense for LCP realization. The sufficient condition for LCP start is when all required conditions are fulfilled following legal procedure. From the formal decision of starting LCP the risks of its realization could arise due to different uncertainties. Uncertainties are inherent in any project because of the huge number of unpredictability of various factors especially in case of conflicting interests and unpredictable development of landowners' desires in the phase of LCP implementation. One source of potential risk for the success of LCP could appear

due to the public interest could predominate over private interest in case of a low level of legal regulation. The land owner in that case could terminate the LCP realization.

In general, there could be utilized different approaches for risk identification and its assessment. In the phase of LCP design, we propose utilizing the following two analytical matrixes:

- “probability-causality” and
- “required resources – required time for solution” matrix.

This approach assumes that in the pre-design phase of LCP, before the decision of LCP choice the SWOT (Strengths, Weaknesses, Opportunities, Threats) analysis has been provided, and some risks were identified. Proposed analytical matrixes could be applied during the LCP realization especially in cases when some issues appear that were unpredictable in the phase of LCP design.

Matrix “probability-consequence” means that the probability of an unwanted event is evaluated as “high” or “low” while the consequences are evaluated of “high significance” or “low significance”. Figure 4 illustrates the proposed analytical matrix for LCP risk analysis.

Probability-consequence matrix		Consequences	
		High significance	Low significance
Probability	High	I quadrant	II quadrant
	Low	IV quadrant	III quadrant

Figure 4. Analytical “probability”-“consequence” matrix

Source: Own research

The position of unwanted events which could occur in the process of land consolidation realization should also determine the strategy for dealing with risk. In the following text the interpretation of the issue position in the analytical “probability-consequence” matrix is explained:

- I quadrant: the probability of the event is high and consequences are of high significance. This event requires careful analysis as well as finding efficient strategies for its solution. In LCP projects there is inevitable conflict between private and public interest as well as the conflict within different landowners’ interests. The strategy for risk avoidance is to adopt risk and to try to find the most efficient solution.
- II quadrant: the probability of the event is high and consequences are of low significance. This event does not require special analysis. The strategy for risk avoidance is to neglect risk and to try to solve it by only explaining its low significance to stakeholders.
- III quadrant: the probability of the event is low and consequences are of low significance. This event does not require special analysis. This event could appear when the LC procedure is not well defined with the law that regulate LC procedure. The strategy for risk is to neglect risk and to solve it with minimal engagement.
- IV quadrant: the probability of the event is low and consequences are of high significance. This event requires special analysis. This event could appear when the LC procedure is not well defined with the law that regulates LC procedure. The strategy for risk is to take risk and to try to solve it in a consensual manner.

Matrix “required resources – required time for solution” means that scale of resources required for risk-reducing/eliminating is evaluated as “high” or “low” while the time for problem solution is evaluated as “long” or “short”. Figures 5 illustrate the proposed analytical matrix for LCP risk analysis.

Required resources-time matrix		Time for solving	
		High significance	Low significance
Required resources	High	I quadrant	II quadrant
	Low	IV quadrant	III quadrant

Figure 5. Analytical “required resources”-“required time for solution” matrix

Source: Own research

The position of unwanted events that could occur in the process of land consolidation realization should also determine the strategy for dealing with risk. In the following text the interpretation of the issue position in the analytical “required resources – required time for solution” matrix is explained:

- I quadrant: required resources are high and available time for problem solving is long. This event allows for providing resources in an organized manner. This case gives possibilities for planning the engagement of resources and their providing with acceptable costs.
- II quadrant: required resources are high and available time for problem solving is short. This event requires urgent action implying fast reorganization of available resources and acquiring the missing ones.
- III quadrant: required resources are low and available time for problem solving is short. This event requires urgent action implying fast reorganization of available resources without acquiring the additional ones.
- IV quadrant: required resources are low and available time for problem solving is long. This event does not require urgent action and existing resources should be enough for problem solutions.

Further development could include the combination of the proposed two matrixes (mutual combination of all four quadrants) but it overcomes the initial research and could be based on some cases in practice.

3. DISCUSSION

The proposed model of risk analysis and choice of strategies that could be implemented lacks existing literature about the issue (to the authors’ best knowledge). But authors’ knowledge based on experience from practice indicates that this issue deserves academic attention because of frequent problems appearing during the process of LCP realization. Opening this topic authors hope that it will cause some theoretical discussion and will result in research expansion on the issue.

We are aware of the potential shortage of proposed approach and their possible inaccuracies in concrete situations in practice. Also, this approach should be not adequate in all situations but, according to our experience, it could be a starting point for introducing risk management in land consolidation projects.

4. CONCLUSION

Land consolidation projects are complex and burdened by different sources of risk. Some unwanted events could lead to the LCP delay, cost increment, or even to LCP collapse. Bearing in mind the importance of LCPs’, the significant resources engagement, and expected benefits it is reasonable that, once started, LCP should be finished as fast as possible. This intention could

be improved by risk management introduced into the LCP. Authors have noticed (at their best knowledge) that this issue was not researched in the literature following its importance and tried to open this question and give a potential model for problem solution. Further research should encompass the analysis of cases from professional practice and improve the proposed model.

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On the Front Management of Land Consolidation Projects

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Abstract: Land consolidation (LC) is a complex process aiming to rearrange land property structure and improve land management. The process of LC implementation is complex on different levels including managing private, public and contractor activities in order to achieve predefined goals. The management dimension of LC includes the processes defined by legal procedures, harmonization of different often conflicting interests and the contractor's ability and available resources to realize the land consolidation project (LCP). The environment in which the LCPs' should be realized could be classified as turbulent, complicated and unpredictable. The environment of LCP is also burdened by different levels of authorities' jurisdiction which could also be overlapped. In that environment, the contractor should realize the LCP and achieve the predefined aims. This is possible only in case if the contractor establishes an adequate management hierarchy system concordant with the environment. This research is devoted to interpreting the authors' experience based on realized LCP under their leadership. This research encompasses the role of the front manager in LCP realization and its position in the hierarchy of LCP.

1. INTRODUCTION

According to the Food and Agriculture Organization of the United Nations (FAO), Land Consolidation (LC) is defined as “a legally regulated procedure led by a public authority and used to adjust the property structure in rural areas through a comprehensive relocation of parcels, coordinated between landowners and users, in order to reduce land fragmentation, facilitate farm enlargement and/or achieve other public objectives, including nature restoration and construction of infrastructure.” (Food and Agriculture Organization of the United Nations, 2021). According to Wójcik-Leń et. al. (2019), LC is a complex long-lasting process with great importance. According to Pennock and Haines (2002) the size and complexity of projects both in private and public sectors exceed the traditional management techniques for their control. This statement immediately follows that it could lead to overrun costs, projects delay and shortfalls performance of projects. This finding is very suitable in consideration of LCP because those projects include participants from the public and private sectors. The complexity of LCP increases the fact that the contractor (who executes the project) could also be treated as an interest group that protects its interest during the process of LCP realization. This situation is illustrated by Figure 1 which shows that LCP is realized in the intersection of three spheres of interest. The public interest is to provide the best possible effects from LCP for the common good and according to law procedures. The private interest is to obtain the best effects for each person itself and the contractor's interest is to realize the LCP with minimal cost to maximize its profit from LCP realization. Those interests (or stakeholders' goals) create a complex, complicated and turbulent environment for providing LCP. The complexity of the LCP environment arises from the numerous participants and their relationships, jurisdiction and legal procedures.

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Perplexity arises from the fact that changes in some LCP parameters could cause unpredictable consequences. Turbulences of the environment could arise from the different understandings of some issues' importance during the LCP realization process.

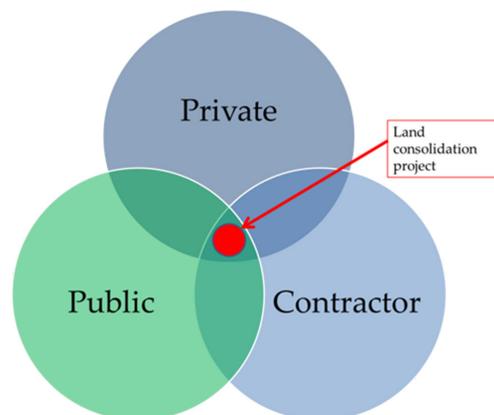


Figure 1. The sphere of interests

Source: Own research

From the aspect of the contractor, the process of LCP realization should be organized in a way that minimizes efforts, resource engagement and consequently costs. In previous papers (Trifković & Nestorović, 2017) and (Nestorović et al., 2023) the role and importance of leadership and management in LCP were discussed as well as the relationship between leadership and management during the LCP realization. However, researching some cases of LCP in progress authors concluded that the role of front management in the process of LCP realization was neglected. This research represents the attempt to role and importance of front management investigating in the process of LCP realization.

2. PROBLEM DEFINITION AND PROPOSED SOLUTION

The land consolidation process is a multidimensional activity dealing with landownership which is a very sensitive issue itself. During the process of land consolidation, the landownership should be transformed from the existing to the optimal structure including the land ownership rearrangement. During the LC process, the fragmented landownership should be rearranged changing the disposition, shape and parcel areas. This implies that landowners could feel uncomfortable and uncertain about the fair distribution of their land after the end of the LC process. These uncertainties and unpredictability could cause distrust among landowners and consequently could lead to problems during the LC realization.

Discussing the role and importance of this issue authors proposed the introduction of leadership (Trifković & Nestorović, 2017) and management (Nestorović et al., 2023) in the process of LC realization but, even though this approach had good results in practice, further investigation of showed that it was not the best model i.e. the conclusion was that proposed model could be improved. The shortage of utilized model was that the leader and manager of LCP were burdened by solving problems of low significance occupying their resources in a suboptimal way. Consequently, they spent their time and resources on the issues they were not enough familiar with i.e. with the issues they had not been informed about in detail. The role of a leader is to have a vision and to solve contextual problems (Trifković & Nestorović, 2017) while a manager should organize and control the LC process providing the required resources timely (Nestorović et al., 2023).

Because of the relatively huge number of landowners who participate in LCP during its realization, it is necessary to engage the front manager in the field who communicates with landowners on a daily base gathering information about landowners' priorities and intentions. Front managers should be educated enough to recognize the problem and its significance as well as to classify the problems and to be able to solve problems in their domain of responsibility. Problems that exceed the domain of the front manager's responsibility or problems that the front manager is not able to solve should be forwarded to the LCP manager. The front manager could use an analytical matrix with dimensions "Problem-Responsibility" to take adequate action. Table 1 shows the proposed analytical matrix.

Table 1. "Problem-Responsibility" matrix

Problem-Responsibility matrix		Domain of responsibility	
		Yes	No
Problem	Big	I quadrant	II quadrant
	Small	IV quadrant	III quadrant

Source: Own research

The position of the problem implies adequate action. In the following text the interpretation of the issue position in the analytical "Problem-Responsibility" matrix is explained:

- I quadrant: the problem is big and belongs to the domain of the front manager's responsibility. In this case front manager shall assess if the problem could be solved by available resources and if it is not possible the LCP manager should be informed.
- II quadrant: the problem is big and is out of the domain of the front manager's responsibility. In this case, the LCP manager should be engaged.
- III quadrant: the problem is small and belongs to the domain of the front manager. The front manager should solve it without informing the LCP manager.
- IV quadrant: the problem is small and it is out of the front managers' domain. The LCP manager should be informed.

The direction of communication/instructions is also important in order to divide the domain of responsibilities and instructions execution. The flow of information should be in the direction from the front manager to the leader and the flow of instructions is in the opposite direction. The front manager gathers information in the field in the daily communication with landowners, filters information solves problems in its domain of responsibility, and forwards information out of his domain to the manager. The instructions should flow in the opposite directions: the leader or manager makes decisions and forwards instructions for problem-solving and/or required resources providing. The leader and manager of LCP also provide the information in their domain of responsibility communicating with the participants in LCP delegated by authorities or dealing with the instruction based on regulation. The leader and manager of LCP also could be involved in problems that are in the domain of the front manager which overcomes its ability to solution finding. However, these situations should be rare and should not significantly occupy the resources of LCP leaders and managers. Figure 2 represents the direction of communication and information flow and the domain of responsibility for the leader, manager and front manager of LCP.

In the situation of literature lacking about this issue (according to the authors' best knowledge) the authors proposed this model and will include it in some LCPs' proposed way. The notifications during implementations of the proposed model should be made intending to prove the validity of the proposed model and to research its potential shortcomings with the main aim of improving it.

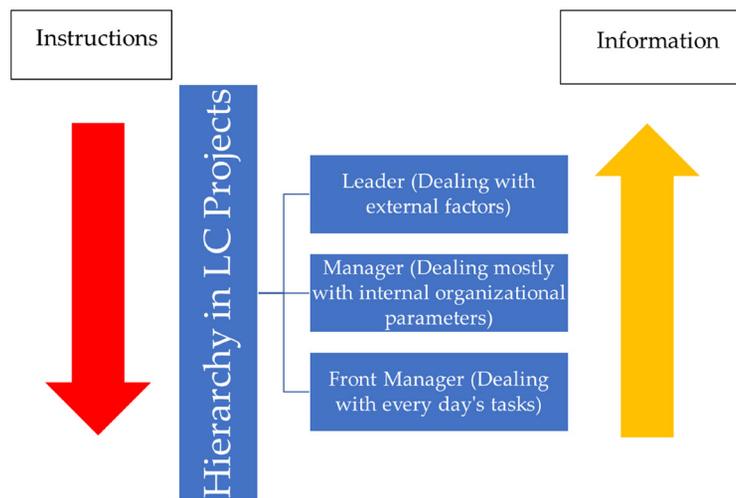


Figure 2. The tasks and flow of information/instructions

Source: Own research

3. CONCLUSION

Participating in some land consolidation projects (LCPs) authors noticed the importance of including the theoretical principle of leadership and management to improve the efficiency of LCP realization. After some successful results also some shortcomings were noticed especially inefficiency when the leader and manager had to deal with problems of small significance which could occur on a daily base during LCPs realization. This knowledge caused further theoretical investigation and resulted in the introduction of the front manager into LCP and the determination of its domain of responsibility as well as the procedure for its proceeding depending on the situation or problem classification. This theoretical approach should be checked in practice.

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Management Accounting in the Digital Era – One Accounting as Cloud Accounting Type

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Cloud computing;
Financial accounting;
Management accounting;
ERP (Enterprise resource
planning) systems



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Abstract: *In this article, the focus is on highlighting the point at which the digitization of management accounting has been reached in Romania, because accounting automation from its beginnings refers to financial accounting, as a form of accounting, mandatory to be organized from a legal point of view.*

Management accounting, as a form of accounting, is optional to be organized, in computer programs, it was only represented by a computerized section for stock management, without giving it the possibility of developing the object of study in his accounts of the 9th class of accounts, as well as financial accounting.

This shortcoming is covered, in the current context of accounting computerization and digitization, the particularities of the current digital accounting being of the cloud accounting type, which means one accounting that is performed using software hosted remotely on the cloud (internet).

1. INTRODUCTION TO FINANCIAL ACCOUNTING AND MANAGEMENT ACCOUNTING

The fact of separating the accounting into financial (general) and managerial (management) does not denote that within the organization has two accounts and various records. In specific European continental accounting system, within the Romanian companies/entities, there is only one accounting system, but it is built in a double circuit, in the same way, regrouping the initial data all users should be provided with such information that will help them make their decisions.

Financial accounting represents a system of collecting, grouping, reviewing and systematizing information regarding the existence and movement of assets, equity, debts, income and expenses in value terms for the preparation of the financial statements, in the General Chart of Accounts returning almost all positions, respectively accounts from classes 1-8.

Thus, financial accounting has as the object of study to evaluate the patrimonial elements of the companies/entities registration of all modification operations (increase or decrease) of the patrimonial elements, establishing the final results in the form of profit or loss, performing adjustments before the preparation of financial reports, making of inventory, drawing up trial balance, the preparation and presentation of the financial statements provided for by the legislation (balance sheet, profit and loss account, statement of cash flows, statement of changes/flows of equity and explanatory notes).

It can be seen from the above that the accounting information provided by financial accounting is an external one, its users being: investors, commercial partners (customers/suppliers), bank creditors, employees, state administration, and the manager.

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Management accounting is a system for collecting, processing, preparing and transmitting the information necessary for planning, calculating costs, checking and analyzing the execution of budgets, during the preparation of internal reports for managerial decision-making, in the General Chart of Accounts returning to the last position, respectively the 9th class of accounts.

Thus, management accounting has as the object of study to calculate the production costs of products, services, work, or activities, determine certain analytical results at the level of production subdivisions by product type, provide information for establishing budgets, providing information to determine the performance (profitability, productivity, etc.) of the different production subdivisions managing control and making management decisions.

The organization and functioning of management accounting is based on purely internal concepts and principles, its content is free of standards, being defined according to the company's conventions.

Accordingly, although the organization of management accounting is not mandatory, it benefits from separate freedom in terms of the possibility to adapt from each company, depending on the specificity of the activity and the need for information given this decision.

It can be seen from the above that the accounting information provided by management accounting is an internal one, its users being exclusively the manager, because the managers request more detailed information about important internal terms, such as the production process, the labor productivity, or activity reports, the role of management accounting is to provide that information. So, management accounting must be defined and analyzed as an integrated component in the decision-making process.

Starting from this premise, the importance of management accounting must be expressed, both through its automation and through its research, as a scientific discipline. According to [Lucas \(2020\)](#), current trends in management accounting research indicate a qualitative and upward evolution over the last few years (p. 2511). Her study describes the evolutionary research studies available in three digital libraries specialized in scientific research and was searched in Google Scholar, B-On, and Science Direct.

2. RESEARCH METHODOLOGY

The article is positioned to answer these research questions:

RQ1: Can management accounting be cloud accounting?

RQ2: How does management accounting become cloud accounting?

The answer to these questions is considered the purpose of the research, which required exploratory research for formulation and investigation, through the case study, of the following hypothesis: the existence of a link between the cloud computing characteristics of ERP (Enterprise Resource Planning) technology and management accounting.

Complementary to exploratory and instrumental research is the conclusive research, which allowed us to test and confirm the hypothesis.

3. FROM TRADITIONAL AUTOMATED ACCOUNTING TO DIGITAL CLOUD ACCOUNTING

The impact of information technology on the accounting system is that it provides new functions and tools for accounting procedures, causing positive changes in the accounting profession.

The definition of the informational accounting system is “a set of interdependent elements, oriented towards collecting, storing, processing, analyzing and transmitting information regarding the state and movement of the heritage” (Gheorghe & Roșca, 2004, p. 21), we can appreciate that the concept of accounting information technology refers to all software components and hardware used in computerized information systems.

The computerization of economic entities meant the creation of specialized programs that had to comply with the constraints imposed by the legislation.

In general, accounting computer systems are organized in such a way as to correspond to the accounting architecture in Romania, in which three major components can be noted financial – accounting and inventories (Vasilescu, 2008, pp. 15-16).

Regarding the computerization and digitization of accounting, it is known that the context of the current integrated technologies in the accounting field presents aspects related to technological futurology in accounting and the technological waves that the accounting field has experienced and will do. So, digital accounting manifests itself as cloud accounting, as a result of incorporating cloud computing technology into the entities’ informational accounting system.

Essential features of cloud infrastructures include on-demand self-service, broadband access to the network, shared resources, rapid flexibility and measurement tools of the quality of the service offered.

Cloud access is concurrently enabled to a large number of consumers through virtualization technologies with auto-scaling and automated provisioning functions based on the number of processing requests. From a theoretical point of view the amount of processing and storage resources that a user can benefit from is unlimited (Greavu, 2015, p. 18).

Cloud computing has revolutionized the way accounting software is delivered and utilized. Cloud computing does not have a standard definition, but the simplified general understanding is that of storing and accessing data and programs through a computer network, in particular the Internet, instead of a computer’s hard drive. In this context, the simplified definition of cloud accounting becomes an accounting that is executed using software hosted remotely on the cloud, instead of software that was, traditionally hosted locally on a desktop computer’s hard drive (Trencheva et al., 2023, p. 647).

4. CLOUD ERP AND MANAGEMENT ACCOUNTING AS CLOUD ACCOUNTING TYPE

In the context of the above, we ask ourselves the research question, can management accounting be cloud accounting? Yes, through Enterprise Resource Planning (ERP) systems based on the client/server architecture, developed for processing transactions and facilitating the integration of all processes, from the phase of process planning, and production development, to relations

with suppliers, customers, or other business partners. So, ERP fulfills the characteristic of the cloud computing concept, which is incorporated into the entities' accounting information system making it a cloud accounting type application.

ERP is a platform companies use to manage and integrate the essential parts of their businesses. Many ERP software applications are critical to companies because they help them implement resource planning by integrating all the processes needed to run their companies with a single system.

An ERP software system can also integrate planning, purchasing inventory, sales, marketing, finance, human resources, and more, like Figure 1:

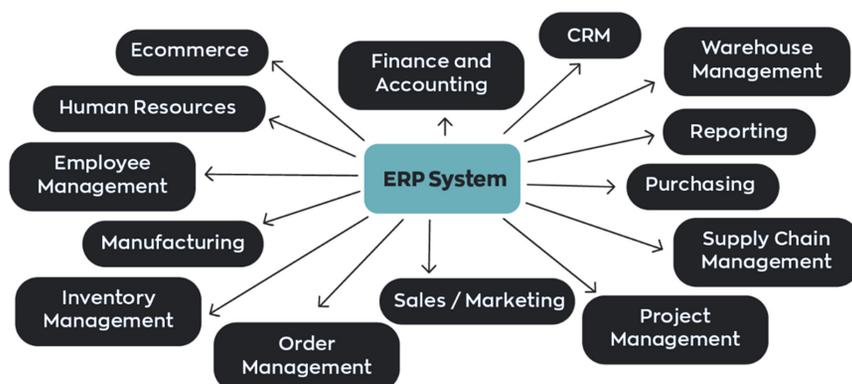


Figure 1. The integration of accounting in the integrated information system (ERP)

Source: Brandon, 2024

The second natural research question, in the given context, is How does management accounting become cloud accounting?

As we said before, in Romania the traditional automated accounting, using software traditionally hosted locally on a desktop computer's hard drive, did not give management accounting the possibility of developing the object of study in his accounts of the 9th class of accounts, as well as financial accounting.

This shortcoming is covered, in the current context of accounting computerization and digitization, when the accounting is executed using software hosted remotely on the cloud.

ERP is currently very successful in Romanian companies and their implementation brought the remodeling of management information systems. In addition, the position of management in organizations was reconsidered. Thus, ERP-type systems are currently tools that help companies and groups of companies to standardize managerial processes, and the manager is the user, exclusively, of the information provided by management accounting.

According to a study on the Romanian offer of ERP and software applications of accounting in the cloud, it was concluded that, the use of ERP Cloud is extremely reduced with the level of development and the size of the entities/companies and that at least the segment of medium and large entities is open to such technologies (Mihai, 2015, p. 65).

To support this connection between ERP and management accounting, as a cloud accounting type, we present an integrated IT system (ERP) whose user is S.C. BELSUINTEST S.R.L.,

(Limited Liability Company) which is part of the CARNEVO companies group. So, that means that it is one economic entity from the segment of medium and large entities.

The integrated IT program is called Iconsalt ERP Oracle and was developed in the Oracle platform by Naum Consalt S.R.L.

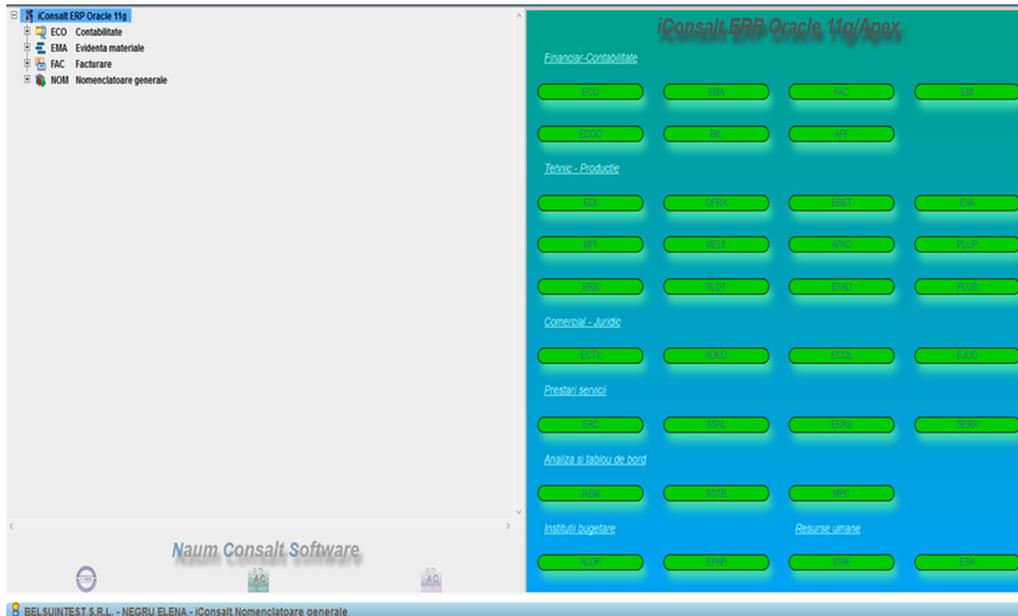


Figure 2. The program interface

Source: Own research

Through this program, the entity realizes the object of study of its management accounting, that is, the reflection in the accounts of the cost of production (like in Figure 2) and valuing cost information in the decision-making process.

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30	4	y	1	105 921.07	901		2682.85		L105D010			ROL	
30	4	y	1	106 921.16	901		371.00		LSEMP07			ROL	
30	4	y	1	121 921.01	901		1051.72		L108D010			ROL	
30	4	y	1	102 921.05	901		357280.00		L108D010			ROL	
30	4	y	1	123 921.05	901		3615.50		L104D010			ROL	
30	4	y	1	124 921.08	901		968.13		LTRANS07			ROL	
30	4	y	1	125 921.13	901		2542.00		LTRANS07			ROL	
30	4	y	1	126 921.14	901		1196.00		LSACRF07			ROL	
30	4	y	1	122 921.02	901		76847.87		L102D010			ROL	
30	4	y	1	60 921.14	901		104.00		LSEMP07			ROL	
30	4	y	1	70 921.02	901		8304.85		L105D010			ROL	
30	4	y	1	71 921.05	901		541951.85		LSACRF07			ROL	
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Figure 3. Account 901 Internal expense settlements

Source: Own research

5. CONCLUSION

One of the advantages of processing financial-accounting data, with the help of computers, is the quick access to the corresponding accounts. This advantage is also transferred to management accounting through ERP Cloud technology, whose use in Romania, is reduced at the level of medium and large entities, as is the case of the economic entity taken into this study.

The cloud computing characteristics of ERP technology allowed us to conclude that management accounting is one like cloud accounting type, thus giving it the importance that it deserves.

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Additional reading

- Accounting Law no. 82/1991, republished with subsequent amendments.
O.M.F.P. 1802/2014 for the approval of the accounting regulations regarding annual financial statements consolidated annual financial statement.



Digital Pricing Transformation & Pricing Technology

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Abstract: *This paper explores key trends in B2B pricing within the realm of digital technologies. The focus is on how pricing strategies in B2B markets evolve in response to digital transformation, especially in the context of contemporary trends such as the ongoing digital revolution. The discussion delves into the intersection of pricing and artificial intelligence, examining how AI technologies impact B2B pricing models. The research aims to provide insights into the intricate relationship between digital advancements and the transformation of pricing strategies in B2B sectors.*

Furthermore, this paper commences with a literature review and case study analysis to discern the impact of digital technologies on pricing models. Next, historical data and economic indicators are scrutinized to understand how businesses navigate pricing challenges during digital transformation. Lastly, the paper investigates the dynamics of pricing technology and its adoption in B2B markets in the digital age.

1. INTRODUCTION

Revolutionary business strategies, data analytics, and emerging technologies are drastically reshaping price administration in B2B markets. More and more firms are initiating digital pricing transformations to adapt to the ever-evolving macro and micro environments, seeking rapid and enduring value generation, and reinforcing and augmenting their competitive edge. To achieve efficacy, pricing transformations and the choice of pricing technologies must be rooted in a complete overhaul of the existing pricing process, taking into consideration the integrated business objectives and pricing tactics and addressing the specific demands of the company. Pricing has become a key element in new business models in the era of digitization. At the same time, price management is facing significant changes, opportunities, and challenges brought about by new business models, and the volume and quality of data that create entirely new potential. Technologies such as artificial intelligence, robotic process automation (RPA), and cloud applications for faster data analysis and storage often set the stage for comprehensive, real-time data-driven pricing (Beutin et al., 2020). Such changes not only impact business models but also create opportunities for competitive advantage and value-oriented products (Beutin et al., 2020; Karvounakis, 2021). Research shows that innovations in pricing are a potent but often underestimated source of success (Hinterhuber and Liozu, 2014; Copperberg & Vendavo, 2023). Innovative pricing models with the help of technological advancements are new pathways to achieving competitive advantage through pricing, which involves transforming transactional relationships into long-term partnerships (Cöster et al., 2022).

2. THEORETICAL BACKGROUND AND CONCEPTUAL FRAMEWORK OF DIGITAL PRICING

2.1. The Shift from Traditional to Digital Pricing: Drivers and Influencing Factors

Traditional pricing strategies have long been a cornerstone of commerce, encompassing methods such as cost-plus pricing, competition-based pricing, and value-based pricing, each with its

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unique approach. Despite the merits of these traditional methods, they also present significant limitations, such as a lack of personalization, inflexibility, an overemphasis on cost or competition, and limited data usage. This lack of data-driven decision-making can result in missed opportunities for profit maximization. Traditional pricing methods often fail to consider individual customer preferences, willingness to pay, or purchasing behavior, leading to suboptimal outcomes. In the increasingly digital and interconnected world, these methods have struggled to adapt to the evolving market dynamics and customer expectations.

The shift from traditional to digital and dynamic pricing is driven by several key factors, including globalization, increased competition, technological advancements, and E-commerce Growth. As businesses expand their reach, they must navigate different markets, customers, and economic conditions. Digital pricing allows companies to tailor prices to various regions based on local market conditions and consumer behavior. In highly competitive markets, businesses need to adjust prices quickly to maintain a competitive edge. Digital pricing enables real-time price adjustments based on changes in market conditions. The development of AI, machine learning, and big data analytics has made it possible to analyze vast amounts of data for pricing. These technologies enable businesses to accurately predict trends and customer behavior, allowing them to optimize prices accordingly. The contemporary consumer seeks personalized experiences, and this expectation extends to pricing strategies. Businesses can harness data and technology to devise personalized pricing strategies that cater to individual preferences. The e-commerce sector's growth has made price comparisons effortless for customers, compelling businesses to adopt competitive and dynamic pricing.

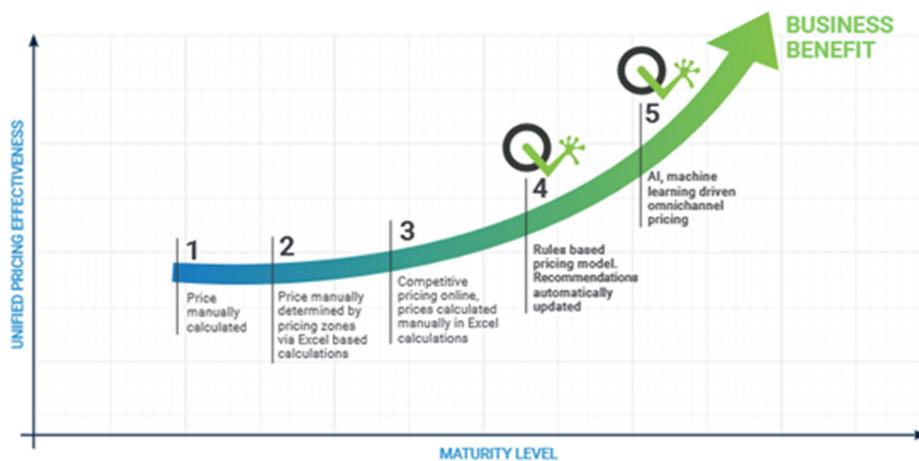


Figure 1. Evolution of pricing – from basic Pricing to Pricing model revolution

Source: Gartner, 2020

2.2. B2B Sales Transformations and Pricing Model Revolution

Digital transformation is a multifaceted process that consequently alters sales management (Guenzi & Habel, 2020). The boundaries between „Industry 4.0“ and sales processes are blurring, enhancing synergistic benefits, encouraging company representation, and leading to a strong competitive advantage. In the era of digitization, customers have easier access to information, and this process begins far before the buying phase. Decisions have become more rational, and market fragmentation has distanced companies from mass marketing, in some cases ignoring traditional media (Emmer, 2019). According to forecasts, up to 80% of the B2B interactions between buyers and sellers will be conducted through digital channels by 2025 (Gartner,

2020). However, many companies refuse to undergo digital transformation even though they recognize its significance (Guenzi & Habel, 2020).

The future of B2B market sales lies in consistent adaptation and transformation, underpinned by the synergistic connection among **Hyperautomation** (the application of a comprehensive suite of tools that mechanize and augment business procedures), **Digital scalability** (utilizing new capabilities and digital resources to help sellers evolve into digital-priority vendors and reform sales enablement practices), and **Artificial Intelligence** (shifting from predominantly analog decision-making to automated, algorithm-driven decisions, which assist in aligning sales procedures, channels, and seller competencies around customers) (Gartner, 2020).

According to Zatta (2023), the Pricing model revolution refers to a significant and transformative change in the way businesses approach and structure their pricing strategies. This revolution often involves the adoption of new methodologies, technologies, or innovative approaches to determine the prices of products or services. The foundation of this radical shift in how businesses capitalize on the value they offer their clients is made up of specific catalysts that Zatta (2023) classifies into four categories: technological innovation, data science progress, new ecosystems, and marketing of the future. These are the driving forces behind the pricing model revolution.

3. THE CONCEPT OF DIGITAL PRICING TRANSFORMATION

3.1. Digital Transformation and Automation – Trends and Preconditions

According to Dilmegani (2023), “digital transformation is the process of integrating digital technologies into all aspects of a business to respond to the market and changing business requirements. It aims to improve the efficiency of business operations and customer relationships. To achieve these goals, organizations need to update their systems, processes, organizations, and culture” (Dilmegani, 2023). Digital transformation pertains to the “process of using digital technologies to create new or modify existing business processes, culture, and customer experiences to meet changing business and market requirements” (Guenzi & Habel, 2020).

An IBM (2022) study found that 60% of organizations accelerated their investments in digital technologies due to COVID-19, and more than half (55%) have permanently adjusted their organizational strategies. They see that technology plays a key role in building resilience and adaptability, ranking it as the top external force that will impact their business in the near future, above regulatory concerns and market factors. Internet of Things (IoT, 79%), cloud platforms (74%), and artificial intelligence (52%) are the top technologies expected to deliver business results. The technology industry is one of the leading sectors in the world, with its share in global and regional GDP increasing annually. Experts identify the following leading trends in the industrial sector for 2023: Artificial Intelligence (AI), Blockchain, Robotic Process Automation (RPA), Industrial cloud platforms and XaaS, and Digital twins (Dilmegani, 2023).

New technologies make processes more manageable and efficient and, consequently, more appealing to price leaders (Lee, 2021). Digital transformation is a comprehensive expression denoting major technology-driven shifts across various business areas, such as human resources, supply chains, customer service, marketing, and finance systems. The forms of digital transformation can vary, ranging from integrating e-commerce features and introducing novel digital services to transitioning internal systems to the cloud. This change process should also be

viewed as an opportunity for innovation and improved pricing strategies (McCabe, 2023). Despite this, many companies refuse to undergo digital transformation, even though they recognize its importance (Guenzi & Habel, 2020).

3.2. Digital Pricing Transformation – an Overview

Digital Pricing Transformation refers to the modernization of pricing strategies and execution by leveraging digital technologies and data-driven insights. This is a significant shift from traditional pricing models, which are often simplistic, static, and lack personalization. Digital pricing transformation can help businesses overcome these limitations and tap into new growth opportunities. By leveraging technology, these new methods offer potential for dynamic, responsive, and personalized pricing strategies. A genuine digital pricing transformation signifies transcending beyond rule-regulated spreadsheets and abandoning the manual entry of competitor offerings into your database. It leverages dynamic pricing methods, as it auto-generates pricing guided by preset rules or data influenced by artificial intelligence (QuickLizard, 2021). Pricing transformations are adopted by organizations aiming to seize value rapidly and efficiently. This implies that B2B pricing proficiency hinges on precision, meticulousness, and speed, all of which are facilitated by Digital Pricing Transformations (McCabe, 2023).

Digital pricing transformation provides a wealth of advantages for enterprises aiming to maintain their competitiveness in the ever-evolving market landscape today.

Table 1. Key Advantages of Digital Transformation

	Advantages
Dynamic Pricing	The ability to adjust prices in real-time based on various factors, such as demand fluctuations, competitor actions, or customer behavior, can significantly boost revenue and profitability.
Increased Efficiency	Increased efficiency automation of the pricing process minimizes manual errors, improves speed, and allows businesses to react promptly to market changes, thereby enhancing overall efficiency.
Informed Decision-Making	An approach to pricing provides valuable insights into market trends and customer preferences, enabling businesses to make strategic pricing decisions.
Personalization	Digital pricing tools can segment customers based on their behavior, preferences, and buying history, allowing personalized pricing that enhances customer satisfaction and loyalty.

Source: Own processing

Digital pricing transformation can manifest in various directions and aspects, with its main expressions including:

- **Pricing Automation:** Pricing automation refers to the use of software or other digital tools to streamline and automate the process of setting, updating, and changing prices for products or services. This can be based on a wide range of factors, such as market demand, competitor pricing, cost of goods, and seasonality, and is often adjusted dynamically in real time. The goal of pricing automation is to improve efficiency, reduce manual errors, optimize pricing strategies, and ultimately increase profitability. This allows companies to make pricing decisions based on real-time data, analytics, and predetermined rules, thereby reducing the need for human intervention.
- **Dynamic Pricing:** Utilizing real-time data, algorithms, and AI to adjust prices dynamically based on various factors, such as market demand, competitor pricing, customer behavior, and time of day. This enables companies to maximize their profitability and

customer engagement. Dynamic pricing engines aim to pinpoint precise pricing that meets each company's objectives. For instance, an enterprise with ambitious profit targets will establish pricing meant to boost profits maximally, whereas a company favoring a larger market share will devise pricing designed to augment sales (QuickLizard, 2021).

- **Segmented Pricing:** Leveraging big data analytics to segment customers based on various characteristics (e.g., purchasing behavior, demographics) and optimize pricing strategies for each segment.
- **Price Optimization:** Advanced software and algorithms are used to determine the optimal price point that maximizes profit while maintaining customer satisfaction and market share.
- **AI and Machine Learning:** Utilizing AI and machine learning algorithms are utilized to predict market trends, customer purchasing behavior, and tailor prices accordingly. According to Gartner, the ultimate level of advantage is realized by integrating artificial intelligence (AI) and Machine Learning (ML) processes into pricing models. Algorithms can scrutinize customer behavior, enabling the system to propose the best pricing for each online engagement. AI and ML demonstrate considerable potential in the domains of inventory turnover and profit optimization. This technology comprehends how pricing influences sales and employs that knowledge to suggest perfect price points to achieve those objectives. Pricing at this stage spans across channels and incorporates extensive product data, pricing intelligence, and market data into its pricing suggestions (QuickLizard, 2021).

The goal of digital pricing transformation is not just to obtain the price right; it is also about enhancing customer experience, providing value, and driving business growth. Companies that successfully execute digital pricing transformations can achieve higher margins, improved customer loyalty, and a competitive edge in the marketplace.

3.3. Stages of the Digital Pricing Transformation Process

Digital transformation can impact all aspects of price management and allow innovative solutions throughout the different stages of the pricing process. Frohmann (2023) identifies the business model as the starting point of the transformation. The focus on the four components of the business model - target customers, customer value, value creation architecture, and profit model (especially „value to the customer“) - is crucial for the success of digital pricing (Frohmann, 2023; Hermann, 2015).

For the transformation to fully deliver its advantages, the pricing strategy, staff roles, and process routines must change. Upon completion of the transformation, the enterprise witnessed a refined pricing process and enhanced pricing levels. This transformation has also influenced sales and marketing. Together, teams need to comprehend the effect of dynamic prices on their sales and marketing plans (QuickLizard, 2021).

As per the experts at KPMG (2017), the path to digital transformation is a continuous voyage filled with iterative procedures and shifting objectives. Nonetheless, we endeavored to classify the transformation process into four general phases: defining a digital vision and strategy, constructing customer propositions, formulating business design, and planning execution. Every company and transformation will have distinct requirements; hence, decision-makers should initially comprehend their organization's specific core pricing challenges and necessities (McKinsey, 2021).

According to McKinsey's research, to ensure its success, the digital pricing transformation requires progression through the following six stages (Hudelson et al., 2021):

Stage One: Designing and building the necessary pricing processes for the company

This comes down to evaluating the current systems and understanding exactly what is needed for this to occur. It may even require a change in the price-formation process at each stage. Owing to the increasing variety of available channels and the adoption of a more dynamic approach to accounting, the assessment of pricing systems and tools currently in use is crucial.

Stage Two: Choosing a technology for digital transformation

Before evaluating technologies and tools, an organization's needs must be defined through the prism of customer value, and a pricing strategy should be formulated that best serves the business, taking into account the nature of sales, ordering methods, and manufacturing. Since discounting practices can vary significantly within a given business, dynamic approaches such as micro-segmentation can help reduce this variability and provide more informed discount guidelines to the frontline.

Stage Three: Assessment of existing systems

Organizations differ in terms of how ready their systems are to support price changes; therefore, it is beneficial to evaluate their maturity against clear criteria and industry indicators. This assessment can help companies to identify the most significant gaps between their current and future processes. At higher levels of technological maturity, technical tools can support a company's transition to omnichannel sales, especially e-commerce, which is becoming increasingly common in B2B sales.

Stage Four: Designing future systems

Formulated requirements for desired pricing tools and technologies are needed, along with improvements to existing technologies and investments in new tools and systems. Organizations with the lowest level of technological maturity can derive significant benefits from implementing basic pricing tools and processes for productivity management and embedding them in their customer efficiency management processes. However, companies with institutionalized customer efficiency management processes could improve their pricing strategy execution by integrating deal CPQ capabilities into their CRM tools.

Stage Five: Assessment of capabilities and implementation of a new system

To ensure alignment between the solution and business, companies must tailor each set of solutions to their specific needs and consider costs beyond the initial implementation. Not every transformation requires many new technical tools. While high-tech maturity companies may be able to extend existing systems, such as CRM, those with low technological maturity may find new solutions difficult to reproduce and scale. Mandatory transformation activities include a detailed project management plan, a test of the user experience of front- and back-office applications, and a system for measuring the impact of the project and its success. These measures can help institutionalize updated processes and key performance indicators and ensure that implementation is sustainable.

Stage Six: Maintaining the systems and their added value

After the initial transformation, maintaining the benefits requires an ongoing assessment of the efficiency of pricing tools. Companies must make changes as necessary to adjust and adapt to new needs (Hudelson et al., 2021).

Pricing transformation is not a one-time initiative but an ongoing process that requires continuous assessment of business requirements. Companies that understand how pricing technology impacts productivity and are ready to adjust wherever and whenever necessary reap far more benefits in the long run (Lee, 2021).

3.4. Challenges of Digital Pricing Transformation for Effective Implementation

Although the shift to digital pricing is full of potential, it also introduces several challenges that businesses must overcome. Several factors influence the successful transition from traditional to digital pricing (Table 2).

Table 2. Factors Influencing The Successful Implementation

Factors	Description
Data Quality and Data Management	High-quality data and data management are essential for accurate and effective digital pricing. Businesses must ensure that they have reliable data sources and robust data management processes. With digital pricing, the volume of data that businesses must handle increases significantly. Ensuring the quality, security, and privacy of data is a significant challenge.
Technological Infrastructure and Technology Adoption	Implementing digital pricing requires a solid technological infrastructure, including the necessary hardware and software, as well as integration capabilities with existing systems. Implementing new pricing technologies requires investments in terms of time, funds, and resources. It also demands technical expertise for successful implementation and integration with existing systems.
Change Management	Transitioning to digital pricing requires changes in business processes and may encounter employee resistance. Effective change management is crucial for ensuring smooth implementation.
Personalization	Digital pricing tools can segment customers based on their behavior, preferences, and buying history, allowing for personalized pricing that enhances customer satisfaction and loyalty.
Organizational Readiness	The shift to digital pricing requires change management including staff training, process changes, and potential restructuring.
Regulatory Compliance	When implementing digital pricing, businesses must consider the legal and regulatory implications, ensuring that prices are fair and non-discriminatory. Businesses must ensure that their pricing strategies comply with all relevant regulations in order to avoid legal complications. This can be particularly difficult when dealing with dynamic and personalized pricing models.

Source: Own processing

A successful transformation requires auditing internal data and systems, considering what external data are needed, and identifying new capabilities that can better meet the organization's needs. Digital transformation can be a double-edged sword. If not implemented correctly, it can lead to unsatisfactory results or even generate losses. According to experts from [KPMG \(2017\)](#), the key moments in the implementation of digital initiatives are the involvement of leaders, planning, execution and expectations of adoption. Results show that B2B companies are aware of the potential margin benefits and efficiency of digital engagement and automation, but only 7% plan to activate the process in the next 1-2 years and 31% in the next 3-5 years ([Rinn et al., 2021](#), [Allan, 2022](#)).

However, the operational application of “future pricing” poses significant challenges such as hiring new employees due to a lack of internal skills in the area of new technologies (49%), fear of negative customer reactions when changing the pricing model (53%), and above all, high investment costs for new technologies (54%) ([Beutin et al., 2020](#)). Digital pricing transformations have the potential to stimulate margin growth between 2% and 7% ([Lee, 2021](#)), but success depends on demonstrated leadership qualities and the commitment of key individuals. Tools and processes that are integrated with business objectives are necessary.

Digital pricing transformation is already being effectively employed across diverse industries. These examples (Table 3) provide a glimpse into how companies can leverage technology to implement dynamic, responsive pricing strategies that enhance profitability and customer satisfaction.

Table 3. B2B Companies Have Successfully Implemented Digital Pricing Strategies

B2B companies	Description
Grainger (n.d.)	A leading B2B industrial supply company, implemented a digital pricing strategy to optimize their long tail of products. They used advanced pricing software to adjust prices based on the competition, product type, and location. This granular approach allowed them to increase their overall profitability while maintaining customer satisfaction.
General Electric (n.d.)	GE uses advanced analytics and digital pricing software to optimize its pricing strategies across different product lines and regions. They take into account factors such as customer behavior, competitive landscape, and market dynamics. This digital pricing approach has helped GE realize more value for its diverse product portfolio.
BASF (n.d.)	One of the world's leading chemical companies has implemented a digital pricing system that allows them to dynamically adjust prices based on fluctuating raw material costs, supply-chain considerations, and market demand patterns. This has led to optimized profitability and improved response times to market changes.
Honeywell (n.d.)	Honeywell uses digital pricing tools to streamline pricing processes across its numerous divisions and product lines. By moving away from manual pricing methods, Honeywell has been able to make quicker pricing decisions, improve margins, and provide better pricing information to its sales team.
Cisco (n.d.)	Cisco, a worldwide technology leader, uses digital pricing tools and AI to segment customers and personalize pricing. They use data about customers' past behavior, business size, and potential value to offer tailored pricing and discounts. This approach has helped to increase revenue and improve customer relationships.
Hitachi (n.d.)	Hitachi changed the value creation architecture (“operating model”) in one of its B2B business units a few years ago. The business model was transformed from “selling products” to “offering software-based services.”

Source: Own processing

In each of these B2B instances, companies are leveraging digital pricing to make more precise, data-driven decisions. This shift not only helps in maximizing profitability but also in delivering an improved customer experience by providing more transparent and personalized pricing.

4. PRICING TECHNOLOGY AND KEY ELEMENTS TO ADOPTION

Pricing technology refers to digital tools and systems that companies use to plan, determine, analyze, and adjust their prices. Typically, these technologies leverage data, analytics, AI, and machine learning to optimize pricing strategies in a fast and efficient manner. By using digital technologies to optimize pricing decisions, improve customer experiences, and stimulate business growth, organizations can effectively respond to the changing dynamics of demand and supply in the digital age.

4.1. An Introduction to the Different Types of Pricing Technology Available Today

As the digital transformation of pricing continues to evolve, a variety of pricing technologies have emerged to facilitate this process. Digitization and automation as processes and phenomena contribute to and accelerate the trend for marketing analyses in the field of pricing and price formation

to not only be performed using Excel, SPSS, etc. but to be successfully implemented in management-accessible software, evolving in three directions: 1) pricing software; 2) marketing analysis software; and 3) forecasting analysis software. Many contemporary tools for marketing analysis can be useful in B2B pricing. The pricing tools range from those that handle simple automation tasks to sophisticated solutions that leverage advanced analytics, AI, and Machine learning (Table 4):

Table 4. Pricing Technologies

Pricing Technology	Description
Pricing Automation Software	Pricing automation software simplifies the pricing process by automating tasks such as data collection, price calculation, and price updating. This not only increases efficiency but also minimizes the risk of human errors and helps reduce manual interventions, saving time. Tools like Pricefx and Vendavo fall under this category.
Dynamic Pricing Tools	These are sophisticated tools that enable businesses to adjust their prices in real-time based on changing market conditions. They leverage real-time data feeds to monitor various factors such as demand, competition, and customer behavior. An example is the pricing algorithms used by ride-sharing apps or airline ticketing systems. Examples include Uber's surge pricing algorithm and Amazon's dynamic pricing tool.
Revenue Management Systems	Used predominantly in hospitality and airline industries, these systems help companies optimize their revenue by managing demand and adjusting prices accordingly. Systems like IDEaS, Duetto, and PROS are popular choices for revenue management.
Price Optimization Software	Price optimization software uses advanced algorithms and machine learning to determine the optimal price point that maximizes profit while ensuring customer satisfaction. It analyzes data on costs, competition, and customer behavior to recommend the best prices. These technologies use complex algorithms to analyze numerous variables such as sales history, product costs, competitor pricing, and customer demand. They then suggest the optimal price point that would maximize profitability. Tools like Zilliant, Pricemoov, and Pricefx offer such capabilities. Price optimization and management software is being increasingly used by B2B and B2B2C business models.
Predictive Analytics Tools	These tools use historical data and machine learning to predict future trends, customer behavior, and market conditions. This predictive capability can help businesses to proactively adjust their pricing strategies. Software like RapidMiner and Alteryx provide predictive analytics capabilities.
Competitive Pricing Intelligence	Competitive pricing intelligence tools monitor competitor prices and provide critical insights into their pricing strategies. They allow businesses to respond effectively to changes in competitor prices. Tools like Competera and Prisync offer such services.
AI and Machine Learning	AI and Machine Learning techniques are increasingly being integrated into pricing technologies to improve pricing decisions. They help in model complex pricing scenarios, predict outcomes, and continually learn from the results to refine the pricing models.

Source: Own processing

The pricing technology landscape today offers a wide range of solutions designed to cater to different business needs. According to [Gartner and Deloitte's \(2022\)](#) research among the most popular technological solutions for B2B pricing and price analysis for 2023 are: Deloitte Pricing Analytics, Periscope by McKinsey, Zilliant, Tableau, Power BI, IBM Watson Studio, SAS Marketing Automation, RapidMiner, Alteryx and Vendavo Pricing Solution. The choice of technology largely depends on the specific requirements, goals, and resources of the business. Businesses must select the technology that best aligns with their pricing strategy and overall business objectives.

The market for B2B Price Optimization and Management Software is projected to expand from a value of USD 479.00 Million in 2022 to reach USD 975.70 Million by the year 2030. This represents a Compound Annual Growth Rate (CAGR) of 10.70% throughout the forecast time-frame (Reportprime, 2023).

4.2. Key Elements and Important Factors by Pricing Technology Adoption

Adopting pricing technology can greatly enhance a company's ability to respond to market changes and make data-driven decisions, ultimately leading to increased profitability. However, before implementing any new technology, it is crucial to ensure *compatibility* with the existing IT infrastructure, including hardware, software, and other technological systems. Failure to do so may result in significant integration challenges and additional costs. Therefore, it is essential to have *clear business objectives* before adopting new technology, such as improving price consistency, increasing margins, or accelerating the pricing process. Pricing technologies heavily rely on data, so businesses must ensure they have reliable data sources and robust *data management* practices. This includes dealing with issues of data quality, security, privacy, and integration. To ensure successful implementation, businesses must carefully evaluate available pricing technologies based on their pricing needs, business objectives, and existing technology infrastructure. Considerations such as scalability, user-friendliness, and integration capabilities are essential. Successful implementation of pricing technology requires users to understand how to use it effectively, which includes *technical training and education* on new pricing strategies and methodologies enabled by the technology. The level of training and support provided by the technology vendor is a crucial factor in ensuring optimal usage of the technology. Comprehensive training and ongoing technical support can significantly smooth the transition process and ensure employees understand how to use the technology effectively (Bages-Amat et al., 2021). Transitioning to a technology-driven pricing approach often necessitates substantial modifications to business operations and may encounter employee resistance. *Effective change management* is vital to ensure seamless implementation and acceptance of the new technology. For many organizations, transforming pricing processes represents a significant shift. Thus, it is essential to manage this transition carefully, address potential resistance, communicate the benefits clearly, and secure leadership buy-in. Implementing pricing technology involves expenses associated with *acquisition, integration, training, and maintenance*. Thus, it is crucial to perform a thorough *cost-benefit analysis* to ensure that the expected benefits, such as improved efficiency, increased margins, or enhanced customer satisfaction, outweigh these expenses. Lastly, the pricing technology adopted must adhere to *all relevant regulations*, particularly those pertaining to data privacy and fair pricing.

5. THE FUTURE OF DIGITAL PRICING AND THE PRICING TECHNOLOGY

In the 21st century, the use of technology to develop business strategies, particularly in the realm of pricing, has become increasingly prevalent. The evolution of technology has revolutionized digital pricing, and this trend is expected to continue in the future. Digital pricing is poised to undergo further transformation as technology advances and consumer behavior changes. Although digital pricing has already made significant strides in the business world, its full potential is yet to be fully realized.

Artificial intelligence (AI) and machine learning are expected to play a significant role in the development of pricing strategies. These technologies enable businesses to analyze large volumes of data quickly and accurately, providing insights that human analysis may not detect. Dynamic pricing models, enabled by AI and machine learning, can adjust in real time in response to changes

in supply and demand, as well as anticipate such changes. As these technologies continue to learn and adapt, their predictive capacity will become increasingly precise (Deloitte, 2023; Gartner, 2021). A study conducted by Fortune and Deloitte (2023) among business leaders revealed that 80% of them believe that generative AI will enhance the efficiency of their business operations, while only 37% have implemented applications that utilize generative AI in their business. The rise of e-commerce and the widespread use of mobile devices for purchasing goods online will have a lasting impact on digital pricing strategies. To remain competitive, businesses are compelled to implement dynamic and competitive pricing approaches in response to price comparison tools and customer reviews available on these platforms. Furthermore, mobile devices will enable businesses to offer location-based pricing by harnessing geolocation technologies.

As businesses delve into the potential of blockchain technology, one possible application is to enhance pricing transparency. With this application, customers can track a product's pricing history, empowering them to make more informed purchasing decisions while fostering trust in businesses. The role of predictive analytics in B2B pricing is anticipated to expand significantly, as technological capabilities are integrated into optimization algorithms, scenario analysis, real-time pricing, and other systems such as ERP and CRM.

In the future, digital twins are likely to have a significant impact on digital pricing by offering a virtual replica or reflection of a product, service, or process in the digital world. The ongoing evolution and innovation in digital pricing and pricing technology necessitate businesses to continuously adapt and incorporate cutting-edge technologies into their pricing strategies to remain competitive. Nevertheless, it is essential for companies to carefully consider the ethical implications of these advancements and to maintain transparency and fairness in their pricing practices.

6. CONCLUSION

Digital pricing transformation is not a single occurrence but rather a constant evolution that necessitates a continual evaluation of business needs. After the preliminary transformation, the sustenance of the benefits demands an ongoing evaluation of the effectiveness of pricing tools, coupled with necessary adjustments to ensure long-term success. McKinsey (2021) states that digital pricing transformations have the potential to drive continuous margin growth between 2% and 7%. The benefits of these transformations are evident but rely on strong leadership from decision-makers and the implementation of pricing processes and technologies that consistently support business goals. The presence of tools and processes that align with the organization's future objectives is a crucial part of the puzzle. However, completing the picture requires the flexibility to respond to constantly changing needs.

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Investigating the Value of Sports Footwear Brands using Natural Language Processing Methods

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Abstract: *Determining the value of brands and comparing them by analyzing key elements such as identity, image and value is important for marketing measures and the branding of products or services. This paper presents research findings based on innovative methods for determining the significance and value of sports footwear brands. Natural Language Processing (NLP) techniques are used to analyze extensive text content collected from sports footwear-related websites. To determine the most relevant sports footwear brands, NLP techniques are used for topic modeling based on the Latent Dirichlet Allocation (LDA) method. LDA is an unsupervised method used to determine the topics addressed in the analyzed texts by extracting the most significant words in these topics. The importance of these identified brands in the text corpus is determined using the Semantic Brand Scores method, which uses graph theory to determine the importance of the brand in the text corpus based on three dimensions: prevalence, diversity and connectivity.*

1. INTRODUCTION

This article discusses methods for assessing brand values using an innovative approach to assessing its meaning, to improve brand management practices and marketing strategies. One way to assess the value of a brand's value is to consider its importance within the environment in which it operates and its encounters with competitors. The concepts of brand meaning and brand equity are linked in marketing. Brand significance refers to how important the brand is in the perception of consumers or within a particular market. This includes elements such as visibility, recognition and relevance to the target audience. Brand equity is built over time through various elements such as brand perception, loyalty, awareness and associations. A positive brand image often leads to consumer preference, so that the brand can command a high price and consumers remain loyal to it. The link between these two concepts lies in the fact that the significance of a brand contributes to the overall value of the brand. A brand that is perceived as significant often has a higher value because it enjoys a high level of awareness and recognition, as consumers generally prefer well-known brands. The importance of the brand is reflected in consumer perception. A more significant brand is seen by consumers in a positive context, which can lead to an increase in brand value. The impact on brand value is observed through consumer trust and willingness to pay a higher price for the brand's products or services. Companies use various metrics to identify opportunities for improvement to build a stronger and more valuable brand. These metrics include brand awareness, brand loyalty, brand association and financial indicators. Calculating brand value involves analyzing various marketing indicators from different sources using specialized brand value assessment tools. In addition to the traditional methods for measuring brand equity that are regularly used in brand-related marketing, modern methods are also used. These methods define a new metric for determining brand equity based on the analysis of text content available on the

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internet using Natural Language Processing (NLP). Natural language processing can help identify sentiment, trends and consumer perceptions of a brand, providing insights into the importance of the brand in a particular market or industry. In this study, NLP analysis was used for sports footwear brands. Various NLP techniques can be used to understand the importance of brands based on the analysis of text content downloaded from the internet. For example, count the frequency of mentions on different platforms. More mentions mean higher brand visibility and possibly greater importance. It is also very useful to understand the context in which the brand is mentioned. Are consumers talking about the brand's comfort, style, price or performance? This helps to understand which aspects contribute to the importance of the brand. By comparing mentions and sentiment between different brands, you can understand a brand's position relative to its competitors, which indicates its relative importance in the marketplace.

In this paper, the main part of the research is based on the innovative NLP method Semantic Brand Score (SBS) proposed by Colladon (2018). The SBS method determines the importance and ranking of brands based on a score resulting from the sum of the ratings of three parameters: prevalence, diversity, and connection. In order to apply the SBS method, the sports shoe brands mentioned in the web texts had to be identified. For this purpose, the NLP method of LDA topic modeling (Blei et al., 2003) was used, which identifies the topics represented in the text content and the brands associated with them. Since the SBS method only determines the importance and ranking of brands without considering consumer sentiment towards these brands, customer reviews were collected for the highest-ranked brand and a sentiment analysis was conducted. The customer reviews of the most important brands were analyzed using the NLP method of topic modeling to identify the most important topics that consumers expressed in their opinions. The research questions to confirm or refute the applicability of NLP text analysis methods in determining the importance of sports shoe brands were defined. The paper consists of five chapters. The first chapter presents the main issues. The second chapter discusses the problem and defines the research questions. The research methodology is presented in the third chapter. The results obtained are discussed in the fourth chapter and concluding considerations are made in the fifth chapter.

2. PROBLEM AND ISSUES

In this chapter, the main research problem is presented, the most important methods for NLP analysis of text content are explained and the research questions that are expected to be answered based on the results obtained are defined.

2.1. The Subject and Research Problem

When it comes to evaluating the impact of branding efforts and making decisions about future investments in brand management based on data, measuring brand significance is considered important to companies. In general, measuring brand value measurement is critical to understanding the impact of branding efforts on a company's performance and making positive decisions about future brand management investments (Aaker, 1996; Keller, 2013). Using a set of metrics to assess brand equity, companies can identify areas in need of improvement and gradually build stronger, more valuable brands. Brand importance is an all-encompassing measure of the value a brand has to an organization and includes metrics such as brand awareness, brand loyalty, brand association and financial performance. Brand value calculation involves analyzing various data sources and using specific models to estimate brand value. Most marketers rely on traditional approaches such as market research, surveys, interviews, financial indicators and monitoring social media posts to

determine metrics. In addition to these traditional methods, modern methods that use NLP to analyze text content available online are increasingly being used to determine the importance of the brand in determining value. This research focuses on analyzing brand significance and evaluating consumer opinions on sports footwear based on the processing of large textual data from the Internet. Given the vast amounts of text content on websites and social media, the opportunities to gather information and consumer sentiments related to sports footwear brands are limitless. The research objectives are linked to a new method for measuring and evaluating the significance of sports footwear brands through the application of Natural Language Processing (NLP) methods.

2.2. Natural Language Processing

Textual analysis is about understanding cultural, economic, social or ideological aspects contained in the essence of a text and how they are linked to a particular context. It should be emphasized that textual content falls into the category of so-called unstructured data, as opposed to data that can be represented in tables, for example.

In today's age of extreme amounts of text data, there is a need to combine various knowledge and skills that enable the transformation of complex and large unstructured data (Big Data) into useful and manageable information. Consequently, the process of text content analysis is no longer conceivable without the help of computer systems and tools that enable the automation of processes, simplify the observation of patterns and categorize the content according to pre-defined categories. This methodology enables the extraction of various characteristics of content such as names, countries, email addresses, authors, brand names and more. On the other hand, text analysis can be viewed through the lens of text mining, which is based on an interdisciplinary methodology of information retrieval using machine learning, statistical methods and computational linguistics (Sarkar, 2016).

The text can be described as a model consisting of basic lexical units of words and punctuation marks. The term used to label these units is 'text tokens'. The tokens in a text are arranged in a specific order so that the text can be modeled using a finite sequence of all words and punctuation marks. The entirety of the text model can always be placed in a context that further defines the meaning of the text. The biggest challenge in applying NLP methods and machine learning to text analysis is that computers, unlike humans, cannot calculate with words, but only with numbers. Therefore, before any text analysis, the words of the text must be converted into numbers, which are usually represented by multidimensional vectors, after pre-processing the content. To accomplish this, NLP experts have developed techniques known as 'word embedding'. They convert words into a numerical representation by mapping each word in a sequence (or sentence) to a vector space. The goal of word embedding is to determine the semantic meaning of words in a text sequence by assigning a similar numerical representation to words with similar meanings (Beysolow II, 2018).

The process of natural language text processing and analysis relies on a series of complex artificial intelligence algorithms, of which NLP is an essential component, as shown in Figure 1.

Before analysis, raw text content must be prepared in such a way that it is understandable for computer algorithms that have to extract specific features from the text (Nitin, 2015). The main steps of text preprocessing, shown in Figure 1, make the text data available for analysis after tokenization and word embedding by using various machine learning algorithms.

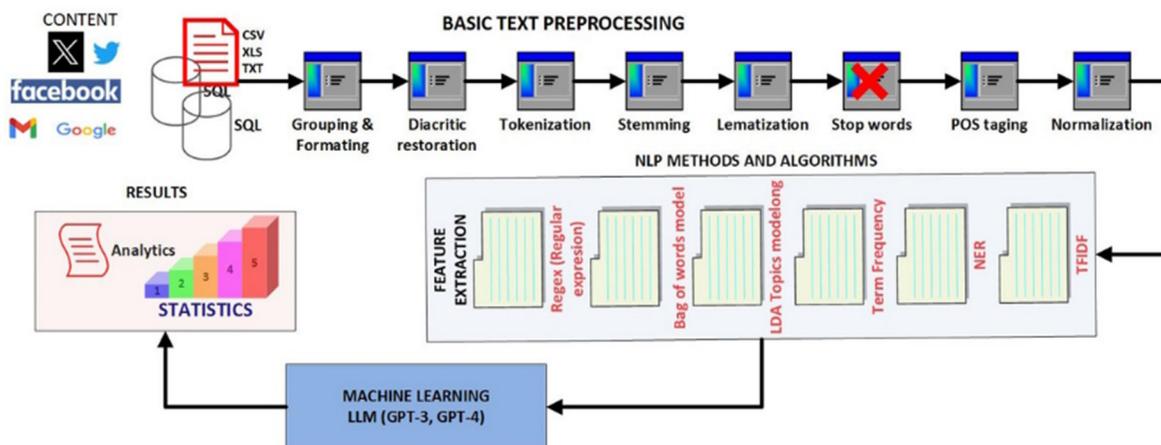


Figure 1. NLP process

Source: Own research

The research problems encountered in the application of NLP methods include extracting key brands of sports footwear brands based on topic modeling, determining the importance ranking of the identified brands using an innovative metric called Semantic Brand Score across three dimensions - prevalence, variety and connectivity, and analyzing the consumer sentiment for a sports footwear brand ranked as the best in the above analyzes, also accomplished using topic modeling.

2.3. Topic Modeling

Topic modeling is described as a method of unsupervised learning to determine the most important topics and the words associated with these topics. The KNIME model is shown in Figure 2.

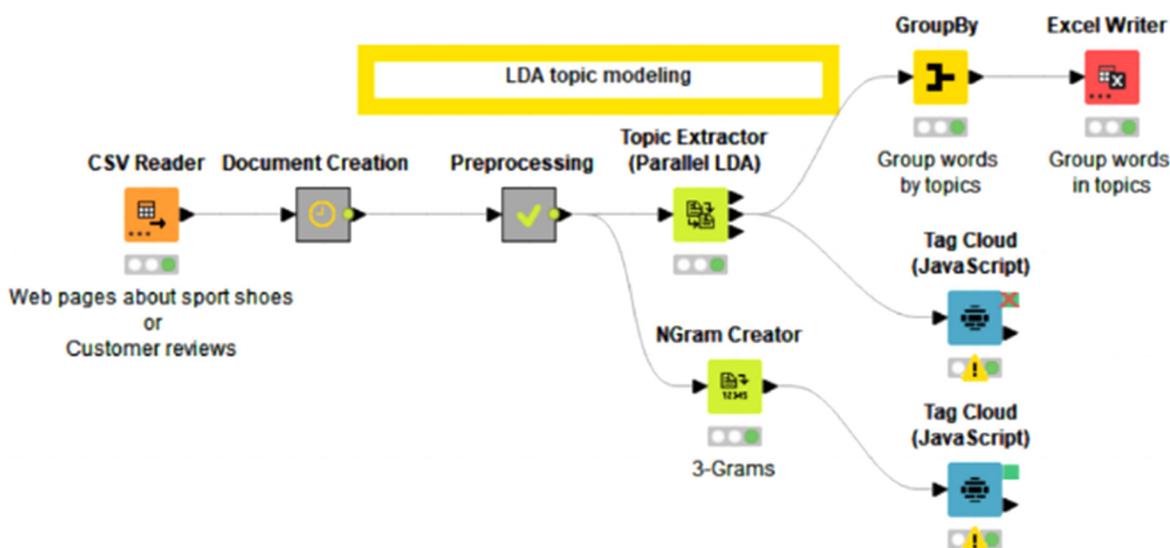


Figure 2. KNIME workflow of topic modeling

Source: Own research

Figure 3 shows that the process runs through the steps described above up to the module called Topic Extractor, which implements the unsupervised learning algorithm Latent Dirichlet Allocation. In this study, the number of topics, the number of words per topic and the predefined parameters alpha and beta must be defined. The parameters can be varied in several experiments to achieve the best result.

2.4. Semantic Brand Score

The Semantic Brand Score (SBS) is a new method for evaluating the significance of brands in different contexts by examining a large amount of text data, developed by Colladon (2018). Unlike traditional methods that rely on surveys of small groups of consumers, the SBS can be calculated from any source of text documents, including social media, blogs, internet forums, consumer opinions, emails and news articles. The goal is to gain real insights and signals by analyzing spontaneous expressions from consumers and other brand stakeholders. This approach minimizes bias that occurs in surveys where participants are aware that they are being closely monitored. The Semantic Brand Score metric is a technique that uses natural language processing (NLP) to analyze web content related to brands.

The effectiveness of SBS is demonstrated by Colladon (2018) in comparison to traditional brand equity indicators such as market capitalization and brand equity. The results show that the SBS provides a more accurate and comprehensive measurement of brand equity as it takes into account factors such as consumer sentiment, business reviews and brand relevance that are not captured by traditional measurements. It is mentioned that SBS can be a useful tool for companies and investors to measure and monitor the value of their brands over time and identify opportunities for improvement in their brand strategies. However, it must be emphasized that the SBS is not a perfect measure and that further research is needed to refine and improve the methodology. For example, the SBS does not take into account consumer sentiment towards the brand or brands, so sentiment analysis is required after the SBS score has been determined. The Semantic Brand Score method is based on a familiar mathematical data structure known as graphs or networks. Without diving deep into the mathematical description of graphs, a graph can be defined as a set of vertices (nodes) and edges (edges) and can be expressed as $G = \{V, E\}$ (Balakrishna, 1997). One of the most common applications is the analysis of relationships between participants in social networks. Analyzing social graphs can determine, among other things, the most influential people in a social network and the depth of connections through mutual friends. Graphs can also represent textual content, where vertices are words and edges are edges with co-occurring words, and they are used in the semantic analysis of SBS in this work. In the Semantic Brand Score (SBS) method, previously processed original documents are converted into a graph of concurrent word co-occurrences. After pre-processing the analyzed documents at the level of decomposing the text into tokens, i.e. individual words in a sentence, the SBS is determined by converting it into a graph of word co-occurrences. The graph is formed by connecting vertices (words) when one word precedes another within a range of five to seven words in at least one text document. Words that occur more than once create more edges in the graph. Multiple edges between two nodes are replaced by a single edge that is weighted by the number of multiple edges. The resulting graph is called a weighted graph, where the edges carry weights that indicate how often a word is connected to another word in multiple documents. An example of the described process of creating a word graph from the text of three sentences can be found in Figure 3.

The graph for the text provided illustrates how words are connected to other words and with what weighting when one word is connected to another several times.

The importance of brands is evaluated in three dimensions: prevalence, diversity and connectivity. Prevalence measures the frequency with which a brand name is used, i.e. how often the brand is mentioned directly. Diversity measures the variety of words associated with the brand. Connectivity represents the brand's ability to make connections between other words or groups of words. The final SBS score is the sum of the scores for these parameters.

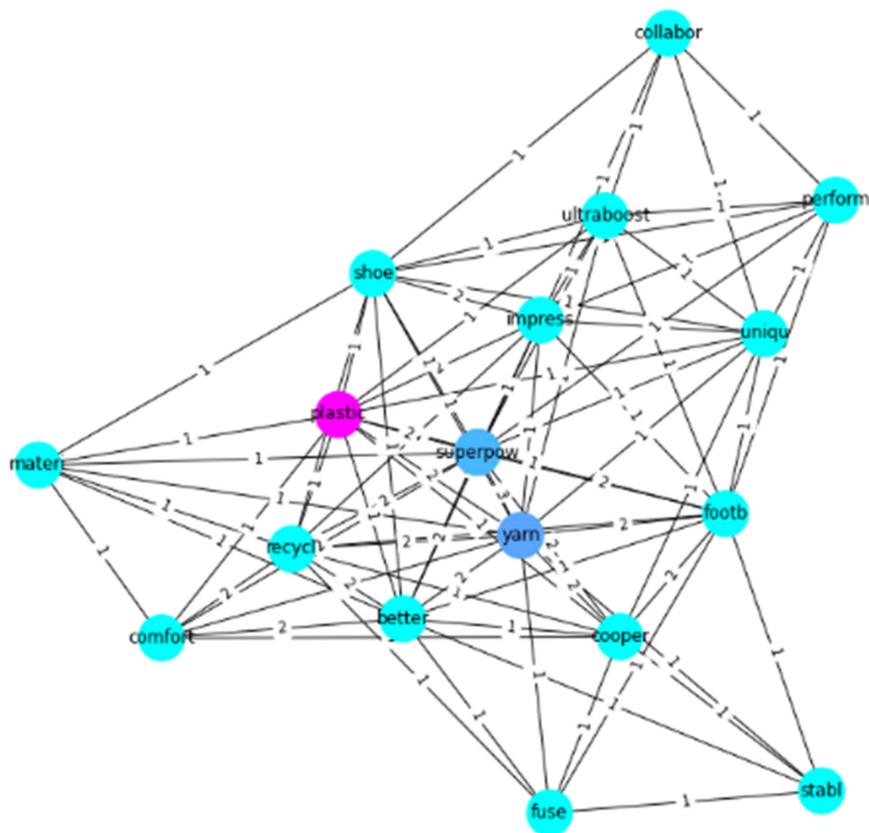


Figure 3. Example of word network

Source: Own research

2.5. Research Questions

The research questions are directly related to the problem that is the focus of this work, namely the evaluation of the importance of sports shoe brands using NLP methods to analyze text content from the Internet. The following three questions were raised:

1. How can topic modeling be effectively applied to extract and categorize the latent topics in textual data related to sports shoe brands, and what insights can be gained about consumers' discussions and preferences?
2. Is there a correlation between the ranking of brands identified through the semantic analysis of the sports footwear text corpus and the ranking of the financial value of the brands?
3. How can natural language processing (NLP) techniques be effectively used to analyze consumer sentiment and perception toward athletic footwear brands?

3. RESEARCH METHODOLOGY

For the study in this article, text content was collected from 57 different (publicly and freely accessible) websites such as Forbes, Finance Yahoo, LinkedIn, Money CNN and various blogs. Most of the content is from 2020 or 2021. The technique of web scraping using Python libraries was used to collect the text content. The collected text content was stored in Excel and CSV files as paragraphs, with each paragraph representing a single document. The total number of paragraphs, i.e. documents, amounted to 1660. On this basis, a research corpus with a large number of different text documents was created. This corpus was used for the NLP analyzes described in Chapter 2. For the sentiment analysis, consumer opinions were collected from portal websites

that collect data for various brands and services. Textual consumer opinions and ratings were also collected using web scraping techniques and stored in CSV and Excel files. The consumer opinions were collected only for the brand identified as the most important by the NLP analysis. A total of 424 user reviews were collected and categorized as positive (POS) and negative (NEG). The categorization was based on user ratings, with ratings 1, 2 and 3 categorized as negative (NEG) and ratings 4 and 5 as positive (POS). The study was conducted using the open-source application KNIME Analytics Platform, which was used to develop the study models. This application is based on the concept of “Low Code No Code”, which enables programming with modules that require minimal or no coding. The strength of this application lies in the numerous extensions for statistical analysis, machine learning and text processing. In addition to using the KNIME analytical platform during research and obtaining results, various libraries in the Python programming language were used, e.g. NetworkX for working with graphs in SBS analysis, BeautifulSoup and Request for web scraping purposes.

To determine brand importance, an innovative metric known as Semantic Brand Score (SBS) was used to evaluate words that represent brands based on three characteristics: prevalence, diversity and connectivity. The SBS analysis was performed using a basic Python program derived from Colladon (2019) and extended with additional code to work with graphs using the NetworkX library. For topic modeling, which aims to identify the most important brands mentioned in the texts, NLP methods were applied to determine the frequency of brand-related words that specifically refer to sports footwear brands. The Latent Dirichlet Allocation (LDA) method, an unsupervised machine learning algorithm, was used to analyze the content of the corpus and determine topics with similar related words or word clusters that occur frequently within specific topics. These analyses were carried out using the KNIME analytical platform. Before the analysis, the text corpus had to be cleaned and pre-processed, as shown in Figure 1.

4. RESULTS AND DISCUSSION

Using the technique of topic modeling, 6 topics were filtered out, the meaning of which is determined by keywords and which are shown in the following diagrams in Figure 4.

Topic 1: Consumer reviews		Topic 2: Sportswear and sports		Topic 3: Design and technologies		Topic: Brands and players		Topic 5: Brands, market and consumers		Topic 6: Market and Finance	
Key words (first 10)	Frequency (normalized)	Key words (first 10)	Frequency (normalized)	Key words (first 10)	Frequency (normalized)	Key words (first 10)	Frequency (normalized)	Key words (first 10)	Frequency (normalized)	Key words (first 10)	Frequency (normalized)
nike	0.19	adidas	0.15	cushioning	0.10	nike	0.20	nike	0.16	nike	0.15
reviews	0.12	sportswear	0.11	upper	0.08	adidas	0.10	adidas	0.14	sales	0.13
market	0.09	puma	0.08	sport	0.08	sneaker	0.08	armour	0.10	billion	0.12
adidas	0.09	founded	0.08	technology	0.08	players	0.07	consumer	0.06	adidas	0.11
analysis	0.08	reebok	0.08	design	0.07	jordan	0.07	fashion	0.06	market	0.10
women	0.06	athletic	0.07	performance	0.07	football	0.06	performance	0.06	growth	0.08
categories	0.06	accessories	0.05	comfort	0.07	million	0.06	consumers	0.06	revenue	0.06
customers	0.05	performance	0.05	trail	0.06	deal	0.05	innovation	0.06	million	0.05
report	0.04	range	0.05	lightweight	0.06	star	0.05	market	0.05	armour	0.04
price	0.04	athletes	0.05	foam	0.06	athletes	0.05	business	0.05	puma	0.04

Figure 4. Diagram of topics with keywords

Source: Own research

The previous diagrams can also be represented as a word cloud in Figure 5, that separates the keywords so that the words with the largest letters are the most important. Brands such as “Nike, Adidas, Puma, Under Armour, Rebook and Asics” can be recognized from the diagram. Of course, other words that provide the context for topics or brand names also appear there (performance, market, growth, billion).

The analysis of the collected customer reviews of the Nike brand, which is the most significant brand according to the SBS ranking, shows that 56% of consumers have a positive opinion and 46% a negative one. Based on this result, it is not clear what the consumers' opinions refer to. For this reason, an analysis of the texts of the opinions mentioned was carried out using the LDA topic modeling technique.

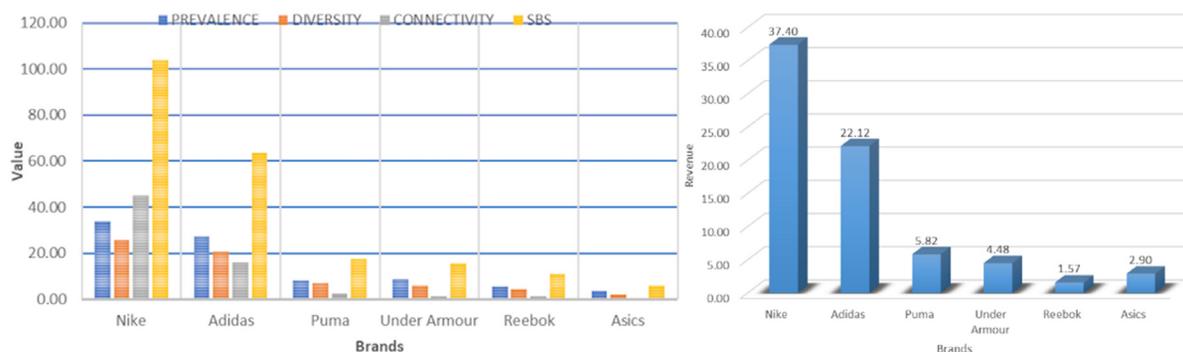


Figure 6. SBS scores and brands revenue chart

Source: Own research



Figure 7. Words cloud of 3-Grams

Source: Own research

Table 1. Topics and keywords identified from customer reviews

Topics	Key terms
Topic 1: Online shopping	label, return, available, shopping, website, shipping, complaint, stock, jacket, stars
Topic 2: Customer dissatisfaction	custom, disappointed, foot, white, normal, daughter, locker, quality, air, clean
Topic 3: Quality of Nike sneakers	nike, quality, love, pair, buy, bought, sneakers, comfortable, air, trainers
Topic 4: Nike customer online service	nike, customer, service, online, time, call, refund, com, money, experience
Topic 5: Support and refund	nike, support, american, buy, flag, country, decision, return, money, stand
Topic 6: Delivery and date of shipping	nike, delivery, days, told, gift, email, day, called, date, shipped

Source: Own research

Table 1 shows the distribution of the keywords, based on which the author has named 6 themes. Since individual keywords, although they determine the main topics, are not sufficient for understanding consumer opinions, three consecutive words in a row, the so-called N-grams, were also extracted from the analyzed texts, as shown in Figure 7.

3-Grams shows that the reviews are related to Nike customer service and the online store, and that consumers highlight key products such as Nike Air Force and Nike Air Max, but express dissatisfaction with poor customer service, especially because of slow product delivery and long waiting times for refunds due to the return of a bad product. This analysis also confirmed the third research question that NLP techniques can be effectively used to analyze consumer sentiment and perceptions of brands.

5. CONCLUSION

The research shows that the use of NLP methods together with traditional approaches such as financial reports and surveys can improve branding, public relations and marketing strategies for sports footwear brands. Using NLP methods to analyze brands in online texts can significantly improve the evaluation of their significance. By analyzing customer reviews, social media posts and other sources of customer feedback, NLP can provide insights into the effectiveness of a brand's marketing efforts, the quality of its products or services and the overall sentiment of the brand. NLP methods help to examine what consumers are saying on social media and create metrics for key brand assets such as awareness, sentiment and interaction. Examining customer reviews, social media content and feedback sources using NLP can provide insight into how well the marketing strategies are building the brand, the quality of the products/services and people's overall perception of the brand. The NLP methods used in this study, such as topic modeling, SBS analysis and sentiment analysis, help to gain a deeper insight into consumers' feelings towards the brand, its products or services and the effectiveness of its marketing strategies.

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Evaluating the Action Design Research Methodology for Requirement Analysis, Modeling, and Engineering in Information System Design

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Abstract: Action Design Research (ADR) as a sub-discipline of Design Science Research (DSR) is a mature research methodology used for the creation and formulation of artifacts that can contribute to information systems knowledge creation as well as in artifacts, design principles and theories valuable to practitioners. The core phases of the ADR consist in the iteration of the building-intervention-evaluation process and attempts to associate this process to value creation in industries have been made in different domains as the suggested literature advises. Yet these attempts have either a focus on understanding the potentialities of ADR rather than addressing possible implementation in a de-contextualized area of research or industry.

Requirement analysis, modeling, and engineering are commonly associated with the discipline of software engineering. However, according to the literature analyzed in this paper, the involvement of stakeholders and domain experts in this process has a significant impact. As an important phase of the system design process, it is essential to ensure that continuous, accurate, and unambiguously interpretative parameters, evaluations, and feedback from key stakeholders are appropriately integrated throughout the entire process of requirement analysis, modeling, and engineering.

In this paper, the authors evaluate whether the processes of requirement analysis, modeling, and engineering could benefit from the implementation of the ADR (Action Design Research) methodology. This research work explores the extent of these potential benefits and identifies the possible challenges that need to be considered in attempting to implement this methodology in the requirement phase of the system design.

The paper is organized as follows: it begins with an introduction of the research question and the challenges faced by the information system design team during the requirement analysis, modeling, and engineering phases. This is followed by a thorough literature review on Action Design Research (ADR), focusing on system design phases related to requirements and prior attempts to implement ADR in specific phases of information system design or related disciplines. Proceeding further with an evaluation of the impact that implementing the Action Design Research (ADR) methodology might have during the requirements phase of software engineering, along with conclusions and future work related to this research.



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1. INTRODUCTION

In the rapidly evolving field of information systems design, given mainly by the dynamic economic changes related to technology diffusion and infusion, the application of robust methodologies is critical for successful outcomes (El Sawy & Nanus, 1989). While there are several mature methodologies regarding the whole process of the engineering of the information system, a discipline mainly related to computer science, there is a complexity in acknowledging

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the multidisciplinary expertise needed in system design, especially in the phase of requirement analysis, modeling, and engineering. The multidisciplinary of systems has been noted to be an important factor in the engineering process of the information system (James et al., 2016) but this area of research falls outside the perimeter of the scope of this research. This research is mainly focused on evaluating the methodology of Action Design Research as a possible candidate for the requirement analysis, modeling, and engineering phase of the information system design and implementation lifecycle. As acknowledged in the referred literature, requirement engineering (IEEE, 2002) tends to be associated with the whole stages of analysis and modeling (Otuneme et al., 2023), if the multidisciplinary stakeholders come from different domains, with different approaches and little academic and theoretical background on Human-Computer Interaction challenges, can be encapsulated in the interaction during this phase between the engineering team and the practitioners.

Design Science Research (DSR) in Information Systems aims to develop innovative IT artifacts that solve organizational problems, contribute to theoretical knowledge, and ensure methodological rigor. It focuses on creating and evaluating models, methods, and systems that address practical business needs, while also enhancing the theoretical foundations of information systems. DSR emphasizes the importance of rigorous methods for artifact construction and evaluation to ensure their effectiveness and utility in real-world applications.

According to Hevner et al. (2004), both the design-science and behavioral-science paradigms are necessary for the relevance and effectiveness of Information Systems (IS) research. Hevner et al. (2004) also argue that the contributions of design-science research can be evaluated also in specific tools and methodologies for IS design such as the development of workflow verification tools and the extension of XML. Yet, the gap between the research-related approach and the practitioners needs to be addressed (Gregor, 2021).

Recent literature (Chatterjee et al., 2023) sheds light on the contribution that Design Science Research is having on research for developing new tools and systems for information technology, given that domain experts, practitioners and professionals from different domains and industries are working on new ways to solve problems with technology. Yet, the identification of the suitability for multidisciplinary, real-world problem-solving and collaborative research, is present mainly in ADR (Haj-Bolouri et al., 2018). Having identified the characteristics of ADR in terms of increasing the effectiveness of communication between researchers and practitioners, the authors of the paper aim to investigate and evaluate whether Action Design Research might be a suitable methodology for the requirement analysis, modeling and engineering phase of the information system design and implementation.

This paper explores the efficacy of the Action Design Research (ADR) methodology in the context of requirement analysis, modeling, and engineering in information system design. The research question of this paper is:

RQ1: Can Action Design Research (ADR) methodology improve the processes of requirement analysis, modelling, and engineering in information system design?

It is the authors understanding that such evaluation carried out from this research work can provide a valuable addition to the Design Science Research (DSR) discipline, especially to the extent of its usage in specific needs of the industry.

By conducting a comprehensive review of ADR literature and its role in system design phases, particularly in requirements, this study aims to offer insights into the iterative processes of building, intervention, and evaluation within ADR. The methodology chosen for this research is ADR, as it aligns closely with the discipline of interest in this research, which is predominantly action-oriented and design-focused. Through this research, we intend to highlight the significance of research analysis, modeling and engineering in system design and emphasize the importance of stakeholder and domain expert involvement in enhancing the outcomes of information system design.

The research work consists of an evaluation from the body of knowledge of the contribution that Action Design Research has had in various phases and types of information systems as well as an evaluation of the identified challenges that might arise when applied as a methodology in the collaboration between researchers and practitioners. From this literature review, the result of the evaluation of ADR for requirement analysis, modeling, and engineering is presented together with a suggestion on how it suits the three sub-phases related to the requirement macro phase of the software design and implementation.

An identification of the contribution of an ISDT is also performed in this chapter as well and a possible design principle is formulated.

Being a research work within the dissertation project of the first author of this paper, the future research work directions, drawn on the acquired results of this paper are provided.

Lastly, the paper presents the contributions and conclusions that fall mainly in the evaluation of ADR as a possible methodology for the requirement gathering, analysis and modeling during the information system design and implementation.

2. LITERATURE REVIEW

When initiating the design of the information system which in most cases does include the engineered software, there is a delicate phase of requirement gathering and analysis from the different stakeholders that might be of interest in or integral part of the usage of the information system itself. Such an interactive phase, of the identification of the functional and non-functional requirements of the system typically requires a domain analyst or domain expert who can abstract upon the specific need and think about solutions that might be universal to other needs of the same stakeholder or the same needs coming from different stakeholders. Typically, a solution architect who can transition from the business solution of the system to the technical solution of the software and of the technical architecture/environment where the system lives is also required in this phase. The Project Manager who enables the feasibility analysis, the cost analysis, and the timeline of the implementation of the project are one of the needed roles in the first phase of the system design and implementation: the requirement analysis, gathering and engineering phase.

Only by identifying the least substitutable roles during this phase, does the interaction between different roles with different technical, professional, and industry backgrounds become tangible, and the issues related to the augmented multidisciplinary of such collaboration is a problem that needs addressing to guarantee an output qualitative for the next phases of the system design and implementation.

Cultural changes, technical differences, linguistic barriers, technological variety of tools and communication methods are some of the factors that might increase the gap of collaboration between the stakeholders posing a serious threat to the product of this collaboration. (Alsulaimi & Abdullah, 2020).

Attempts to include machine learning techniques in bridging this gap and choosing the right technique for gathering system requirements have been made (Das et al., 2023) but the balance of data used to train the machine learning model remains a liability and a challenge to the effectiveness of the ML technique.

Yet, there is space for an improvement or even reengineering of techniques and methodologies that could increase the collaboration between stakeholders in this phase, increase transparency and understanding of the requirements from all parties, and evaluate the outputs with the scope to iteratively improve the process of generating such output and the output itself.

Action Design Research method, as illustrated in image 1. is based on four stages which consist in (1) problem formulation stage; (2) building, intervention, and evaluation stage; (3) reflection and learning stage; (4) formalization of learning stage. These BIE (building, intervention, and evaluation) stages could iterate in repetitive cycles where different stakeholders from the ADR team (researchers and practitioners) and the end users can participate in such iteration (Sein et al., 2011).

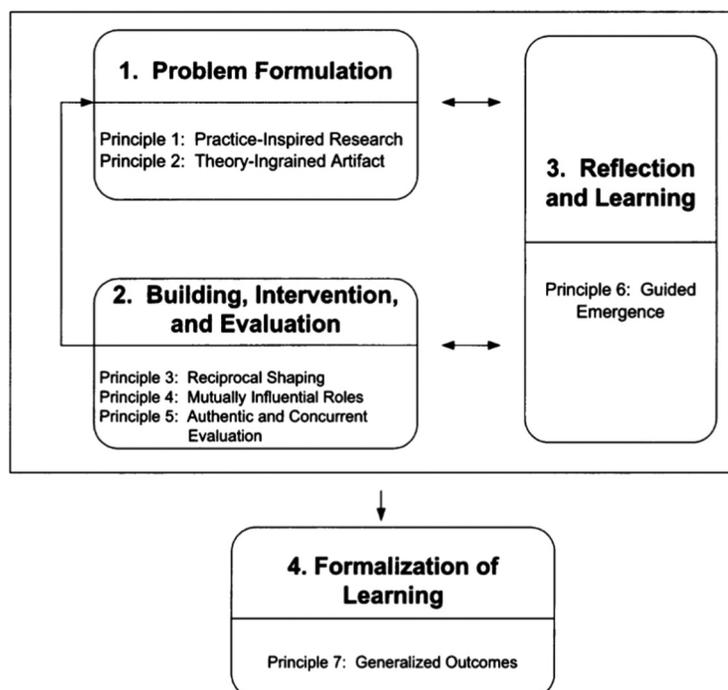


Figure 1. ADR method: Stages and Principles

Source: Sein et al., 2011

Given such acceptance of the participation of different stakeholders in the BIE stage, a natural parallelism can be drawn with the collaboration of different stakeholders in defining, analysing, modelling, and engineering the requirements of an information system.

According to the literature (Baskerville & Wood-Harper, 1996), the ideal use cases for action research include systems development methodology, indicating its usability in the requirement

analysis, modeling, and engineering phase of the system design. According to [Smith \(2015\)](#), there is a need for a broader definition of practice that includes both methods and processes and ADR can provide such contribution to develop and test new evaluation practices, enhancing both practice and general knowledge about professional evaluation.

There are important references in the literature of the attempts to evaluate the effectiveness of ADR in different ADR teams ([Haj-Bolouri et al., 2017](#)) as well as address challenges such as the balancing of practical problem-solving for industry partners and the generation of research outcomes for the academic community. [Haj-Bolouri et al. \(2017\)](#) identified the incremental delivery of IT artifacts as a key strategy used to address the previously mentioned challenge.

Also, the requirement gathering, analysis, and engineering are predicted an incremental activity upon the initial input, which is the requirement gathering, through all these stages, not only in the elaboration of the requirement itself but also in the abstraction process and the solution design for such requirement.

A very similar attempt such as the one posed by the research question of this paper, is found in the research article ([Cedergren & Hassel, 2022](#)) where the evaluation of the integration of Risk Management and Business Continuity Management in the development and implementation of a method for Risk and Vulnerability Assessment is successfully done through the ADR methodology. That study demonstrates also the practical relevance through a series of iterative testing and evaluation phases.

In this optics, since the requirement analysis, modelling and engineering implies addressing real-world challenges and the need for the creation of a method that is both theoretically sound and practically viable might be a possible approach to the formulated RQ. Such an approach results in a method that is adaptable to various organizational contexts, balancing the complexity of theoretical frameworks with the practical needs of users.

The evaluation of the usage of ADR methodology in engineering design ([Malou Petersson & Lundberg, 2016](#)) found that ADR was effective in structuring the study and facilitating the formalization of learning derived from it as well as it would provide authentic and concurrent evaluation. Nevertheless, when addressing limitations of the methodology the conference article states that ADR may not always lead to the best solution, but it is a valuable method for developing solutions optimized for specific contexts. Since the requirement “generation” phase is always contextualized, the previously indicated limitation of ADR can turn out to be an advantage for what is evaluated in this research.

3. RESULTS OF THE RESEARCH

According to the extensive evaluation of the literature where both traces the opportunities that ADR poses in enriching and facilitating the collaboration between stakeholders as well as in iteratively refining the processes and outputs by producing an artifact evaluated by all interested parties and enforcing a learning process, we have identified the possibility of using ADR methodology in the process of requirement analysis, gathering and engineering.

Based on the stages and principles of ADR methodology ([Sein et al., 2011](#)), an adaption has been done as represented in Figure 2.

Such adoption can be transposed also for the other cycles of Requirement Modeling and Requirement Engineering, following their principles but the same ADR stages. The utilization of Action Design Research (ADR) in the analysis, modeling, and engineering of requirements presents numerous advantages and difficulties. The iterative cycles of Building, Implementation, and Evaluation in ADR enable a dynamic approach to the development of requirements. Figure 3.

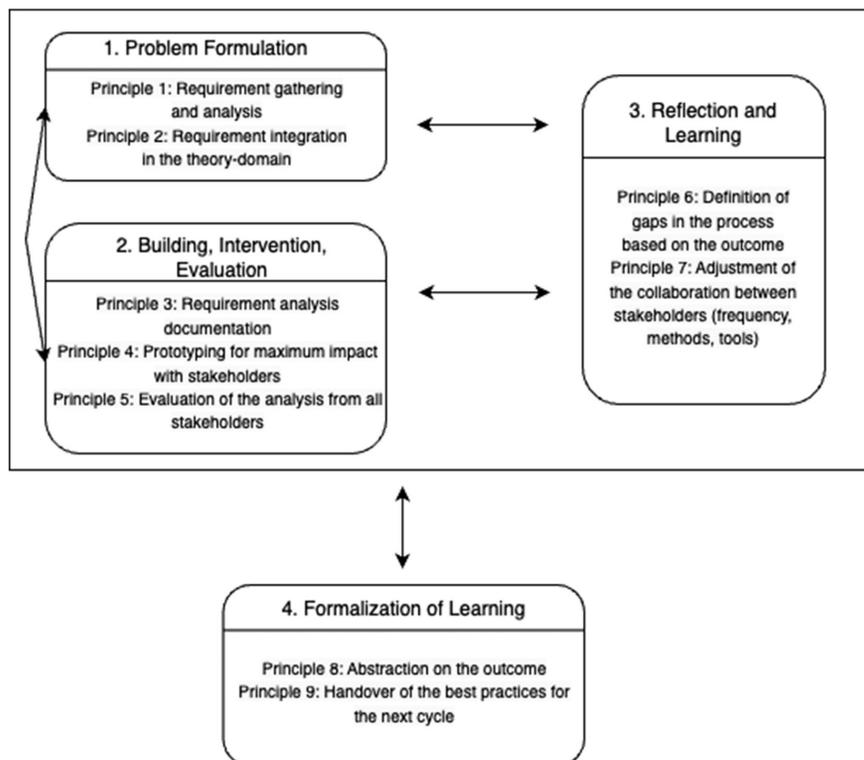


Figure 2. Adoption of the ADR methodology stages and principles for Requirement Analysis
Source: Sein et al., 2011

Within the framework of ADR Researchers contribute to the establishment of theory and ensure that the project adheres to academic rigor, while also incorporating practical insights. Business Analysts play a crucial role in the analysis of requirements, transforming business needs into technical specifications. Project Managers oversee the process, guaranteeing that it remains on track and within the boundaries of scope, budget, and time. Solution Architects are pivotal in the modeling of requirements, bridging the gap between the analysis of requirements and the technical design of the solution. Industry stakeholders offer real-world perspectives that can validate and refine requirements and design principles. End Users provide feedback that informs the engineering of requirements, ensuring that the final product meets their needs.

By conducting interviews with domain experts, the potential impact of ADR can be evaluated, revealing the contribution of each role to the overall process. These interviews are essential in comprehending how stakeholders perceive the advantages and challenges of ADR in practice and how it affects the resulting artifacts, including prototypes and minimum viable products (MVPs).

The contributions from the iteration of the BIE are seen in the Design principles formulation, on the improvement of the requirement-related processes and the engineering of a usable artifact valuable for the practitioners. The design principles derived from the iterative ADR process,

influence the wider field of design and development, and have an impact on the work of the ADR team, especially of the researchers included in such a team. The enhancement of the requirement process is reached through iterative learning and adaptation. Lastly, the engineered artifact can undergo improvements through continuous feedback from stakeholders and practical evaluation.

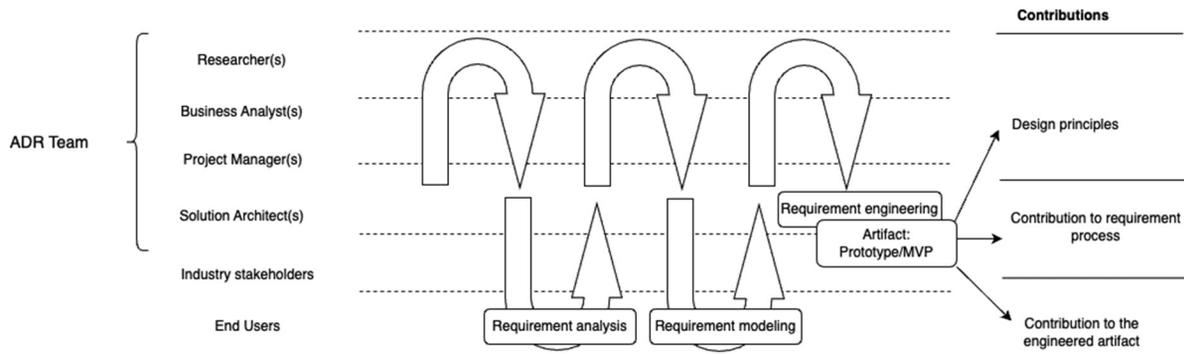


Figure 3. Adoption of the BIE cycle for Requirement Analysis, Modeling and Engineering
 Source: [Sein et al., 2011](#)

Based on the analyzed literature, on the synergies identified from the ADR stages, principles and BIE cycle with the Requirement Analysis, Modelling and Engineering during the System design and implementation, the authors can provide an answer to the research question “**RQ1: Can Action Design Research (ADR) methodology improve the processes of requirement analysis, modelling, and engineering in information system design?**”.

The methodology Action Design Research (ADR) has the potential to enhance the processes of requirement analysis, modelling, and engineering in the design of information systems through the utilization of iterative and reflective cycles. ADR facilitates a close and interactive involvement with real-world problems by incorporating the perspectives of end-users and industry stakeholders into the development process. This involvement is anticipated to result in a more precise elicitation of requirements, efficient modelling of solutions, and robust engineering of information systems. By encouraging ongoing collaboration among researchers, business analysts, project managers, solution architects, and domain experts, ADR endeavors to generate artifacts that are both firmly grounded in theory and practically applicable, thereby potentially enhancing the processes associated with the design of information systems.

Further evaluations need to be performed for the Requirement Modelling and Requirement Engineering ADR’s stages as well as feedback from practitioners and industry could enhance the accuracy of this work’s evaluation and provide meaningful insight to improving it further.

The evaluation performed in this research is based purely on the performed literature review on similar cases of the usage of ADR as a methodology for other different domains, and on the prior published work of the authors.

This research work does not propose ADR as a methodology for requirement analysis, modelling, and engineering, but evaluates whether there is ground in the body of knowledge of the application of ADR in similar or semi-similar domains.

4. FUTURE RESEARCH DIRECTIONS

In future related research work, the authors will perform a thorough evaluation of the Requirement Modelling and Requirement Engineering stages within the ADR framework as in this work such analysis is performed on the Requirement Analysis. This will involve a methodical examination of these stages, aiming to establish their effectiveness and pinpoint areas that may require improvement. The input of practitioners and industry experts will help evaluate the methodology in practical implementation, thus enhancing the validity and applicability of our findings.

Once the initial efficacy of ADR in requirement analysis, modelling, and engineering has been established, the subsequent phase of the investigation will concentrate on formulating a formal proposition that might be followed by a framework. This proposition will encompass the practical application of ADR across various domains, considering the diverse industrial contexts and technological frameworks in which it might be applied. The authors are aiming in future work to present a structured plan for the implementation of the ADR framework and incorporate key performance indicators and metrics to guide and assess the integration of ADR in real-world situations. By adopting this comprehensive approach, the research will contribute significantly to the current body of knowledge, offering a robust framework for the integration of ADR in the design of information systems in general and to the requirement phase in specific.

5. CONCLUSION

The research paper is focused on evaluating the effectiveness of the Action Design Research (ADR) methodology in the processes of requirement analysis, modelling, and engineering within the information system design. The study finds that ADR has the potential to positively impact these processes due to its iterative nature and stakeholder collaboration. However, the research acknowledges limitations, including its reliance on literature review and prior work, rather than empirical testing or evaluations from the cooperation with the industry. The paper suggests that future research should incorporate practical evaluations and feedback to refine the application of ADR in the field as well as further evaluations of ADR's stages should be done for requirement modeling and engineering.

The research sets the stage for future work that will explore the practical integration of ADR in diverse industrial and technological contexts.

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The Chaotic Productivity Growth Model: BRICS

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Abstract: *The BRICS countries are a group of five emerging markets and developing countries - Brazil, Russia, India, China and South Africa. Six new member countries (Argentina, Egypt, Ethiopia, Iran, Saudi Arabia, United Arab Emirates) will officially join the group in January 2024. The main aim of this paper is to analyze the productivity growth stability in the BRICS countries in the period 1991-2022. This paper confirms the existence of stable productivity growth in the observed countries in the observed period.*

1. INTRODUCTION

The BRICS countries comprise five emerging markets and developing countries: Brazil, Russia, India, China, and South Africa. In January 2024, the group will welcome six new member countries: Argentina, Egypt, Ethiopia, Iran, Saudi Arabia, and the United Arab Emirates.

Krugman (1997) states that productivity isn't everything, but in the long run, it is almost everything. Namely, a country's ability to improve its standard of living over time depends almost entirely on its ability to raise its output per worker.

Productivity can be defined as the measure of output per a given unit of input (labour, capital, land). There are different measures of productivity: i) Labor productivity; ii) Capital productivity; iii) Land productivity; and iv) Total factor productivity (the Solow residual). Labor productivity can be defined as the GDP ratio to the aggregate hours' employees worked or the Gross Domestic Product (GDP) per hour worked. Productivity is a key factor in economic growth.

According to de Vries et al. (2012), many factors have influenced productivity growth in the BRIC countries (Brazil, Russia, India, and China) from the 1980s onwards. Namely, structural transformation is an important factor in productivity growth. For China, India and Russia reallocation of labor across sectors is contributing to aggregate productivity growth, whereas in Brazil it is not. Mallick (2015) examines the reallocation effect and the direct effect of globalization on labour productivity growth in BRICS countries. Kurt and Kurt (2015) confirmed a positive relationship between innovation and labour productivity in Brazil, Russia, India, China, and South Africa in the observed period. Rehman and Islam (2023) created an index of financial infrastructure and measured its relationship with BRICS economies' total factor productivity (TFP) during 1990–2019. This paper shows the important role of financial infrastructure in total factor productivity (TFP). Abbas et al. (2023) examine the relationship between total factor productivity (TFP) and CO₂ emissions (CE) in BRICS countries from 1996 to 2022, with institutional quality serving as a moderating factor. They conclude that TFP is positively

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associated with CE. Also, they found out that the interaction between TFP and institutional quality has a negative effect on CE. [Shah et al. \(2022\)](#) examine the effect of carbon dioxide emission and air pollution on agricultural productivity in Brazil, Russia, India, China, and South Africa (BRICS) during the period 1990–2019. The result suggests that both carbon dioxide emission and air pollution negatively affect the productivity of the agricultural sector. [Qi et al. \(2023\)](#) examine the potential contribution of demographic dividends, digitalization, and energy intensity in facilitating the attainment of environmental sustainability and agricultural productivity in BRICS economies from 1996 to 2020. They conclude that digitalization improves agricultural productivity. On the other hand, demographic dividend and energy intensity contribute to environmental degradation.

2. THE SIMPLE MODEL

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

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

$$I_t = \gamma Y_t, \quad 0 < \gamma < 1 \quad (2)$$

$$Y_t = \delta L_t, \quad \delta > 0 \quad (3)$$

with : P- productivity, Y – the gross domestic product (GDP), I – investment, L- labour, α – the autonomous growth rate of productivity, β - the coefficient that explains the importance of the share of the gross domestic product that is used for investment for productivity growth, γ - the investment rate, δ - some fixed constant.

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

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

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

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

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

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

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

$$z_t = - \left[\frac{\beta \gamma}{(1+\alpha)\delta} \right] p_t \quad (7)$$

and

$$\pi = (1+\alpha).$$

Using (5) and (7) we obtain:

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

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

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

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 π ; (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 productivity growth stability in the period 1991-2022. in Brazil, Russia, India, China and South Africa. In this sense, it is important to use the logistic model (8):

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

where : $p = P / P^m$, P – productivity, $\pi = (1+\alpha)$, $v = (\beta \gamma / \delta)$, α – the autonomous growth rate of the productivity, β – the coefficient that explains the importance of the share of the gross domestic product that is used for investment for productivity growth, γ – the investment rate, δ – some fixed constant.

Now, the model (8) is estimated (see Tables 1-5).

Table 1. The estimated model (8): Brazil, 1991-2022.

Brazil	R=0.96408 Variance explained: 92.945%	
	π	v
Estimate	1.07639	-0.07820
Std. Err.	0.04941	0.05492
t(29)	21.78415	-1.42380
p-level	0.00000	0.16517

Source: Own research

According to Table 1., π was 1.07639. Further, according to the logistic equation (6), for $1 < \pi < 2$ all solutions monotonically increase. In this sense, productivity growth remained stable from 1991 to 2022 in Brazil.

Table 2. The estimated model (8): Russia, 1991-2021.

Russia	R=0.97960 Variance explained: 95.961%		
		π	ν
	Estimate	1.00224	0.014297
	Std. Err.	0.04719	0.058279
	t(28)	21.23834	0.245328
	p-level	0.00000	0.807991

Source: Own research

According to Table 2., π was 1.00224. Further, according to the logistic equation (6), for $1 < \pi < 2$ all solutions monotonically increase. In this sense, productivity growth remained stable from 1991 to 2021 in Russia.

Table 3. The estimated model (8): India, 1991-2022.

India	R=0.99687 Variance explained: 99.375%		
		π	ν
	Estimate	1.07183	-0.04221
	Std. Err.	0.02019	0.02639
	t(29)	53.07571	-1.59916
	p-level	0.00000	0.12062

Source: Own research

According to Table 3, π was 1.07183. Further, according to the logistic equation (6), for $1 < \pi < 2$ all solutions monotonically increase. In this sense, productivity growth remained stable from 1991 to 2022 in India.

Table 4. The estimated model (8): China, 1991-2022.

China	R=0.99983 Variance explained: 99.9666%		
		π	ν
	Estimate	1.1269	-0.08632
	Std. Err.	0.0069	0.00916
	t(29)	164.2335	-9.42418
	p-level	0.00000	0.00000

Source: Own research

According to Table 4., π was 1.1269. Further, according to the logistic equation (6), for $1 < \pi < 2$ all solutions monotonically increase. In this sense, productivity growth remained stable from 1991 to 2022 in China.

Table 5. The estimated model (8): South Africa, 1991-2022.

South Africa	R=0.97110 Variance explained: 94.304%		
		π	ν
	Estimate	1.04111	-0.034869
	Std. Err.	0.04777	0.056106
	t(29)	21.79643	-0.621484
	p-level	0.00000	0.539136

Source: Own research

According to Table 5., π was 1.04111. Further, according to the logistic equation (6), for $1 < \pi < 2$ all solutions monotonically increase. In this sense, productivity growth remained stable from 1991 to 2022 in South Africa.

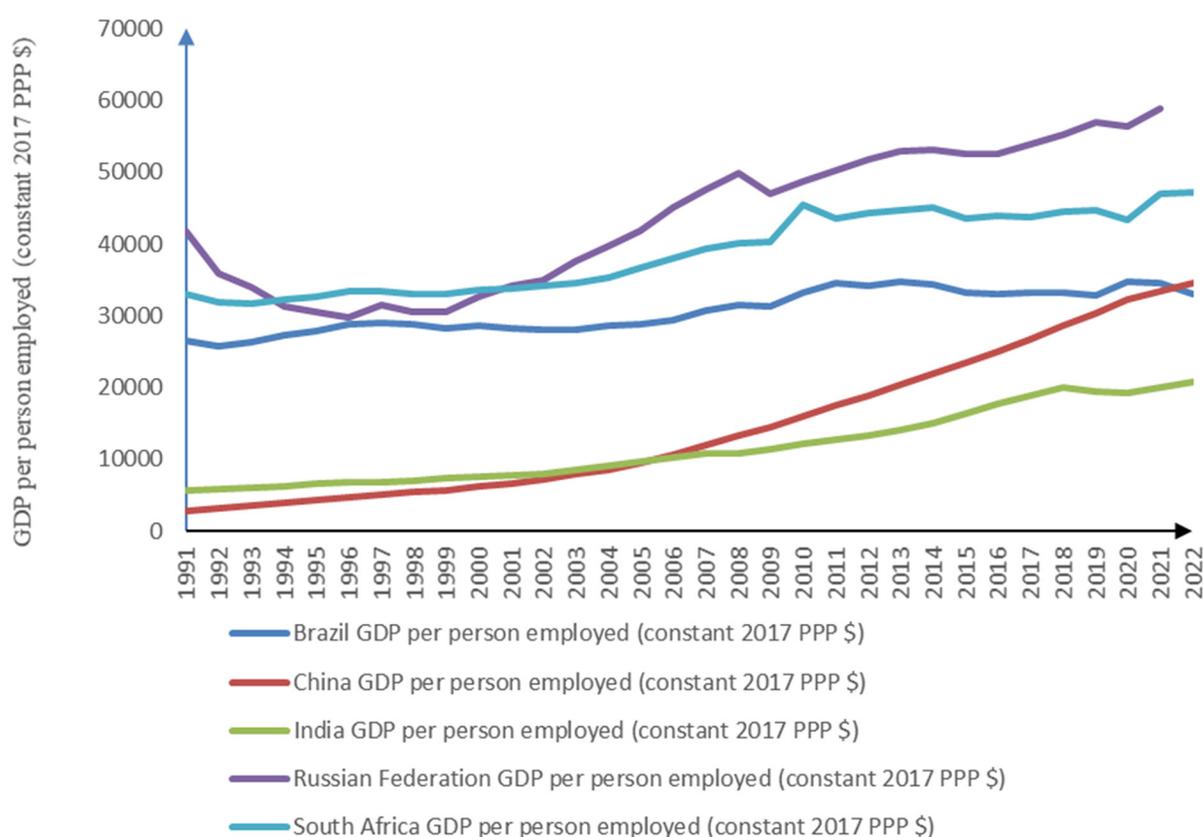


Figure 1. GDP per person employed (constant 2017 PPP \$): BRICS, 1991-2022

Source: World Bank, n.d.

5. CONCLUSION

This paper creates the chaotic productivity growth model. A key hypothesis of this work is based on the idea that the coefficient $\pi = (1 + \alpha)$ plays an important role in explaining the productivity growth stability, where, α – the autonomous growth rate of the productivity. An estimated value of the coefficient π confirms stable productivity growth in Brazil, Russia, India, China and South Africa.

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Convergence of Competitiveness and Economic Efficiency Amongst Western Balkan Countries

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Abstract: *This paper investigated the economic cooperation amongst the Western Balkan countries referring to competitiveness and economic efficiency. Through this analysis, it would be able to respond if the competitiveness and economic efficiency amongst Western Balkan countries will support the convergence to the Common Regional Market. Western Balkan countries should encourage innovation and knowledge transfer to contribute to economic growth and promote the facilitation of the creation of an intra-regional single market in the medium term. A unified regional cooperation mechanism would likely be more efficient according to Western Balkan countries to converge towards the expected results – in order to accelerate them related to the European Union integration process. The results of this paper will demonstrate the evaluation of the Western Balkans initiative and the expectations for the future through static and dynamic analysis amongst countries using diverse indicators of competitiveness and economic efficiency.*

1. INTRODUCTION

The Western Balkans as a region with about 18 million people, through regional cooperation, can jointly strengthen their economies, increase well-being and realize greater investments, which they would not be able to realize individually. Regional cooperation is seen as an important process to help the integration of countries towards the European Union. After the CEFTA agreement, one of the most important cooperation initiatives is the adoption of the Common Regional Market (CRM) plan, which is expected to catalyze a deeper regional economic integration and as a step towards the EU Market – of, based on the four freedoms of movement, the free movement of goods, people, services and capital. Regional integration by promoting competitiveness among countries is thought to increase convergence towards the EU. But competitiveness itself is a complex concept that requires work in many dimensions. OECD defines competitiveness as “the ability of a country to produce goods and services, which, under free market conditions, pass the test of the international market, increasing the real income of families”. The Commission of the European Union defines competitiveness between countries through the concept of a “high and growing standard of living for countries, which at the same time is followed by a low level of unemployment”. The World Economic Forum, (WEF), provides another definition and assessment of competitiveness, WEF assesses competitiveness based on the well-known index “Global Competitiveness Index (GCI)”, which is built based on a set of assessments of institutions, economic efficiency, public policies, macroeconomic stability, etc. In the following, this paper will analyze indicators of the competitiveness of the BP countries and evaluate the economic cooperation between them with the aim of convergence towards the path of the EU.

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2. LITERATURE REVIEW

The process of regional integration is an efficient way to improve and strengthen the competitiveness of the national economies of the countries being integrated. Regional integration as a process, creates the opportunity for firms of each country in the region to access a larger market. Based on the regionalization scheme according to [Matthews \(2003\)](#), regionalization consists of two important components: regional cooperation (an economic specialization among them) and economic integration (both market integration and policy integration).

Political integration requires a longer process to consolidate, but efficient economic integration should serve as a starting point.

According to [Balassa \(1965\)](#), 5 levels of economic integration are recognized which include: free trade, customs union, common market, and economic union which is related to the regulation and broader coordination of national economic policies to eliminate differences between countries in these policies, and lastly the full economic integration that concerns the unification of monetary, fiscal, social and countercyclical policies as well as the establishment of supranational authorities or the vision of a single non-federal state.

[Pelkmans \(1997\)](#) defines regional economic integration as the gradual elimination of economic borders between two or more countries.

A study by [Gorodnichenko et al. \(2009\)](#) on transition economies confirms the fact that exports and imports drive innovation, which in turn improves productivity and competitiveness.

[Bhawsar and Chattopadhyay \(2015\)](#) have researched within the reflections and orientations of the literature review regarding competitiveness at different levels. The authors point out that [Porter \(1990\)](#) argues that the only meaningful definition of national competitiveness is national productivity. Also, the authors show that [Moon et al. \(1998\)](#) defined national competitiveness as the ability of firms involved in value-added activities in a specific industry in a specific country to sustainably pursue the realization of added value over a long-term period despite international competition.

The [World Economic Forum \(2013\)](#) defines competitiveness as a set of institutions, policies and factors that determine the level of productivity of a country.

[Bhawsar and Chattopadhyay \(2015\)](#) conclude that the definition of competitiveness may change over time, but the primary purpose of its study remains almost unchanged. They emphasize that competitiveness is a key issue in the interest of academia, government and business, but its impact on different interest groups is different.

[Balkyte and Tvaronavičiene \(2010\)](#) emphasize the importance of research incentives to develop new concepts of “sustainable competitiveness” in the context of globalization, especially focused on the interaction of sustainable development and competitiveness.

[Kharlamova and Vertelieva \(2013\)](#) conclude from empirical estimates that the best way to influence the level of national competitiveness is to change the volume of the foreign trade balance of the respective country.

Rusu and Roman (2018) have researched the main economic factors affecting the level of competitiveness of Central and Eastern European countries (Bulgaria, Czech Republic, Estonia, Hungary, Lithuania, Latvia, Poland, Romania, Slovenia and Slovakia) during the period 2004 - 2016. Their empirical assessments show that many macroeconomic and business environment factors, such as Gross Domestic Product (GDP), inflation rate, trade, labor productivity and business costs are important factors of competitiveness for efficiency-oriented countries, while for innovation-oriented countries, determining factors of competitiveness are GDP, inflation rate, tax rate, foreign direct investment, trade and business costs. Also, they demonstrate that countries classified in transition have only GDP, inflation rate and labor productivity as determining factors of competitiveness.

Sadiku et al. (2019) empirically assess the effects of trade openness on the competitiveness of Western Balkan countries (including Albania, Bosnia-Herzegovina, North Macedonia, Montenegro and Serbia). Their empirical results show that there is a statistically significant positive relationship between trade openness and competitiveness for the countries analyzed. Also, the authors empirically prove that trade openness has a positive and statistically significant effect on innovation in the above countries. Meanwhile, the authors demonstrate that countries with a high level of foreign direct investment (FDI) and physical capital benefit more from international trade, thereby increasing competitiveness.

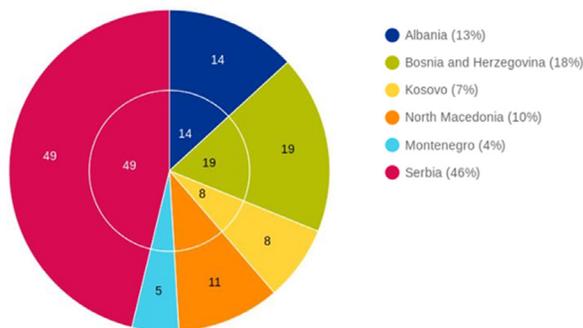
3. METHODOLOGY

The paper is based on a descriptive analysis of comparative statics and dynamics. Theoretical and empirical investigations have been used to examine and evaluate potential correlative determinants. The concept of competitiveness between countries is rather broad and multi-dimensional. There is no single indicator or index to characterize the content of this concept, therefore the assessment of competitiveness and economic efficiency between countries remains a complex assessment. In this paper, some indicators of the economic status and competitiveness of the countries and the comparison between them will be analyzed. For this study, the data is taken from the database of the “Vienna Institute for International Economic Studies” (WIIW), as well as the World Economic Forum. This Research can be considered primary and secondary using primary and secondary data.

4. ANALYSIS OF COMPETITIVENESS INDICATORS

The stages in which the economic integration of EU markets has passed include Free trade area FTA, Customs union CU, Common market (CM). In the same analogy, the EU has completed market integration and started the process of policy integration, while the countries of the Western Balkans are in the market integration phase. The first step, which is the liberalization of trade, has been completed and currently, the aim is for the WB countries to move towards the creation of a Common Regional Market (CRM). This regional cooperation is expected to help these countries towards European integration as these countries show similar economic and political characteristics. Specifically, the economies of the Western Balkan countries are characterized by a modest economic power compared to other European countries. Thus, the GDP for all 6 Balkan countries is about 104.5 billion USD, or otherwise 0.7% of the value of the GDP of the European Union (14.600 billion USD/2022). According to the countries, Serbia is the country with the largest economic weight (about 46%), followed by Bosnia and Herzegovina (18%), Albania (13%), North Macedonia (10%) and then Kosovo* (7%). and Montenegro (4%).

* Under the UN Resolution 1244.



* Kosovo - Under the UN Resolution 1244.

Figure 1. Economic power of the countries of the Western Balkans - GDP 2021

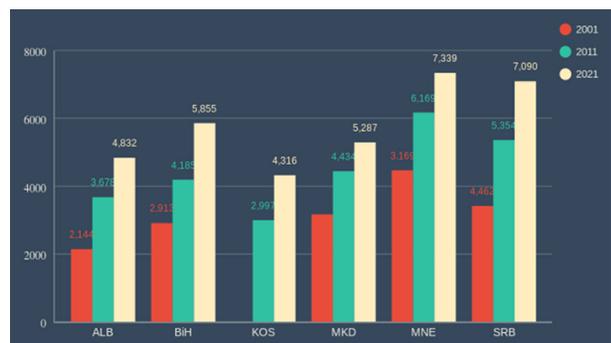


Figure 2. GDP per capita, 2001-2021 (USD 2015)

Source: World Bank, 2022

Likewise, other economic indicators demonstrate the economic similarities of WB countries, supporting the basis for regional cooperation. GDP per capita, as illustrated in the figure, in these countries is approximately 4 - 7 thousand USD per capita, compared to about 33 thousand USD per capita for EU countries. On average, for the entire region taken together, GDP per capita is around 5,900 USD, or approximately 5.5 times lower than that of the EU countries, (32,755 USD).

Regarding the economic structure, services are the sector with the highest added value in GDP in all the countries of the region 47-60%, staying in the same line with the EU but still with a deep differentiation since the average of the European countries is around 65%, only Montenegro is close, where tourism has a significant place. Concerning industry, except for Montenegro, it can be seen that this sector occupies a similar weight in all countries (22-25%) and at the same time approximately similar to that of the EU countries (23%). For Albania, in the comparison between countries, the high weight of agriculture, forests and fishing is characteristic (17.7%), compared to the 5-7% that this sector occupies in other countries; meanwhile, in the EU countries, it is only 1.6%. The weight of this sector is related to the rural population.

Table 1. Sectorial Structure of WB countries

	ALB	BiH	KOS	MNE	MKD	SRB	EU
Industry (including construction), value added (% of GDP)	21.8	24.6	26.6	15.0	21.5	25.3	23.0
Agriculture, forestry, and fishing, value added (% of GDP)	17.7	5.7	7.0	6.3	7.6	6.5	1.6
Services, value added (% of GDP)	47.7	56.0	46.4	59.7	55.9	51.5	64.7
Manufacturing, value added (% of GDP)	6.2	13.8	13.4	4.1	12.6	13.3	14.9
Taxes minus production subsidies, value added (% of GDP)	12.8	13.7	20.0	19.0	15.0	16.7	10.6

* Kosovo - Under the UN Resolution 1244.

Source: Vienna Institute for International Economic Studies – WIIW, 2022

From the data, it can be seen that the main trade partner of the countries of the Western Balkans is the European Union, the percentage of exports to these countries varies from 80% to 31% of exports. Especially Albania (79.8%), North Macedonia (77.3%) and Bosnia & Herzegovina (72.8%) have closer relations.

Table 2. Structure of exports of Western Balkan countries according to partners (2021)

	Albania	Bosnia and Herzegovina	Kosovo*	Montenegro	North Macedonia	Serbia
<i>EU - 27 countries</i>	79.8%	72.8%	31.4%	31.1%	77.3%	64.5%
Albania		0.4%	14.7%	4.6%	1.4%	0.9%
Bosnia and Herzegovina	0.7%		1.5%	7.6%	1.4%	7.2%
Kosovo*	10.2%			5.4%	4.4%	
Montenegro	1.6%	2.8%	3.3%		0.5%	3.8%
North Macedonia	3.4%	0.9%	11.6%	1.1%		3.8%
Serbia	2.7%	12.1%	5.9%	24.5%	4.2%	
<i>WB6</i>	18.6%	16.2%	37.0%	43.2%	11.9%	15.7%
Greece	5.8%	0.1%	0.6%	2.6%	3.0%	1.1%
Germany	5.5%	15.0%	8.2%	4.6%	46.7%	12.7%
Italy	42.2%	11.3%	8.0%	5.8%	3.0%	8.5%
United States	1.3%	1.1%	16.4%	0.7%	1.0%	2.0%
France	1.1%	2.3%	1.4%	0.5%	1.0%	2.8%
Croatia	0.9%	13.1%	0.8%	0.8%	1.4%	3.1%
United Kingdom	0.3%	0.6%	1.0%	0.3%	2.6%	1.7%
Russia		0.8%		0.5%	0.5%	3.9%
<i>Other</i>	0.0%	8.5%	14.2%	24.2%	6.7%	12.2%
<i>Total</i>	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Total Value (Euro m)	3,011.32	7,297.94	749.7	437	6,922.60	21,623.19
in % of GDP	19.51%	36.94%	9.42%	8.82%	58.99%	40.56%

* Kosovo – Under the UN Resolution 1244.

Source: Vienna Institute for International Economic Studies – WIIW, 2022

In imports, it can be seen that the main trade partner of the countries of the Western Balkans is the European Union, where the weight for all countries fluctuates between 44% and 59%. However, except for Kosovo* and Montenegro, this weight is lower than that of exports (table 5), which means that these countries relatively export less than they import to the European Union.

Table 3. Structure of imports of Western Balkan countries according to partners (2021)

	Albania	Bosnia and Herzegovina	Kosovo*	Montenegro	North Macedonia	Serbia
<i>EU - 27 countries</i>	58.0%	58.9%	44.3%	45.7%	46.2%	57.1%
Albania		0.3%	5.7%	1.7%	1.0%	0.2%
Bosnia and Herzegovina	0.6%		1.1%	5.1%	0.7%	2.7%
Kosovo*	1.9%			0.3%	0.8%	
Montenegro	0.6%	0.3%	0.5%		0.1%	0.3%
North Macedonia	1.7%	0.9%	5.2%	1.3%		1.1%
Serbia	3.5%	11.2%	6.5%	20.0%	6.8%	
<i>WB6</i>	8.3%	12.6%	19.1%	28.5%	9.4%	4.3%
Greece	8.0%	0.8%	4.4%	5.9%	7.6%	1.4%
Germany	6.9%	11.9%	13.0%	6.2%	10.2%	13.2%
Italy	24.3%	12.0%	5.9%	1.2%	4.3%	8.1%
United States	1.8%	2.5%	2.0%	1.2%	2.0%	1.4%
France	1.6%	2.0%	1.4%	1.9%	1.3%	2.6%
Croatia	1.0%	8.9%	2.0%	5.5%	1.0%	2.3%
United Kingdom	0.8%	0.6%	0.7%	0.9%	17.7%	0.9%
Russia	1.9%	2.9%	1.1%	0.4%	1.6%	5.3%
<i>Other</i>	31.0%	24.9%	36.60%	25.80%	44.40%	38.60%
<i>Total</i>	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Total Value (Euro m)	6,538.60	11,042.30	4,652.80	2,505.10	9,638.30	28,602.80
in % of GDP	42.4%	55.9%	58.5%	50.6%	82.1%	53.6%

* Kosovo – Under the UN Resolution 1244.

Source: Vienna Institute for International Economic Studies – WIIW, 2022

* Under the UN Resolution 1244

If we look at the ranking of the countries of the Western Balkans according to the global competitiveness index (GCI), which determines the level of productivity of a country compared to the global climate, in the last five years of its calculation, it is found that Serbia is in the best position, being ranked in 2019 as the 72nd country (out of 141 countries analyzed), while Bosnia and Herzegovina is less competitive, being ranked as the 92nd country. Albania is in an average position in terms of competitiveness compared to other countries in the region. In 2019, it was ranked as the 81st country, while there was an improvement in the position, surpassing in the ranking of about 10 countries from 2015.

Table 4. GCI Ranking in WB countries, 2015-2019

Ranking by GCI	2015 out of 140 countries	2016 out of 138 countries	2017 out of 135 countries	2018 out of 140 countries	2019 out of 141 countries
Albania	93	80	80	76	81
Bosnia and Herzegovina	111	107	90	91	92
Montenegro	79	82	73	71	73
North Macedonia	60	68	NA	84	82
Serbia	94	90	70	65	72

Source: World Economic Forum, 2023

North Macedonia has been ranked better than other countries in the first two years, with a significant difference in ranking, as the 64th country in 2015, while the next closest country was Montenegro ranked 79th, but after this year it has suffered a deterioration on its competitive position, falling more than 10 places in weight for 2019, while Montenegro, on the other hand, has maintained the second place as the highest ranked in the region. While referring to the value of the GCI index, the countries are presented in this situation as follows:

Table 5. GCI scoring for WB, 2007-2016 and 2017-2019

GCI Index	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Albania	3.55	3.48	3.55	3.72	3.94	4.06	3.9	3.84	3.93	4.06	57.3	58.1	57.6
Bosnia and Herzegovina	3.82	3.55	3.55	3.52	3.7	3.82	3.93	4.01	3.71	3.8	53.8	54.16	54.7
Kosovo*	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Montenegro		3.9	4.11	4.15	4.36	4.27	4.14	4.2	4.2	4.05	58.2	59.62	60.8
North Macedonia	3.81	3.73	3.87	3.94	4.01	4.05	4.04	4.13	4.28	4.23	Na	56.62	57.3
Serbia		3.78	3.9	3.76	3.83	3.87	3.87	3.77	3.89	3.97	59.2	60.88	60.9

* Kosovo - Under the UN Resolution 1244.

Source: Trading Economics, 2023

Albania was in a relatively weaker competitive position than other countries before 2010, specifically in the last years 2007-2009 with an almost unchanged index calculated by around 3.5 points, while from 2010 to 2016 the index improved with its highest value of 4.06 in 2012 and 2016. The countries with a better performance, referring to the GCI value, are Montenegro and North Macedonia, which resulted in an average GCI value of 4.15 and 4.01. Serbia appears with a more stable position, not marking many changes in competitive positions with an average index of 3.8. Meanwhile, data on competitiveness are not reported for Kosovo*. This performance continued for 2017-2019.

In accordance with the economic theory on the stages of development, according to the GCI index in *the first stage the economy is factor driven* and countries compete based on the possession of factors such as unskilled labor and natural resources. Maintaining competitiveness

* Under the UN Resolution 1244.

at this stage of development depends mainly on the well-functioning public and private institutions, a well-developed infrastructure, a stable macroeconomic environment, and a healthy workforce that has at least a basic education. As a country becomes more competitive, productivity and wages will rise. Countries will then move into *the efficiency-driven stage of development*, beginning to develop more efficient production processes and increasing product quality because wages have risen and cannot raise prices. At this point, competitiveness is increasingly driven by higher education and training, efficient goods markets, well-functioning labor markets, developed financial markets, the ability to take advantage of existing technologies, and a larger market either domestic or foreign. Finally, as countries move toward the innovation stage, wages will have risen enough to be able to sustain higher wages and living standards only if their businesses are able to compete using more efficient production processes sophisticated and innovative new processes. Considering GDP per capita, Albania (\$4,832 in 2021) and the countries of the WB region (\$4,316-7,339) are in the second stage of development, driven by efficiency. For the calculation of the GCI for each country, 12 pillars have been evaluated, which are also calculated and weighted for each country.

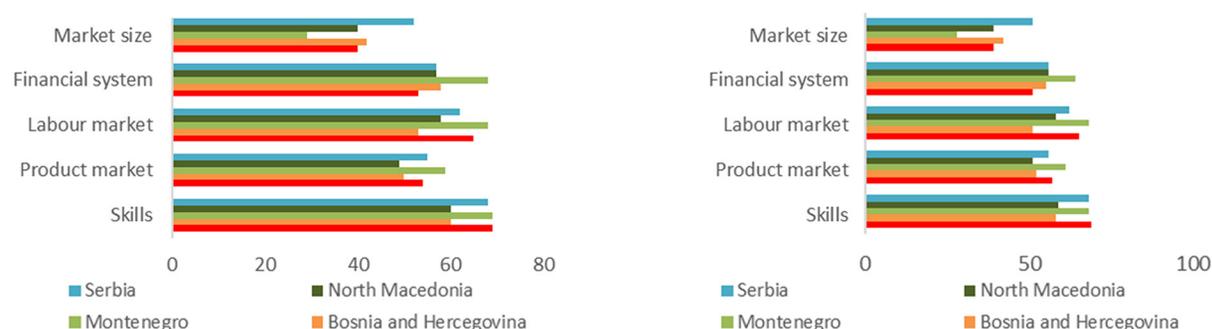


Figure 3. Sub-pillars oriented toward efficiency, 2019 vs 2018

Source: World Economic Forum, 2023

Estimates for sub-indexes that measure the country's efficiency-driven capacity: show that the weakest country in the region is Bosnia Herzegovina with 51.6-52.6 points in the 2018-2019 period. Albania is in an average position compared to other countries, with an average for these sub-indexes of 56.2, which appears unchanged for two years. Montenegro and Serbia lead in this category of indicators with an average of around 58-59, which also improved in 2019, as illustrated in the graphs above for each sub-index representing the category of efficiency-driven indicators.

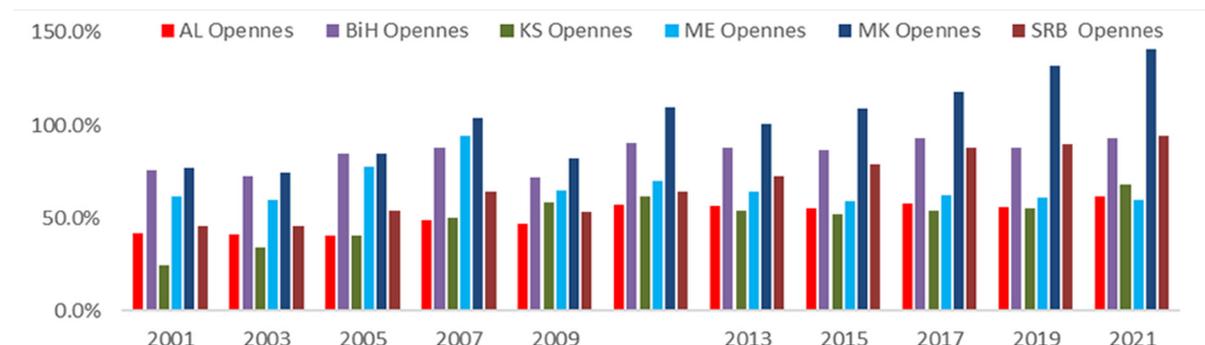
Another indicator of the competitiveness and innovation of countries that allow their comparison is the Global Innovation Index (GII). This index ranks world economies according to their innovation capabilities. Consisting of approximately 80 indicators, grouped into innovation inputs and outputs, the GII aims to capture the multidimensional aspects of innovation. This indicator positions Serbia, Montenegro and Macedonia better for 2022, being part of the second quartile with the best ranking, namely Serbia in 55th place, Montenegro in 60th and Macedonia 66th. Albania is the last country in the region in terms of innovation measured according to this index, ranked 84th out of 132 countries, which is the last of the European countries that have been analyzed.

In terms of the sub-pillars of innovation, Albania scores better for Infrastructure and business sophistication. However, Albania performs worse than the average of the region in all pillars of the innovation index. An indicator that has a positive effect on the level of innovation and competitiveness as a whole, in these countries and trade openness, which appears in this situation for the countries BP.

Table 6. GII Ranking 2022 (overall and by innovation pillar)

Global Innovation Index	Albania	Serbia	BiH	Montenegro	North Macedonia
Overall GII	84	55	70	60	66
Institutions	84	53	94	59	88
Human capital and research	89	52	67	61	75
Infrastructure	57	38	55	44	49
Market sophistication	91	83	25	53	34
Business sophistication	56	65	98	58	59
Knowledge and technology output	96	42	63	72	57
Creative outputs	82	76	83	71	93

Source: WIPO, 2023



* Kosovo - Under the UN Resolution 1244.

Figure 4. Trade openness/GDP

Source: Vienna Institute for International Economic Studies – WIIW, 2023

As reflected in the data for the last two decades, the country with the highest trade openness is North Macedonia, which in the last decade has exceeded the level of openness by more than 100%. It is followed by countries such as Serbia and Bosnia and Herzegovina, which result in a level of trade openness of more than 90% of the respective GDPs. Meanwhile, Albania, Kosovo* and Montenegro are in similar positions with trade openness of around 60 -70%. This indicator, as accepted by many authors, shows a strong positive correlation with the level of innovation, which is also supported by the results of the GII, confirming the low level of innovation in countries like Albania, which also has trade openness at lower levels. than other BP countries.

4. CONCLUSION AND RECOMMENDATIONS

Regional cooperation is seen as an important process to help the integration of Western Balkans countries towards the European Union. Regional integration by promoting competitiveness among countries is thought to increase convergence towards the EU. But competitiveness itself is a complex concept that requires work in many dimensions. There's an existing gap amongst Western Balkan Countries according to economic regional cooperation. Policymakers should implement effective instruments to promote the regional common market. Exist the weak convergence of competitiveness and economic efficiency amongst Western Balkan countries.

The countries of the Western Balkans are in the market integration phase. The first step, which is the liberalization of trade, has been completed and currently, the aim is for the WB countries to move towards the creation of a Common Regional Market (CRM).

* Under the UN Resolution 1244.

The economies of the Western Balkan countries are characterized by a modest economic power compared to other European countries. The economic similarities of WB countries, support the basis for regional cooperation. The main trade partner of the countries of the Western Balkans, in terms of exports and imports, is the European Union. Among other economic factors, several authors have estimated that trade openness has had a positive and statistically significant effect on national competitiveness and innovation in the above countries. Considering GDP per capita, referring to the competitiveness level, Albania and the countries of the WB region are in the second stage of development, driven by efficiency. Albania performs worse than the average of the WB region in all pillars of the innovation index. It is ranked the last country for the global index innovation among the European countries that have been analyzed. Albania is in an average position in terms of competitiveness compared to other countries in the region.

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Comparison of the Economic Activity Rate of Population in the Slovak Republic and the Czech Republic

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Abstract: *The rate of economic activity of the population is one of the indicators of the state of the labour force. Indicator values are also dependent on the demographic development of the population in productive age. The paper aims to compare the development of the rate of economic activity of the population in the Slovak Republic and the Czech Republic within the period 2000–2020. The research sample was created from the databases of the Statistical Office of the Slovak Republic and the Czech Statistical Office and evaluated using the methods of descriptive statistics and regression analysis. Results proved that the economic activity rate of the population is threatened in the long term in both countries. In the period 2000–2020, the economic activity rate in Slovakia decreased by 1.3%. The analysis of the development of this indicator in the Czech Republic (period 2000–2020) showed that the economic activity rate increased by 4.82%.*

1. INTRODUCTION

The analysis of economic activity and unemployment of the population is part of the demographic, social and economic research of the population. Economic activity is one of the important characteristics of the population, which is divided into economically active (i.e. employed and unemployed) and economically inactive (Hudečková, 2005). Unemployment as a socio-economic phenomenon is strongly associated with the labour market. It is a consequence and at the same time a manifestation of the imbalance in the labour market, between the supply and demand for work.

In the research study, Bucci (2023) analyses the conditions for sustainable economic growth, which is also supported by investments in research and development and human capital. The results show that, under certain conditions, a negative rate of population growth can simultaneously have a positive effect on human capital investments calculated per inhabitant.

Human resources are an important factor of economic development in terms of qualitative and quantitative characteristics, as well as in terms of migration during the productive age. The inhabitants represent the socio-demographic and cultural potential of the country/region, they represent producers as well as consumers in relation to economic development (Papcunová & Gecíková, 2012).

In terms of unemployment, there are regional differences in Slovakia. Regions with a high unemployment rate are located in eastern, southern, and central Slovakia. On the contrary, the regions in western Slovakia, especially the Bratislava districts, have the lowest unemployment (Hornýák Gregáňová & Pietriková, 2017). Regions with the highest unemployment due to the previous mono-industrial structure have a workforce with a specific profile of education and qualifications and with a difficult possibility of adapting to the current demands of the labour market (Martincová, 2002).

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The evaluation of further economic development is important to follow in the context of the development in the group of pre-productive, productive, and post-productive populations. The development of the population of Slovakia in the post-productive age follows the trend in most European countries, the consequence of which is a significant aging of the population. From the point of view of the prediction of the development of the rate of economic activity of the population, a decrease is expected due to the lack of labour force. Part of the population at retirement age will continue to be active in the labour market (Országhová, 2017). The authors of the research study (O'Reilly et al., 2015) analysed important factors of youth unemployment that are associated with the labour market flexibility, wide possibilities of higher education, global conditions for youth migration, and the long-term unemployment connected with the risk of poverty and social exclusion of families.

2. MATERIAL AND METHODS

The main goal of the contribution was to evaluate the development of the rate of economic activity of the inhabitants of the Slovak Republic and the Czech Republic in the period 2000–2020. The basic indicators of the labour market are the rate of economic activity, rate of economic inactivity, rate of employment and rate of unemployment. The mentioned indicators are monitored and evaluated at the national and regional levels. The development of unemployment is influenced not only by economic factors, which act mainly through the growth of employment but also by demographic, social and other factors affecting the balance of labour forces. The rate of economic activity of the population is a quantitative indicator of the state of the labour force, which expresses the percentage of persons belonging to the labour force to the total number of persons aged 15 and over.

The category of economically active population includes all persons aged 15 and over who meet the requirements for classification between employed and unemployed. The category of economically inactive residents includes pensioners, students, children under the age of 14 and others. The interest of each state is achieving the lowest possible unemployment rate using political and economic instruments. The registered unemployment rate does not accurately reflect the actual level of unemployment, as it only captures the state of registered unemployed at the employment offices. Many people do not work for various reasons, but they are not kept in any state records. In the article, there were used scientific and cognitive methods, i.e. problem analysis, method of comparison, synthesis of obtained information, deduction and estimation using the trend function.

3. RESULTS

3.1. Comparison of Labour Market Indicators in the Slovak Republic and the Czech Republic

The following section presents the results of the Economic activity rate (EAR) analysis in the Slovak Republic (SR) and the Czech Republic (CR). In both countries between 2010 and 2020, the Economic activity rate (EAR) has a variable development (Figure 1). In the Czech Republic, EAR values range from 69.64% (in 2008) to 76.83% (in 2019). In the Czech Republic, from 2008 to 2019, the value of the indicator had an increasing trend, which changed in 2020 under the influence of the coronavirus pandemic. In the Slovak Republic, the development of the indicator fluctuated more, with values ranging from 58.8% (in 2007, 2011) to 60.7% (in 2001). The graph shows that from 2017 to 2020 the EAR indicator has a decreasing trend in the Slovak

Republic. In the long term, the EAR in the Slovak Republic decreased from 60.3% (year 2000) to 59% (year 2020). The opposite phenomenon occurred in CR, where in the long term the EAR increased from a value of 71.53% (year 2000) to a value of 76.35% (year 2020).

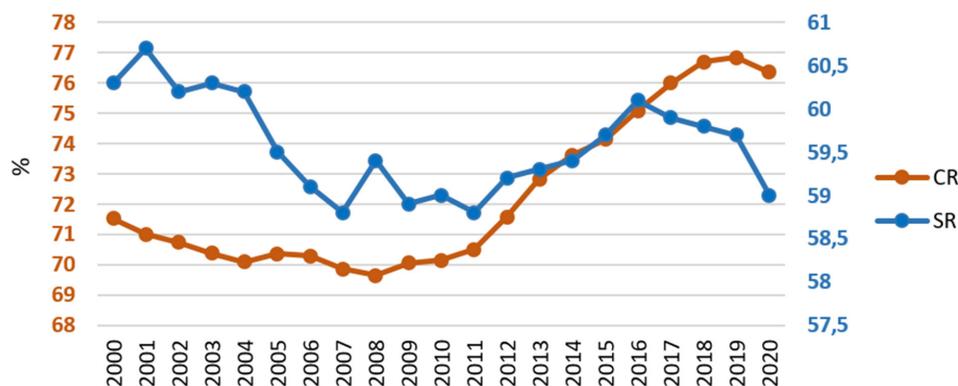


Figure 1. Economic activity rate in SR and CR (age 15–64)

Source: Czech Statistical Office (2023), DataCube (2023), own processing

Another analysed indicator is the unemployment rate in the category of residents of productive age (15-64). The development of unemployment in the SR and CR shows a similar trend in the period 2000-2020 (Figure 2). From 2000, unemployment gradually decreased until 2008, when the impact of the global economic crisis was felt in the labour market. Subsequently, a slight increase in unemployment until 2013, followed by a decrease in unemployment until 2020, when restrictions imposed during the coronavirus pandemic affected the labour market. After the end of the pandemic, there was a labour shortage in some industries that were most affected by the limitation of direct human contact.

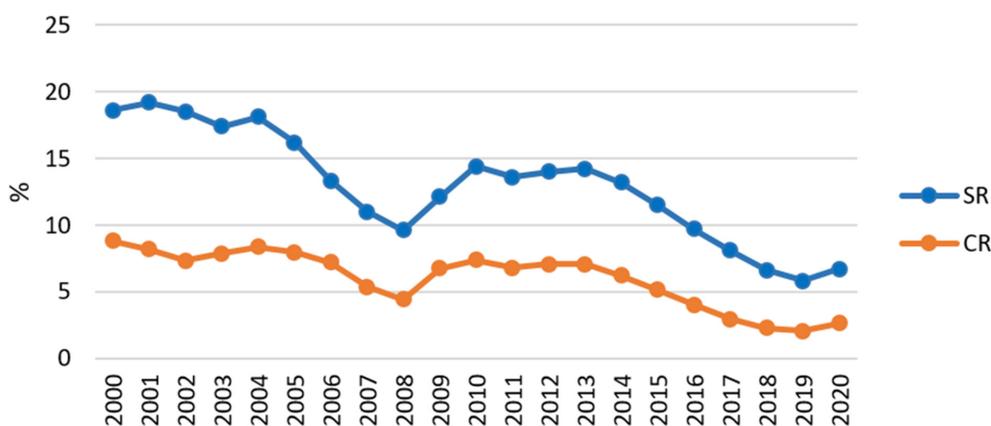


Figure 2. Comparison of unemployment rate in SR and CR (age 15–64)

Source: Czech Statistical Office (2023), DataCube (2023), own processing

Figure 3 shows the development of the employment rate in the Czech and Slovak Republics. In 2009 and 2010, there was a decrease in employment due to the economic crisis. In the long term, the development of employment in both states is slightly increasing. Estimated linear trends are increasing as follows:

$$\text{Trend line for CR: } y = 0.5383x + 62.065; R^2 = 0.7678 \quad (1)$$

$$\text{Trend line for SR: } y = 0.5656x + 54.75; R^2 = 0.8218 \quad (2)$$

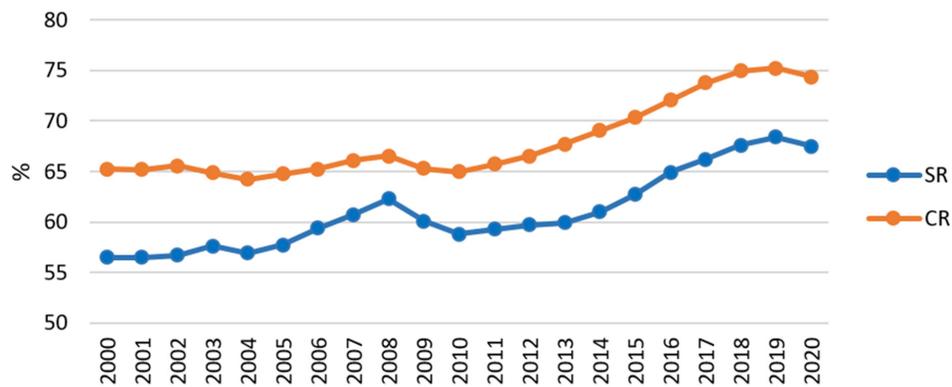


Figure 3. Comparison of employment rate in SR and CR (age 15–64)

Source: Czech Statistical Office (2023), DataCube (2023), own processing

In the context of the aging of the population, the development of the rate of economic activity of the population is threatened in the long term in both countries. Because of insufficient renewal of the working generation, a part of the population of retirement age remains active on the labour market despite their older age. Eurostat’s demographic estimates are associated with a significant decrease in the number of productive age persons from 15 to 64 years (Dubravská, 2017).

3.2. Development of Selected Labour Market Indicators in the Czech Republic

Figure 4 shows the development of the economic activity rate in the Czech Republic according to the group of males and females. Women’s EAR is lower compared to men’s economic activity, which naturally results from the role of women in the family.

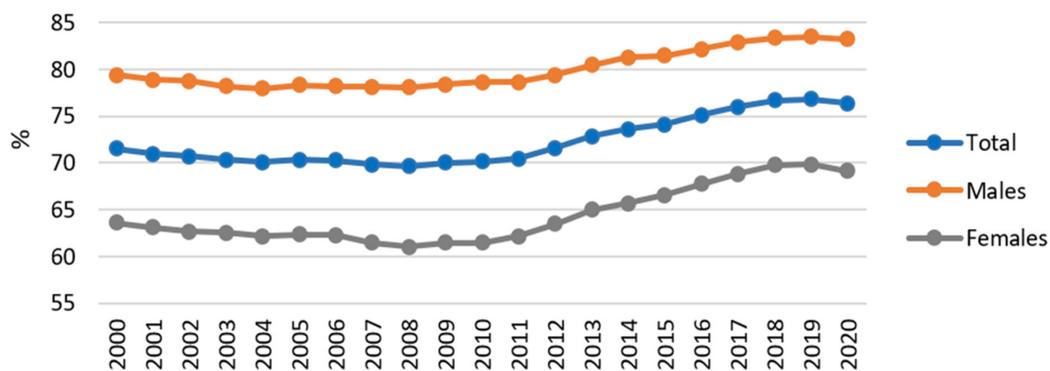


Figure 4. Development of economic activity rate in the Czech Republic (age 15–64)

Source: Czech Statistical Office (2023), own processing

Men are traditionally considered the main breadwinners who provide the family with the necessary financial resources. Nevertheless, the development of the EAR for males and females exactly copies the overall growing development of the indicator in the period 2000-2020.

The development of unemployment in the Czech Republic by gender showed that men have a lower unemployment rate than women in the long term (Figure 5).

The change in the educational structure of the population also affects the development of the size of the economically active population (Šimková & Petkovová, 2011; Langhamrová et al., 2009). The number of people with lower education is decreasing and the number of people with

higher education is increasing. The authors further state that increasing the number of persons with a higher level of education has two positive effects. People with higher education have a higher rate of economic activity, especially in older age. This group of people usually also has higher incomes, which means the possibility of higher tax and insurance contributions, which is expected to reduce the economic burden on the pension system.

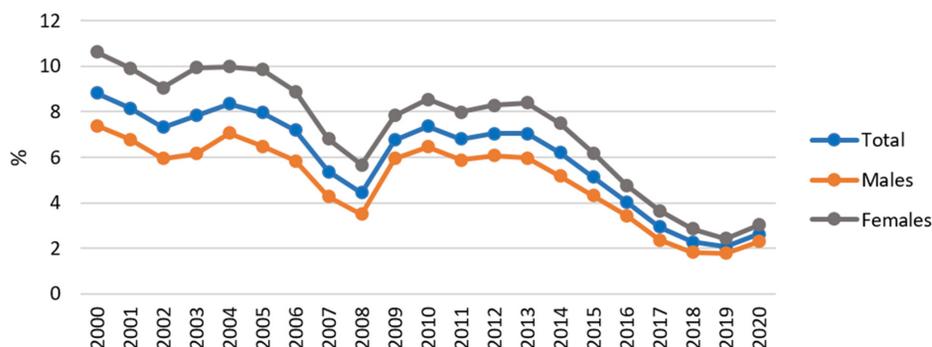


Figure 5. Development of the unemployment rate in the Czech Republic (age 15–64)

Source: Czech Statistical Office (2023), own processing

3.3. Participation of Seniors in the Labour Market in the Slovak Republic

Population aging is one of the biggest challenges in the coming period. Figure 6 shows the development of EAR in Slovakia in the period 2011–2021 in the age category 60–70 years. Some employees are already retired, but they are still active in the labour market. It can be seen that in 2012 the indicator increased the value for the group of males; in the group of females, the indicator decreased compared to 2011. In the following period until 2021, the development of ERA shows an increasing trend, while the reasons are mainly economic (e.g. low pensions, increase in the retirement age, etc.).

According to Eurostat's demographic estimates, between 2010 and 2050, the number of EU residents over the age of 65 should grow from the current 87 million to 148 million (that's by 70%). At the same time, forecasts estimate a 12% decrease in the number of people of working age from 15 to 64, i.e. from the current 335 million to 294 million in 2050. An important indicator is the ratio of the number of people over the age of 65 to the number of people of working age from 15 to 64 years old, which should double from 26% to almost 50% in the mentioned period. Forecasts for individual states of the European Union show differences. Eurostat estimates the most significant increase in the number of people over the age of 65 in Slovakia (Dubravská, 2017; Türk, 2011).

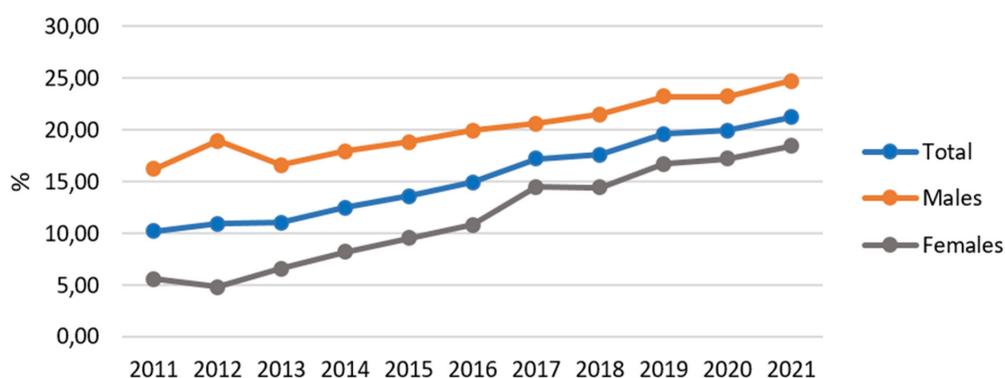


Figure 6. Development of economic activity rate in Slovakia (age 60–74)

Source: DataCube (2023), own processing

4. FUTURE RESEARCH DIRECTIONS

Population aging is one of the indicators of sustainable development and is directly related to demographic development. In the Slovak Republic, the average life expectancy is slowly but steadily increasing. Another important factor for the rate of economic activity of the population is the demand for a qualified labour force, which has come to the fore in the Slovak labour market. The job offer contains professions for which workers with the required qualifications are not applying. Another indicator in the researched area is the possibility of working part-time, which would also be used by parents with minor children because taking care of children does not allow them to work full-time. The interest of employees in working from home is also increasing, which began to be applied in Slovakia, especially during the coronavirus crisis in 2020.

5. CONCLUSION

A comparison of selected economic indicators of the labour market in SR and CR did not show significant differences. The labour market and its related indicators – economic activity rate, employment rate and unemployment rate – in the analysed period of 2000-2020 showed a similar development in both countries. From a long-term perspective, the economic activity rate in Slovakia decreased slightly (by 1.3%); on the other hand, in the Czech Republic, the economic activity rate increased (by 4.82%).

Employers can carry out many positive things to maintain the necessary level of economic activity and employment. This includes the exclusion of discrimination in the workplace due to older age, the offer of flexible types of work for mothers with children, suitably modified work positions for older workers, reduced working hours, etc. From the point of view of further development, it is also important to monitor changes in the group of residents in the pre-productive age up to 15 years who represent the potential workforce.

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The Dynamics of Albanian Insurance Market and Its Importance in Economic Development

Klaudia Lipi¹ 

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Regulatory constraints;
Market dynamics;
Socio-economic factors



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Abstract: *The insurance market plays a crucial role in promoting economic stability and mitigating risk within any economy. The primary objective of this research is to provide a complete understanding of the dynamics of the insurance sector in Albania, analyzing the main factors that influence its growth and development. The study uses a mixed methods approach, combining quantitative data analysis with qualitative insights drawn from expert interviews, policy documents and industry reports. Identifying the challenges, especially after the Covid-19 pandemic is a critical aspect of this study. The research identifies and assesses barriers to market potential, including limited public awareness of insurance, regulatory constraints and the impact of socio-economic factors on consumer behaviour. These challenges are contrasted with opportunities such as the untapped potential of digitization and advances in technology, which could reshape the industry's trajectory. Also, the findings of this research can serve as a valuable resource for policymakers, industry actors and researchers interested in understanding and contributing to the growth and development of the insurance sector in Albania. Additionally, the analysis contributes to the broader discourse on insurance market dynamics in emerging economies, shedding light on the unique challenges and opportunities such markets face.*

1. INTRODUCTION

The insurance market is an integral component of any economy, serving as a critical mechanism for managing risks, promoting financial stability, and providing individuals and businesses with the means to mitigate potential losses. Albania, a country located on the Balkan Peninsula with a unique blend of historical and cultural influences, is no exception to the importance of a well-functioning insurance sector.

The Albanian insurance market has experienced significant transformations over the years, reflecting the wider changes in the country's economic and social landscape. Emerging from a period of political and economic transition, Albania has made strides towards fostering a stable and open market economy. The insurance sector, as part of the larger financial ecosystem, has played an essential role in this evolution. As a country with a growing economy and developing financial markets, the insurance sector in Albania plays a key role in risk management, preserving assets and contributing to overall economic resilience.

Albania's journey towards creating a modern insurance market has not been without obstacles. Historical factors, including the legacy of a state-controlled economy, have influenced the trajectory of the sector. In addition, the challenges of increasing public awareness of the benefits of insurance, fostering confidence and creating a robust regulatory environment have presented unique barriers to industry growth.

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On the other hand, the Albanian insurance market is developing and quite promising. As the country further integrates with global markets and embraces digitization, new avenues for innovation and market expansion are emerging. The potential to reach previously underserved segments of the population and adapt to changing consumer preferences presents a compelling prospect for insurers and policymakers.

1.1. Purpose of the Research

This paper aims to carry out an analysis of the insurance market in Albania, the dynamics of this market, also affected by the Covid-19 pandemic period, a description of the current state of this market, the role of this market in the economy, the challenges and advantages that affect the operation in a fair way of this market. Understanding the dynamics of the insurance industry is important for policymakers, industry stakeholders and researchers too.

1.2. Objectives of the Study

- Determination of the state of the insurance market in Albania.
- Analysis of the challenges and opportunities that this market has in Albania.
- Data analysis, to come to complete conclusions regarding the state of the insurance market in Albania, how aware the population is about the functioning of insurance and how much do they prefer to be insured.
- Also to give insurance companies recommendations on what policies they should adopt for the well-functioning of this market and better financial education of people.

2. METHODOLOGY

The methodology used to achieve the goal and fulfil the objectives is the literature review and the analysis of the quantitative data collected. For this reason, primary data from questionnaires and secondary data from official sources are used.

The first part of the study gives a complete description based on the search of literary sources and scientific databases. These secondary sources are focused on the characteristics of the issues, the forms, the apparent divisions, and the identification of the circumstances in this market. In order to achieve and concretize the objectives, it was necessary to carry out a primary survey with questionnaire answers. It was composed of 10 questions. These questions are determined based on the objectives and formulated for the purpose of the study. Each question has an important element for which it is used as an input in the process of deriving results.

2.1. Sampling Method

It uses simple random sampling, referring to 500 people, in South-East Albania, to collect information on the insurance market and to get to know the dynamics of this market from the individual perspective.

2.2. Data Collection Method

Data were retrieved from the literature and also using primary survey research to conduct their thorough analyses. For the primary research, the data obtained from the questionnaires were transcribed and processed using the SPSS Statistics program.

3. LITERATURE REVIEW

The literature related to the insurance market in Albania provides valuable insights into the historical development, current challenges, opportunities and legal considerations that shape this critical sector of the economy. As Albania continues to transition from a controlled economy to a more market-oriented system, understanding the dynamics of the insurance industry is important for policymakers, industry stakeholders, and researchers.

The historical context of the insurance market in Albania is marked by the transformation from a centrally planned economy to a more open commercial system. The period after the fall of communism in the early 1990s saw a shift from state-owned enterprises to private insurance companies. This transition brought challenges related to adapting to market principles, building consumer confidence and creating a competitive landscape. Researchers have analyzed the structure of the insurance market in Albania, often divided into life and non-life insurance segments. It is worth underlining the dominance of non-life insurance products, where car insurance is an important contributor. Researchers have analyzed factors that influence market penetration rates, such as income levels, consumer awareness, and cultural perceptions regarding risk management.

A central theme in the literature is the identification of the challenges facing the insurance market in Albania. Limited public awareness and understanding of insurance, along with the historical lack of an insurance culture, have been documented as major barriers to market growth. Economic factors and differences in income affect the possibility and accessibility of insurance products for different segments of the population. Insurtech innovations, mobile banking and online sales channels are seen as potential avenues for expanding market reach and improving customer engagement.

The legal environment that oversees the insurance market in Albania has attracted the attention of researchers. Researchers have evaluated the legal and supervisory framework, examining its compliance with international standards and effectiveness in ensuring market stability and consumer protection. The role of the Albanian Financial Supervisory Authority (AFSA) in supervising insurance activities and shaping legal policies should be evaluated.

This study serves as a basis for further analysis and exploration in this study, contributing to the broader discourse on the dynamics of the insurance market in developing economies.

3.1. The Role of the Insurance Market in Society and Economy

The insurance market is an integral part of the economic and financial system, playing an important role in managing risks and providing financial protection to individuals, companies and institutions. In the literature of economics and finance, this market has been the subject of many studies and in-depth analyses, where experts have examined its structural changes, economic impact, challenges and implications of the insurance market.

The role of insurance in risk management has been essential for the development of this market. As (Black, 2000) points out, “Insurance is the only financial tool that individuals and companies have to manage and transfer unexpected risks”. By transferring these risks to insurance companies, customers feel protected from the financial consequences of unexpected events such as damage, theft and natural disasters.

Insurance market efficiency and information asymmetry issues are deep topics in the economic literature. Information asymmetry, as (Akerlof, 1970, pp. 488-500) defined, “describes the situation where one party knows more than the other in a transaction”. This can lead to difficulties in determining insurance premiums and situations where customers get more insurance than they deserve. In this context, the authors Rothschild and Stiglitz (1976, pp. 488-500) have argued that if insurance companies do not always know the full risk history of customers, they may incur higher risk management costs.

The insurance market is a part of the economic and financial system, which plays an important role in managing risks and providing financial protection for individuals, companies and institutions. The insurance market has a significant impact on the global economy. According to Hoyt (1990, pp. 304-315), “Insurance helps economic growth by improving the allocation of capital and better distribution of risks”. This aspect is closely related to the opportunity that insurance offers to reduce enterprise risks and encourage new investments and innovations in the market.

However, financial crises and natural disasters can have major impacts on the operation of the insurance market, events of a nature that are difficult to manage by insurance companies. As Hartwig (2005, pp. 359-394) points out, “adverse events, for example, events of a pandemic nature, are difficult for insurance companies to manage”. This can present challenges in determining appropriate premiums and responding to large risks.

In Albania, a significant part of the income is provided by the insurance market, contributing to the economic development process of our country. They serve as an engine for the sustainable development of the markets connected to them.

To protect financial stability and address these challenges, the insurance market needs strict and appropriate regulation. Through regulators and government accountability institutions, such as AFSA (Albanian Financial Supervisory Authority), insurance can help reduce systemic risks and the potential impact of adverse events on the overall economy.

In conclusion, the literature on the insurance market is mainly focused on structural changes, economic impact, challenges and its implications in society and economy. Through in-depth research and extensive analysis, this literature helps to understand the important role of the insurance market in managing risks and providing financial protection in a volatile economic environment.

3.2. Presentation of the Albanian Insurance Market

The insurance market is a sector of the financial industry that offers financial protection services against various risks. Insurance covers potential damages that may occur in the future and allows individuals, companies and organisations to feel more secure about the possible costs of damages. For several years now the insurance market has served as a sustainable support for social development and financial contribution to the general economic development of the country through the reduction of risks.

The insurance market is an important sector of the financial industry that provides various services to individuals, companies and institutions to manage and transfer financial risks. This market is made up of different insurance companies that offer different insurance products, such as life insurance, property insurance, health insurance, car insurance, and many more.

The main role of the insurance market is to provide protection and financial compensation to customers in case of unexpected events and damages. In this way, insurance helps to reduce financial risks and the negative impact that these events can bring. Individuals and companies purchase insurance to provide a sense of financial security and to have an opportunity to withstand various losses and damages without catastrophic consequences for their finances.

Some important data about insurance market dynamics during the last three years, extracted from the Albanian Financial Supervisory Authority (AFSA):

- Insurance Market in Albania for the period January–November 2021
Gross Written Insurance Premiums income during the period January–November 2021 amounted to over 17,370 million, or 17.59% more compared to January–November 2020. In the period January–November 2021, the number of concluded insurance contracts reached 1,055,799 registering an increase of 23.12% compared to January–November 2020. (Albanian Financial Supervisory Authority, AFSA, 2021)

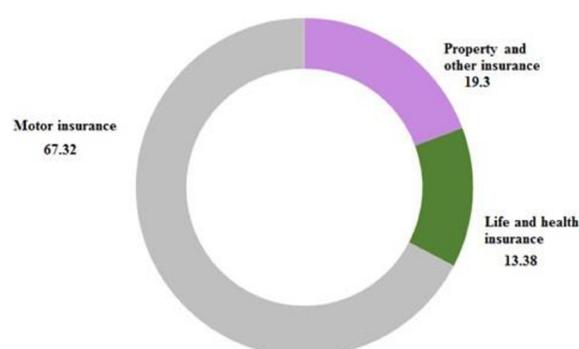


Figure 1. Insurance market structure, January–November (In %)

Source: AFSA, 2021

- Insurance Market Developments in Albania for the period January–September 2022

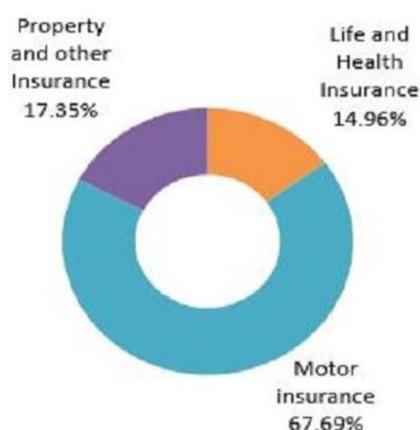


Figure 2. Insurance market structure, January–September (In %)

Source: AFSA, 2022

Gross Written Insurance Premiums income during the period January–September 2022 amounted to over 15,506 million, or 9.46% more compared to January–September 2021. In the period January–September 2022, the number of concluded insurance contracts reached 981,393 registering an increase of 15.49% compared to January–September 2021. (Albanian Financial Supervisory Authority, ASFA, 2022)

- Insurance Market Developments in Albania for January - October 2023
Gross Written Insurance Premiums income during January - October 2023 amounted to over 18,838 million, or 9.64% more compared to January - October 2022. In January - October 2023, the number of concluded insurance contracts reached 1,211,966 registering an increase of 11.22% compared to January - October 2022. (Albanian Financial Supervisory Authority, AFSA, 2023)

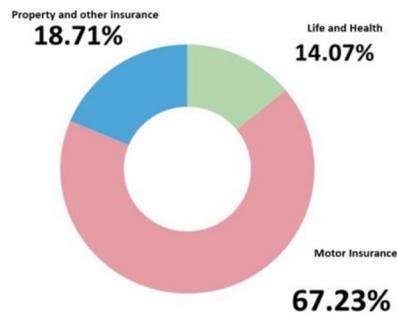


Figure 3. Insurance market structure January- October (In %)

Source: AFSA, 2023

So, as we can compare the data during the years we can notice that although people choose more motor insurance, property and other insurance than life and health insurance, after the pandemic period, the demand for life and health insurance increased from 13.38% in 2021 to 14.96% in 2022 and the demand has decreased but not much, during 2023.

3.3. The Main Difficulties That Insurance Market and Individuals Faced during the Pandemic, COVID-19

The COVID-19 pandemic has had a profound impact on many aspects of the economy and industry in Albania, including security. In this period of new challenges, the insurance market and the Albanian people have faced several changes and new challenges, some of which are presented as follows:

- *Changes in Insurance Preferences:* The pandemic has changed in other ways and Albanian businesses have seen the need for different insurance products.
- *Increased Risks and Payments:* For insurance companies, increased uncertainty and economics in the value of claims coverage payments and insurance premiums. These changes have created challenges in managing the capital and finances of insurance companies.
- *Diminishing Attention to Certain Types of Insurance:* While the demand for insurance policies in general increased, for non-life insurance products, it decreased. Consequently, the incomes from these products decreased too. It was found out and this happened for the mandatory motor insurance portfolio, Green Card and Border Insurance, as a result of the pandemic restrictions, the movement of motor vehicles outside the border was prohibited.
- *Exclusion of Pandemic Risks:* Most injury and health insurance have exclusions for pandemic risks. This has influenced consumer interpretation and demand for coverage during similar situations in the future.
- *Declining Economic Performance:* Declining Economic Performance is a factor that has an impact on a company's finances to pay insurance premiums. This may result in a change in insurance purchasing preferences.
- *Development of Insurance Related to Pandemic Risks:* The COVID-19 pandemic has brought about a profound change in the economic and social environment, affecting consumer behaviour, risks and insurance requirements, as well as the performance and management of insurance companies.

4. RESEARCH ANALYSIS FOR THE CURRENT SITUATION AND EXPECTATIONS OF THE INSURANCE MARKET IN ALBANIA

The research includes an analysis of a questionnaire consisting of 10 questions, which was administered to a sample of 500 individuals. The results of the questionnaires will help us to better understand the current situation and challenges of the insurance market in general and also to know the dynamics of this market from the individual point of view.

4.1. Questionnaire Analysis and Results

Question 1: The first question addressed to the respondents is the age group in which they belong.

Of the 500 respondents, 42% belonged to the 18-30 age group, 28% to the 31-53 age group and 30% to the over 53 age group.

This data helps us understand which age group is most interested in having an insurance service.

Question 2: Choose the category you belong to, individual or business.

Out of 500 respondents, 72% of them turned out to be individual categories and only 28% were business. This allows for an assessment of which insurance services are most favored by these categories.

Question 3: What type of insurance have you bought or want to buy more often?

Most of the respondents prefer life insurance, that is 32% of them, 30% prefer car insurance, 28% property insurance and only 10% health insurance. It is worth noting that the majority of respondents from the business category prefer property insurance.

Question 4: What factors do you think are most important when choosing an insurance company? (The factors are: the quality of service for customers, premium for the service, the reliability of the company and the provision of other advantages).

Among the main factors that influence the choice of an insurance company, 42% of respondents select the quality of service for customers, 30% of them the price they have to pay for the service, 20% of them the reliability of the company and 8% of them the provision of other advantages.

Question 5: Do you think insurance is important for your finances and to manage risks?

68% of respondents think that insurance is moderately important to manage finances and risks, 30% think that they are very important and the rest of 2% think that they are not important at all.

Question 6: Have you ever had an experience of using insurance to carry out an insurance for damage to the car, property, etc.?

66% of respondents have had an experience of using insurance in case of accidents, while 34% of them have not used it.

Question 7: What aspects would you like to improve in the insurance market in Albania?

26% of respondents would like improvement in customer service, 26% would like improvement in transparency and information for customers, 28% expansion of product games, and 20% more competition between insurance companies.

Question 8: Do you think the amount of fee payment (premium) to insurance companies is acceptable and efficient?

92% of the respondents are satisfied with the price they have to pay to benefit from the insurance, while 8% of them think that it is not acceptable and efficient.

Question 9: Have you suggested an insurance company to a friend, family member, or coworker?

94% of the respondents have suggested an insurance company to their acquaintances, and only 6% of them have not yet suggested it.

Question 10: What is your general opinion about the role of the insurance market in the development of Albania's economy?

In general, 2% of the respondents did not think that the insurance market in Albania played an important role in the development of the economy, 12% thought that it had a moderate role and the majority of 86% thought that this market had an important role.

In summarizing the results of the questionnaires, it was found that a large part of the aspects addressed in the questions of the questionnaire required improvement, starting from the range of services to the quality of competition between insurance companies. Insurance companies should be oriented towards providing services to the 31-53 less interested age group.

The prices (insurance premiums) were acceptable to most of them with only a few objections from the respondents who did not consider insurance as important.

Insurance companies must provide clear and understandable information to customers about insurance products, terms, premiums, and benefits. This would help customers make more informed decisions and feel more confident about purchasing insurance.

As a conclusion, regardless of the problems that were found after the survey, in general, the respondents gave a positive and important assessment regarding the role that the insurance market has in the Albanian economy.

5. FUTURE RESEARCH DIRECTIONS

While the existing literature and specifically this study provides a basis for understanding the insurance market in Albania, there are obvious research gaps that require more detailed exploration in this area. Deeper research into consumer behaviour, the impact of socio-cultural

factors on insurance preferences and the role of education in promoting an insurance culture are areas that require attention and may be the object of future research. In addition, as the market continues to evolve in response to technological advances and varying economic conditions, studies investigating the implications of these changes on market dynamics and competition would be valuable contributions.

6. CONCLUSION

- The insurance market in Albania has a positive impact and an important role in economic development, due to the rapid growth of this market.
- The market is dominated by non-life insurance, which accounts for 92.1 % of total GDP volume, with life insurance accounting for 7.4 %.
- The COVID-19 pandemic has changed the dynamics of the insurance market and it has increased the demand for health and life insurance, as well as the need for innovation and benefit from technologies to provide faster and better services.
- One of the main challenges is the lack of consumer awareness and education about insurance policies. Educating the population on the terms and benefits of the policies is necessary to help them make informed choices.
- The insurance market should be committed to educating consumers about the importance of insurance and risk management. Awareness campaigns and financial education programs would help citizens better understand the advantages and limitations of insurance.
- Clear, complete and comprehensible information about insurance should be provided to people, through financial education that can be achieved in the best way, by insurance companies, representatives from the financial supervision authority as well as other specialists in the field.
- Efforts should be made to orient and encourage individuals and businesses, especially for the choice of voluntary insurance, which is very necessary in the conditions in which the world is living today.
- Insurance companies should cooperate closely with the Financial Supervisory Authority of Insurance of Albania and related organizations to help develop and manage the insurance market legally and transparently.
- The open and competitive insurance market stimulates the development of new products and more innovative services. Various specialized insurances, such as Cyber Insurance products, will be part of the range of new products offered.
- Insurance companies should have signed as many reinsurance agreements as possible to cover major damages and unexpected or catastrophic events. This would help ensure the financial stability of the companies.
- Local insurance laws and regulations in Albania, comply with international insurance standards and principles. This has helped and continues to be a guarantee in creating a reliable environment for international investors and clients.

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Banking at a Turning Point

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Abstract: *This paper will show modern banking products which, by all parameters, will eventually lead to the total transformation of banking operations into electronic form, whether desired or not - it's only a matter of time. A SWOT analysis will show the current state of the banking market and where it is heading. The expansion of modern products in banking has already begun, and no one can predict the extent to which it will continue. We can only wait and see how much traditional banking will manage to cope with the pressures brought by the introduction of innovations into their communication system.*

1. INTRODUCTION

The first banks in Europe were places to store valuable items, since individuals feared for their property because of wars, thefts, and state expropriation (Rose & Hudgins, 2005, p. 8), while nowadays all these are accessible through a mobile phone. Banking services and products have experienced a significant boom with the introduction of the Internet and all its advantages. It is hard to imagine how a larger part of services functioned earlier and how much effort, resources, and trouble they demanded. Most of the banks did not immediately accept the Internet as a business channel while today there is almost no bank without its website (Hadžić, 2013, p. 223). Now, everything is instantaneous, functioning without spatial limitations. The devices that are now used in banking are easily portable and in daily use by the clients, enabling them to work and conduct business effortlessly.

2. MODERN BANKING PRODUCTS

The rapid growth of Internet usage and the millions of daily web transactions by the population quickly brought thousands of banks and other financial service providers to the Internet. In the beginning, there was only the information about the products. The latest stage in the development of banking is characterized by the restructuring process of major financial innovations.

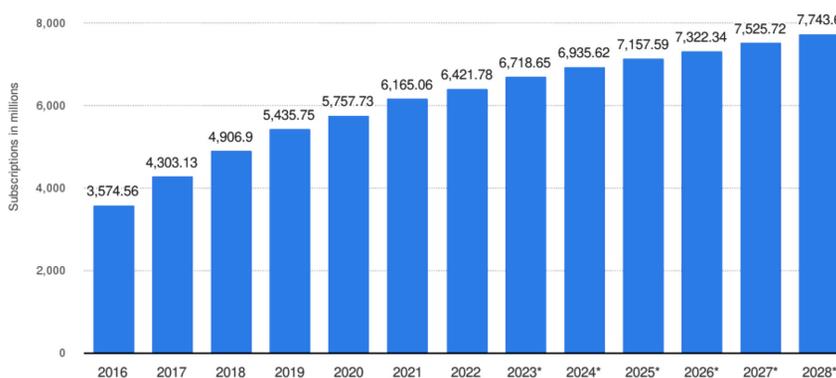
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There comes a significant turning point in the banking business, and these changes are influenced by the following factors: the political relations and processes worldwide; the economic and financial reasons; the innovations of the financial instruments; the motives of legal and business security in the deposit-credit operations; the changes in the behaviour of the clients (Živković et al., 2018, p. 256). The consolidation of the banks and globalization have led to the emergence of large banks, which are increasingly adapting to the changes in both societies and the financial market, thus becoming financial services. Modern banking products that are currently offered by the banks make an immeasurable contribution to the functioning of society. New models of communication and business between a bank and a client occur through mobile banking. The advantages for both customers and banks are significant with the introduction of mobile banking. This includes enhanced access to financial information, the ability to bank conveniently anytime and anywhere, faster transactions, and reduced operational expenses.



* Forecasts from 2023 to 2028 (in millions)

Figure 1. Number of smartphone mobile network subscriptions worldwide from 2016 to 2022

Source: Statista, 2023a

The number of mobile subscribers from Figure 1 shows that the predictions indicate continued growth year by year, amounting to several hundred million per year, and the predictions of mobile phone manufacturers suggest that they are currently at around 70% of the planned number (Espresso, n.d.).

3. ARTIFICIAL INTELLIGENCE AND ITS IMPACT

Artificial intelligence has the potential to transform every sector of society, from healthcare to transportation, from education to finance. It uncovers the opportunities for innovation and growth and has the power to improve people's lives in ways we cannot yet imagine (European Union, 2023). There are mixed opinions regarding the progress of artificial intelligence and its future application in everyday life. The consequences brought about by artificial intelligence concern employees the most, who fear the inevitable increase in unemployment, as indicated in Figure 2. In the past few weeks, major technology companies such as Google, Salesforce and Duolingo have announced layoffs, explaining that the main reason for this is a renewed focus on artificial intelligence. They conclude that the tendency is not only the replacement of workers with artificial intelligence but also the transition towards a smaller number of qualified experts in the field of artificial intelligence (Nova Ekonomija, 2024).

According to the analyses of the European Central Bank, expectations are that the unemployment rate will rise in the first quarter of 2024 and then gradually decline. The long-term forecast of the unemployment rate in 2028 is that it will gradually decrease.

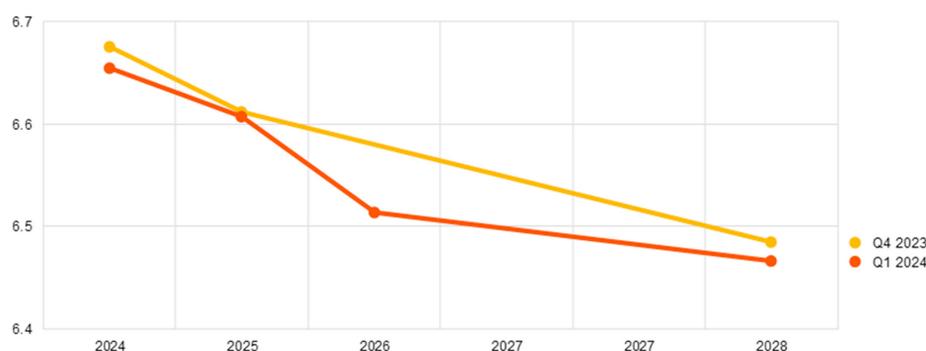


Figure 2. Expected Unemployment Rate

Source: European Central Bank, 2024

One of the indicators that the bank clerks have reasons to worry about this are the numbers shown in the table below (National Bank of Serbia, 2024).

Table 1. Newly registered payment service providers

Year	ATM	POS Terminals	EFTPOS Terminals	VPOS
2023	3052	132799	1	3840
2022	3071	120224	1	3178
2021	3097	114984	3279	2774
2020	3042	97751	2661	2013
2019	2953	91245	2025	1139

Source: National Bank of Serbia, n.d.

4. THE SWOT ANALYSIS OF THE CURRENT SITUATION IN BANKING

The current situation in banking is influenced by all the parameters brought about by the introduction of modern information and communication tools and their integration into the system. The benefits are noticeable, with a decreasing need to physically go to a bank and increasing availability of banking services and transactions that can be conducted online.

Strengths: speed of banking transactions, spatial unlimitedness, number of Internet users, number of mobile phone users.

Weaknesses: insufficient computer literacy of the clients, lack of Internet coverage in all areas.

Opportunities: the expansion of smartwatches, terminals and phones, artificial intelligence, the increase in Internet security, the number of computer users, and the number of smartphone users.

Threats: cybercrime, reduced need for bank clerks, artificial intelligence.

5. CONCLUSION

The SWOT analysis showed the current weaknesses, strengths, opportunities, and threats in banking. The overlaps that occurred in some areas are just an indication that the future is certainly in the use of artificial intelligence, but to what extent and whether with or without personnel, it is now difficult to determine based on these parameters.

Until recently, when we withdrew cash from the bank or wanted to check our account balance, we had to greet a friendly bank clerk (Mishkin, 2006). That is slowly disappearing and comes down to contact with a machine. With the involvement of the Internet in the banking world, banking itself became closer to the younger population, for whom it was only a job for the “elders” until that moment.

The development of smart devices and artificial intelligence dealt a huge blow to the workers in all sectors, even in the banking sector. However, it still resists by overhauling its workforce, the merge of the banks and reorganization.

The long-term forecast of the European Central Bank is positive regarding the unemployment rate, which inspires hope that regrouping, reorganization, reskilling, redirection, and investment in the modernization of the personnel, as well as many other actions, will bear fruit and preserve the application of the human factor in banking, so as not to replace employees, but to complement their work.

The sudden growth of artificial intelligence in 2010 led to an increase in the employment of experts in that field. According to the report issued by the [European Central Bank \(2023\)](#) in November 2023, based on the samples from 16 countries, it is stated that the speculations and previous writings were exaggerated and that the impact of artificial intelligence in all spheres of business is currently positive and without the significant influence and that it remains to be seen how it will behave in the future.

Global investment in artificial intelligence is estimated at 154 billion USD in 2023; of this number, 20.6 billion USD was invested in the banking sector, which is the highest among all analyzed sectors ([Statista, 2023b](#)).

The impact of artificial intelligence on society is still under investigation – it is important to find a balance where the progress of artificial intelligence is ensured as much as the progress of education of the society.

In the last ten years, there was a decrease of around 6000 employees in the banks. More precisely, in the banking sector, as shown by the data of the National Bank of Serbia, the number of employees decreased from 28,394 in 2012 to 22,550 in December 2021 and to 22,154 in November 2022. The main reasons for this decrease are the reduction in the number of banks – because of the consolidation of this sector, which was very intense during these years – as well as digitalization ([Paragraf, 2023](#)). There was a significant increase recorded in remote contracts, which is another indicator that the digital era is spreading in the banking sector.

In January 2024, there were 5.35 billion Internet users worldwide, which accounts for 66.2% of the global population ([Statista, 2024](#)), and that provides a terrific opportunity for online banking, e-banking and mobile banking to enter almost every household.

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The Role of the Central Bank in Green Financing through the Banking Sector in Romania

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Abstract: *Considering the challenges brought by global climate change, the article intends to underline the role of the National Bank of Romania in green financing through the banking sector in Romania, by stimulating the application of good practices in this field and by increasing the interest of banks in applying specific methods to benefit by the opportunities of the climate change European agenda. The research methodology involved the qualitative analysis of the instruments used by the Central Bank in monitoring climate risks in Romania and examining Romanian companies' capacity to face unfavorable developments regarding climate change with impact on bank lending. A comparative analysis is also undertaken considering three top banks in Romania concerning their commitment to promoting sustainability and green financing in banking. The research results highlight the effectiveness and breadth of the methods and work tools used by banks to support the efforts undertaken at the European level to limit the negative effects produced by climate change.*

1. INTRODUCTION

Considering the challenges brought by global climate change, the article intends to underline the role of the National Bank of Romania in green financing through the banking sector in Romania, by stimulating the application of good practices in this field and by increasing the interest of banks in applying specific methods to benefit by the opportunities of the climate change European agenda.

The research methodology involved the qualitative analysis of the instruments used by the Central Bank in monitoring climate risks in Romania and examining Romanian companies' capacity to face unfavorable developments regarding climate change with impact on bank lending. A comparative analysis is also undertaken considering three top banks in Romania concerning their commitment to promoting sustainability and green financing in banking.

The research results highlight the effectiveness and breadth of the methods and work tools used by banks to support the efforts undertaken at the European level to limit the negative effects produced by climate change.

This study is limited by the lack of quantitative analysis as a result of the restricted access to data and information, as well as by not taking into account in the qualitative analysis several banks in the system to truly have a broader picture of the phenomenon in question.

2. LITERATURE REVIEW

A comprehensive overview of the topic of green financing in the banking sector in the European Union is provided by several articles relevant to the scientific community, which address the

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importance of this topic in the current context of the need to ensure sustainable development of economic and social activities in various fields.

An article that provides a review of the scientific literature on green finance in the European Union is “Green Finance in the European Union: A Review of the Literature” by [Claeys et al \(2022\)](#). The authors make an analysis of the evolution of green financing in the European Union, the role of the banking sector in financing the climate transition, as well as the challenges and opportunities manifested at the level of the banking sector in green financing.

[Fici et al. \(2022\)](#), in the study entitled “The role of banks in green finance: A review of the literature”, analyze how banks can contribute to financing the climate transition, as well as the challenges and opportunities faced by banks in this field.

Another recent research by [Ciutacu et al. \(2021\)](#), highlights the factors that determine the development of green finance in the EU banking sector, as well as the challenges and opportunities that the banking sector faces in this area.

The analysis of the impact of green financing on the financial performance of banks in the European Union is what is reflected in the work of [De Felice et al. \(2020\)](#) called “The impact of green finance on European banks”. The authors conclude that green financing can have a positive impact on banks’ financial performance, but this impact depends on some factors, such as the bank’s green financing strategy and the maturity level of the green finance market.

Regarding the role of central banks in green financing through the banking sector in the European Union, the author of the present research made a short selection of articles dealing with the way of choosing monetary and macroprudential policy instruments by central banks to promote green financing in the banking system, as well as the impact of these instruments on green finance. These papers reflect that central banks have an important role to play in promoting green finance, that the impact of monetary and macroprudential policy instruments depends on some factors, and that central banks need to collaborate with other interested institutions and bodies, such as authorities regulatory and private sector to promote green finance.

In the study “The limits of central bank policy for green finance” the authors ([Fici et al., 2020](#)) offer a critical analysis of the position and importance of central banks in green finance. The article debates the limitations of the central banks’ monetary and macroprudential policy tools in promoting green finance. A similar research “The impact of central bank policy on green finance” ([De Felice et al., 2020](#)) highlights the impact of monetary and macroprudential policy instruments of central banks on green finance. The authors show that monetary policy instruments can have a positive impact on green finance, while macroprudential policy instruments can cause a negative impact.

A review of the scientific literature regarding the role of central banks in green finance is provided by the authors in the work “Central Bank Policy for Green Finance: A Review of the Literature” ([Fici et al., 2021](#)), aiming to present the monetary and macroprudential policy instruments that central banks can use them to promote green finance, as well as the impact of these instruments on green finance.

In highlighting the European Central Bank’s (ECB) role in greening the financial system, the article “The European Central Bank’s Role in Greening the Financial System” ([De Felice et al.,](#)

2022) addresses the monetary and macroprudential policy tools that the ECB has used to promote green finance, as well as the impact of these instruments on green finance.

In the article “The Role of Central Banks in Greening the Financial System” (Green et al., 2022) the authors discuss the monetary and macroprudential policy instruments that central banks can use to promote green financing, as well as the impact of these instruments on green finance, is also revealing for the subject pursued.

Regarding the consideration of good practices in green financing through the banking sector in the European Union, the author considered in the selection of articles dealing with this topic, how the recommendations of the European Commission for banks in the field of green financing were taken into account. These recommendations focus on the following aspects: transparency - banks must be transparent about how they finance green projects; inclusiveness - banks must promote access to green financing for all businesses, regardless of size or industry; support for the climate transition - banks must support the climate transition by financing projects and instruments that contribute to the reduction of greenhouse gas emissions.

In the study “Green banking good practices in the European Union: A review of the literature”, the authors Claeys et al. (2023) review the scientific literature on good practices in green finance by presenting the elements of good practices in green finance, the impact them, as well as the challenges and opportunities for implementing good practices in green finance.

The article “The limits of green banking good practices” (Fici et al., 2022) highlights the limitations of good practices in green financing and shows that good practices in green financing cannot solve all the challenges related to financing the climate transition.

Fici et al. (2022) highlight the role of good practices in green finance in supporting the transition to a sustainable economy. The paper concludes that good practice in green finance can help promote a more sustainable economy, but more action and effort is needed to ensure this happens.

3. THE ROLE OF THE NATIONAL BANK OF ROMANIA IN GREEN FINANCING

The challenges brought to the contemporary world by climate changes manifest their influence and impact continuously on human activity, in the development of economic-social processes from the local and regional to the global level.

Corresponding to the unfolding of this phenomenon with multiple effects of a negative nature, human society, respectively the decision-makers from the corporate level to the political and administrative level, have tried to take appropriate measures to smoothen or solve, according to their response capacities, the problems that have arisen and manifested in an increasingly unpredictable evolution.

Inevitably, both banks and banking activity, like all other fields, are under the influence of this phenomenon, so that, at the decision-making level of the central monetary authorities and those in the financial and banking fields, measures and actions were considered to be undertaken based on guidelines and norms adopted in the field to counter and face the pressures of climate change.

In turn, the central monetary authority in Romania, the National Bank of Romania, got involved and is getting involved in the process of responding to these challenges to economic

development by aligning the decisions and measures taken in the monetary and banking fields with international standards, especially to the standards of the European Union, of which Romania is a member state since 2007.

The directions of interest and action in this regard take into account ensuring the sustainability of economic processes at the level of companies, the transition to a circular economy, and the reduction of the carbon footprint in the sense of placing the economy on a path of sustainable and equitable development. These directions considered by the Central Bank of Romania are realized in the knowledge and compliance of the regulations at the European level regarding the realization of sustainable activities and the encouragement of ecological investments and financing, the development of research activity by carrying out studies on the implications of climate change on banking sector in Romania and by following the analyzes associated with the field of sustainability and green economy carried out by other entities, at national and international level, as well as by participating in international cooperation regarding the reduction of risks generated by climate change by formulating recommendations specific to the banking field.

In the current research, the author had in mind highlighting how the National Bank of Romania carries out the monitoring of climate risks in Romania and the examination of the capacity of Romanian companies to deal with unfavorable developments regarding climate change with an impact on bank lending.

Corresponding to the research guidelines regarding the implications of climate change on the Romanian banking sector and green financing, the National Bank of Romania carries out a series of reports and studies in cooperation with partner institutions and bodies under the auspices of the National Committee for Macroprudential Supervision, among which can be listed Climate risk monitoring tables on the banking sector in Romania (annual edition starting with 2021), Report of the working group of the National Committee for Macroprudential Supervision for supporting green financing (2022), Analysis of the working group of the National Committee for Macroprudential Supervision for the sustainable growth of financial intermediation (2022), but also the Climate Change Survey: analysis of trends and preparation of financial institutions, 2023.

Regarding the monitoring of climate risks in the Romanian banking sector, the last study carried out by the BNR in 2023 reflects, from the point of view of physical risks, the fact that “The banking exposure of Romanian companies located in sectors that could be affected by physical risks (with a medium and high intensity) remains relatively moderate (16 percent for flood risk, 5.5 percent for drought risk and 7 percent in case of risk of high temperatures)” (BNR, 2023a, p. 10) on a decreasing trend compared to 2022. The document also specifies, in this respect, the fact that Romanian companies in sectors possibly affected by physical risks of medium and high intensity are important companies for the economy with a weight in the gross added value at the aggregate level 2022 located between 3 and 14 percent and that, at the same time, the degree of preparedness of Romanian companies for climate change in 2022 remained constant compared to the previous year (BNR, 2023a, p. 11).

From the point of view of the transition risk, the document states that “bank lending to brown companies continued to increase at a robust pace, [...] the bank’s exposure to these companies reached 98 billion lei at the end of the month September 2023 (+8 percent in annual terms), representing 52.3 percent of total exposure to non-financial companies (relatively constant compared to September 2022)” (BNR, 2023a, p. 14). Climate-relevant non-financial companies (so-called brown companies) are defined according to the Methodology for the Identification of Climate-Relevant

Economic Sectors climate view presented in the Report of the CNSM Working Group on supporting green financing (Comisia Națională pentru Supravegherea Sistemului Financiar, 2023, p. 112).

Related to the same theme, the study shows that “the non-performing loan rate (NPL rate) granted to brown companies recorded a value of 3.6 percent in September 2023 (-0.7 percentage points compared to September 2022), standing below the value at the aggregate level of 4 percent” (BNR, 2023a, p.15) in the context in which “the probability of default remains, however, 0.2 percentage points higher in the case of brown companies, compared to that at the aggregate level” (BNR, 2023a, p.15).

Regarding green financing in Romania, the document shows that 2 green bond issues were registered in 2022 in the amount of 247.2 million euros, and in 2023 another 2 green bond issues of 718.3 million euros. The National Bank of Romania shows that in September 2023 non-financial companies benefited from a volume of green bank loans of 3 billion lei (1.6 percent of the entire portfolio of bank loans granted to the sector), a value almost 3 times higher than in the corresponding month of the previous year. The areas of economic activity towards which green bank loans were directed were represented by green buildings (46 percent), electricity and heating and cooling systems (24 percent), and energy efficiency investments (9.7 percent) (BNR, 2023a, p. 16).

Correspondent to the document entitled Survey on access to finance of non-financial companies in Romania in 2022, taking into account the level of importance, “companies have identified the following vulnerabilities with potential negative impact, as a result of the materialization of climate risks: (i) the effects on employees, such as the risk of illness or climate migration (43 to percent), (ii) access to energy and water (42 percent), (iii) business infrastructure according to work points or headquarters (e.g.: fixed assets, storage, land, network, and telecommunications platforms), as a result of an increase in the incidence and intensity of extreme weather events or natural disasters (36 percent) and (iv) market demand, changing consumer preferences or location (33 percent from 20 percent in the precedent of the Survey)” (BNR, 2022, p. 12).

On the other hand, focusing our attention on how the National Bank of Romania influences the decisions of banks in Romania regarding the consideration of climate and environmental risks in their activity, the Climate Change Survey: analysis of trends and preparation of financial institutions from 2023 reveals the following considerations:

- a) financial credit institutions in Romania include floods, extreme weather, and drought as relevant risks in the assessment of physical risk exposure (BNR, 2023b, p. 10),
- b) scenario-based analyses to investigate the potential impact of climate change on the portfolio are rarely considered in the banks’ toolkit (BNR, 2023b, p. 10),
- c) most of the credit institutions establish climate/environmental risk reduction policies or have taken measures to reduce climate risk (BNR, 2023b, p. 10),
- d) To finance activities whose main purpose is to reduce carbon emissions, but also to diversify the portfolio and to increase the rate of green assets, some of the credit institutions in Romania have issued or intend to issue green bonds (BNR, 2023b, p. 17).

Through the brief presentation of the above elements, it can be said that the National Bank of Romania has at its disposal a whole series of methods and instruments for monitoring climate risks in Romania and for examining the ability of Romanian companies to deal with unfavorable developments regarding climate change with impact on bank lending, as well as to influence and supervise how the banks in the system take into account the principles of sustainability in their activity and promote green financing within the Romanian economy.

4. COMPARATIVE ANALYSIS OF THREE ROMANIAN BANKS REGARDING THE PROMOTION OF SUSTAINABILITY AND GREEN FINANCING

The comparative study considered by the author refers to three banks from the top 10 Romanian banks in order of assets held, namely Banca Transilvania, Raiffeisen Bank Romania, and Banca Comercială Română. As three of the most important banks in Romania, they have adopted commitments to promote sustainability and green financing in banking.

All three banks have common goals in sustainability and green finance. These objectives include: reducing greenhouse gas emissions, promoting the transition to a circular economy, and supporting the sustainable development of local communities.

Banca Transilvania, Raiffeisen Bank Romania, and Banca Comercială Română have implemented different strategies to achieve their objectives in the field of sustainability and green financing.

Thus, Banca Transilvania has a sustainability strategy that covers both social and environmental aspects. The bank has developed several green products and services, such as green loans for energy-efficient buildings and green bonds. Banca Transilvania also supports its clients' sustainability projects through a consulting and financing program.

Raiffeisen Bank Romania has a sustainability strategy that focuses on three areas: climate, natural resources, and communities. The bank has developed some green products and services, such as green loans for renewable energy and green bonds. Raiffeisen Bank Romania also supports its clients' sustainability projects through a grant program.

Banca Comercială Română has a sustainability strategy that focuses on four areas: climate, natural resources, society and governance. The bank has developed several green products and services, such as green loans for public transport and green bonds. Banca Comercială Română also supports its clients' sustainability projects through a consulting and financing program.

Banca Transilvania has a sustainability strategy that covers both social and environmental aspects. The strategy focuses on the following areas: energy efficiency, renewable energy, sustainable transport, circular economy, diversity and inclusion

Banca Transilvania uses some tools and means to achieve its sustainability objectives, such as:

- **International sustainability standards:** Banca Transilvania is committed to complying with international sustainability standards, such as the Global Reporting Initiative (GRI) and the Task Force on Climate-related Financial Disclosures (TCFD).
- **Sustainability reports:** Banca Transilvania publishes an annual sustainability report detailing its progress in the field of sustainability.
- **Education and awareness:** Banca Transilvania organizes education and awareness events in the field of sustainability.

In its 2022 sustainability report, Banca Transilvania reported the following sustainability progress: Greenhouse gas emissions - Banca Transilvania reduced its greenhouse gas emissions by 22% in 2022 compared to 2021, sustainability projects - Banca Transilvania financed 100 sustainability projects in 2022, worth 1.5 billion lei, diversity and inclusion - Banca Transilvania increased the share of women among its employees to 40% (Banca Transilvania, 2022).

Raiffeisen Bank Romania has a sustainability strategy that focuses on three areas: climate, natural resources and communities (Raiffeisen Bank Romania, 2022). Raiffeisen Bank Romania has implemented a series of actions to achieve its sustainability objectives, such as:

- **Improving transparency:** Raiffeisen Bank Romania publishes an annual sustainability report detailing its progress in the field of sustainability.
- **Education and awareness:** Raiffeisen Bank Romania organizes education and awareness events in the field of sustainability.
- **Investments in research and development:** Raiffeisen Bank Romania invests in research and development to develop new green products and services.

Raiffeisen Bank Romania uses a number of tools and means to achieve its sustainability objectives, including:

- **International sustainability standards:** Raiffeisen Bank Romania is committed to complying with international sustainability standards, such as GRI and TCFD.
- **Ecological labelling:** Raiffeisen Bank Romania labels its green products and services to facilitate their identification by customers.
- **Financial support:** Raiffeisen Bank Romania offers financial support for its clients' sustainability projects

Raiffeisen Bank Romania has made significant progress in implementing its sustainability strategy. In 2022, Raiffeisen Bank Romania granted green loans worth 1.2 billion lei, invested 100 million euros in green infrastructure and published its first sustainability report.

The Romanian Commercial Bank (BCR) has a sustainability strategy that focuses on four areas: climate, natural resources, communities, diversity and inclusion.

To achieve its sustainability goals, BCR has implemented a number of strategies, such as

- **Development of green products and services:** BCR has developed a number of green products and services such as green loans, green bonds and green insurance products.
- **Green Infrastructure Investments:** BCR invests in green infrastructure such as energy efficient buildings and renewable energy projects.
- **Partnership with other stakeholders:** BCR collaborates with other stakeholders such as regulators, investors and environmental organizations to promote sustainability. BCR uses a number of tools and means to achieve its sustainability goals:
- **International sustainability standards:** BCR is committed to international sustainability standards such as GRI and TCFD.
- **Eco-labelling:** BCR labels its products and services green to make it easier for customers to identify them.
- **Financial support:** BCR provides financial support for its clients' sustainability projects.

In 2022, BCR granted green loans worth 1 billion lei, invested 100 million euros in green infrastructure and published its first sustainability report.

All three banks have made progress in implementing their sustainability and green finance strategies. In 2022, Banca Transilvania granted green loans worth 1.5 billion lei, Raiffeisen Bank Romania granted green loans worth 1.2 billion lei, and Banca Comercială Română granted green loans worth 1 billion lei.

To strengthen their commitment to sustainability and green finance, banks could consider the following measures:

- **Increased transparency:** Banks could publish more information about their sustainability activities, including the green products and services they offer, the sustainability projects they finance, and their impact on the environment and society.
- **Collaboration with other stakeholders:** Banks could collaborate with other stakeholders such as regulators, investors and environmental organizations to promote sustainability and green finance.

Investing in research and development: Banks could invest in research and development to develop new green products and services and improve their environmental risk assessment processes.

Banca Transilvania, Raiffeisen Bank Romania and Banca Comercială Română are committed to promote sustainability and green financing in banking in Romania. All three banks have adopted different strategies, but all have made progress in implementing these strategies.

5. CONCLUSION AND RECOMMENDATIONS

This study is limited by the lack of quantitative analysis as a result of the restricted access to data and information, as well as by not taking into account in the qualitative analysis several banks in the system to truly have a broader picture of the phenomenon in question.

Subsequent research of this study undertaken by the author may consider some future trends of green financing in the banking sector in Romania:

- **Growing volume of green finance:** The volume of green finance is expected to grow in the coming years as banks continue to better adapt their financial instruments and products to support the sustainability of economic activity.
- **Development of new green products and services:** Banks will continue to develop new green products and services to meet the increasingly diverse needs of customers, especially related to renewable energy projects, energy efficiency and sustainable transport.
- **Increasing demand for green finance:** Increasing concerns about climate change and environmental issues will lead to an increase in demand for green finance. This will create new opportunities for banks to offer sustainable financial products and services.

6. CONCLUSION

The National Bank of Romania has at its disposal a whole series of methods and instruments for monitoring climate risks in Romania and for examining the ability of Romanian companies to deal with unfavorable developments regarding climate change with impact on bank lending, as well as to influence and supervise how the banks in the system take into account the principles of sustainability in their activity and promote green financing within the Romanian economy.

As a result of the comparative analysis, Banca Transilvania, Raiffeisen Bank Romania and Banca Comercială Română are committed to promoting sustainability and green financing in banking in Romania. All three banks have adopted different strategies, but all have made progress in implementing these strategies.

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Bridging Markets: Exploring Short-Term Trends in Cryptocurrencies and Green Finance

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Abstract: *This study examined the short-term dynamics between Bitcoin, Ethereum, Litecoin, Clean Energy Fuels, and WilderHill Clean Energy over the period from January 1, 2020, to May 30, 2023. Bitcoin saw substantial price fluctuations over 10 days, highlighting its inherent volatility and rapid shifts in value. In contrast, Ethereum and Litecoin showed more gradual fluctuations. The price movements of digital currencies exhibited a mix of positive and negative trends when compared to the Clean Energy Fuels and WilderHill indexes, suggesting a correlation with energy-related assets. Clean Energy Fuels had significant positive trends, hence emphasizing the inherent instability within the clean energy industry. The WilderHill Clean Energy index demonstrated moderate positive associations with Bitcoin and Clean Energy Fuels, while exhibiting dynamic variations with Litecoin. These findings offer valuable insights for investors seeking to build sustainable portfolios, offering guidance on how to adjust their strategies in the face of economic challenges.*

1. INTRODUCTION

In recent years, the world has witnessed a concerning increase in environmental risks, primarily driven by the rapid rise in carbon emissions. This environmental crisis poses a significant threat to ecosystems, human health, and overall well-being. The emergence of the new green economy represents a notable and promising example of sustainable development. This concept encompasses a harmonious balance between economic growth, environmental preservation, and social well-being. Investors, policymakers, government entities, international organizations, and researchers are all considering these data (Vona et al., 2015; Saeed et al., 2021; Attarzadeh & Balcilar, 2022).

The advent of digital currencies has had a profound impact on financial markets, in terms of decentralization, financial inclusion, and diversification. However, the volatility of these markets, regulatory challenges, and ongoing technological developments are important factors to consider when assessing the role of cryptocurrencies in the broader financial landscape. The cryptocurrency market is still evolving, and its long-term impact on traditional finance continues to be the subject of ongoing research and debate (Bariviera & Merediz-Solà, 2020; Okorie & Lin, 2020; Naeem et al., 2023).

In the realm of research, and considering the existing literature, it appears that the majority of empirical studies have overlooked the analysis of how shocks impact both green markets and cryptocurrencies. We believe that gaining a comprehensive understanding of these relationships is

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crucial for policymakers and investors with a focus on the environment. It enables them to adjust their investment portfolios and develop effective risk mitigation strategies. The 2020 pandemic underscored the importance of comprehending the interactions between various financial markets to manage market instability effectively. Cryptocurrencies have, in some cases, served as protection during times of market turbulence. This is precisely why our study focuses on examining short-term price movements, especially in 10-day periods, among cryptocurrencies such as Bitcoin (BTC), Ethereum (ETH), Litecoin (LTC), and green energy indexes like Clean Energy Fuels (CLNE) and WilderHill Clean Energy (ECO), from January 1, 2020, to May 30, 2023.

The subsequent sections of this article are structured as follows: Section 2 undertakes a comprehensive literature review, while Section 3 delineates the employed methodology and details the data utilized. Section 4 articulates the empirical findings, and Section 5 furnishes the concluding remarks. Lastly, Section 6 provides substantial practical implications for various players, including investors, financial institutions, and policymakers.

2. LITERATURE REVIEW

Several studies have delved into the potential of clean energy as a safe haven compared to conventional energy sources. Clean energy stocks represent a relatively new asset class for investment, and these assets can be highly volatile. As of late, green bonds have become a way to protect against climate change and the transition to green energy. At the same time, cryptocurrencies have become popular as a way to diversify a portfolio. Previous research might have looked at how environmental concerns and cryptocurrencies might affect the performance of green financial assets.

Authors [Ozdurak et al. \(2022\)](#) and [Ren and Lucey \(2022\)](#) investigated the hedging and refuge properties of a broad range of clean energy indexes concerning cryptocurrencies. [Ozdurak et al. \(2022\)](#) demonstrate that digital currencies exhibit weak hedging and safe haven characteristics, potentially challenging the rebalancing of sustainable portfolios. In contrast, [Ren and Lucey \(2022\)](#) highlight a weak connection between clean energy and cryptocurrencies, implying the potential use of clean energy as a hedging and diversification tool for cryptocurrencies in the future.

Authors [Sharif et al. \(2023\)](#) and [Arfaoui et al. \(2023\)](#) explored the connectivity between green economy indexes and cryptocurrencies. [Sharif et al. \(2023\)](#) reveal strong links between sustainable indexes and clean cryptocurrencies compared to dirty cryptocurrencies, suggesting that green investors may not include cryptocurrencies as safe haven assets in their sustainable portfolios. Complementarily, [Arfaoui et al. \(2023\)](#) concluded that green bonds are the least integrated with other financial markets, suggesting their significant role in providing diversification benefits to investors.

In addition, [Dias et al. \(2023\)](#) demonstrate that clean energy stock indexes may offer a viable safe haven for dirty energy cryptocurrencies. However, the precise associations differ depending on the specific cryptocurrency under analysis. The implications of this study's results are significant for investment strategies, and this knowledge can inform decision-making procedures and facilitate the adoption of sustainable investment practices. Complementarily, [Anwer et al. \(2023\)](#) suggest that environmentally sustainable indexes and cryptocurrencies show co-movements during the 2020 pandemic. However, in normal times, these assets largely remain dissociated, arguing that both asset classes can serve as a hedge for each other.

Within the context of the existing scholarly discourse, this study accentuates the imperative of investigating the near-term price dynamics between cryptocurrencies and clean energy indexes. The overarching objective is to assess the potential viability of these assets as effective hedging instruments. The impetus behind this research is primarily propelled by two salient considerations: firstly, the escalating environmental apprehensions entwined with the energy consumption patterns intrinsic to cryptocurrencies, and secondly, the increasing emphasis on the adoption of sustainable investment paradigms within the contemporary financial landscape.

3. METHODOLOGY

3.1. Data

The data used in the study comprises the price indexes of the cryptocurrencies Bitcoin (BTC), Ethereum (ETH), Litecoin (LTC), and the green energy indexes Clean Energy Fuels (CLNE) and WilderHill Clean Energy (ECO). All prices in the study are quoted in US dollars and span the period from January 1, 2020, to May 30, 2023.

3.2. Methods

This study will unfold in distinct phases. The initial stage will involve the application of fundamental descriptive statistical measures to provide an overview of the sample under examination. In the subsequent phase, we aim to verify the stationarity of the time series data. To this end, we will employ the panel unit root test proposed by Phillips and Perron (1988), supplemented by Fisher's chi-square transformation and Choi (2001) methodology. This statistical test generates a test statistic that conforms to a chi-square distribution. By examining the significance level of this test statistic, we can determine whether a unit root is present, a crucial aspect for understanding the data's behavior. This approach calculates the test statistic using the maximum likelihood estimation of the autoregressive model, providing an additional perspective on data stationarity. Subsequently, to explore short-term relationships, we will employ the Structural Vector Autoregressive (SVAR) model. The SVAR model extends the Vector Autoregressive (VAR) model, enabling the simultaneous modeling of multiple time-series variables through a system of linear equations. This method allows us to examine the interaction and dynamics of these variables in the short term. Furthermore, to ascertain whether data movements are characterized by positive or negative patterns, we will estimate Impulse Response Functions (IRF). This will be achieved through Monte Carlo simulations involving 1,000 repetitions. This rigorous approach enhances the reliability and robustness of our results, providing a more comprehensive understanding of the behavior of these assets during the 2020 pandemic and the 2022 Russian invasion of Ukraine.

4. RESULTS

Figure 1 illustrates the evolution, in returns, of various assets, including cryptocurrencies such as Bitcoin (BTC), Ethereum (ETH), Litecoin (LTC), and green energy indexes like Clean Energy Fuels (CLNE) and WilderHill Clean Energy (ECO). The data span from January 1, 2020, to May 30, 2023. The graph accentuates the notable evolution in the returns of these assets. In the context of digital currencies, a distinct trend emerges from 2021 marked by heightened volatility. BTC stands out, reaching an unprecedented peak, surpassing \$60,000 in April 2021. This surge is primarily attributed to increased institutional interest and the growing adoption of

cryptocurrencies by major financial institutions. Notably, this rise in the value of Bitcoin also had a contagion effect on other alternative cryptocurrencies, particularly ETH and LTC, both experiencing substantial price increases during the same period. In the domain of sustainable energies, significant price fluctuations are observed, especially during the initial months of 2020, with this volatility intensifying in 2021. However, in 2022, there appears to be a relative decrease in volatility. This shift may be associated with the perception that clean energy systems are less susceptible to geopolitical turbulence. This could suggest a maturation or stabilization of the green energy sector, which can be viewed as a positive signal for investors and advocates of clean energy solutions.

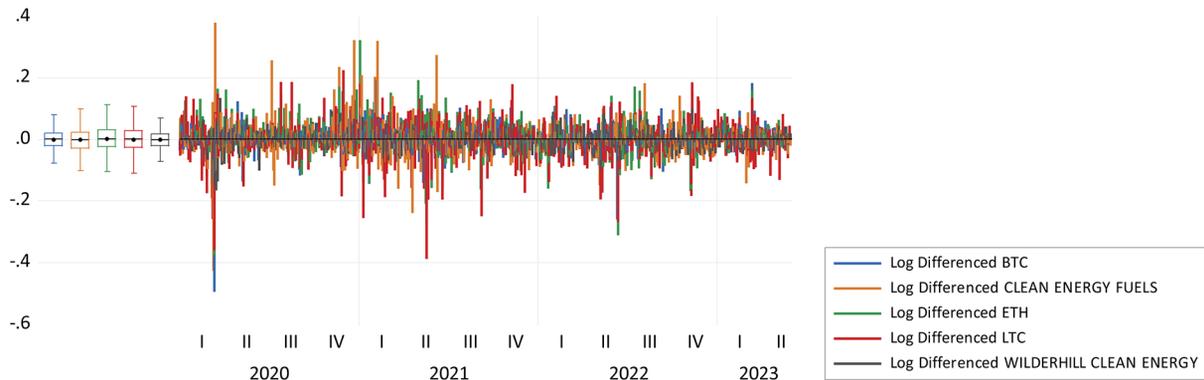


Figure 1. Evolution in returns for cryptocurrencies and sustainable energy stock indexes, spanning from January 2020 to May 2023

Source: Own elaboration (software Eviews12)

In **Figure 2**, we present the mean returns of the cryptocurrencies Bitcoin (BTC), Ethereum (ETH), Litecoin (LTC), and the green energy indexes Clean Energy Fuels (CLNE) and WilderHill Clean Energy (ECO) for the period from January 1, 2020, to May 30, 2023. Through our analysis, we observe that the mean returns are positive for both cryptocurrencies BTC (0.001519), ETH (0.003023), LTC (0.00090), and sustainable energy indexes CLNE (0.000597) and ECO (0.000103).

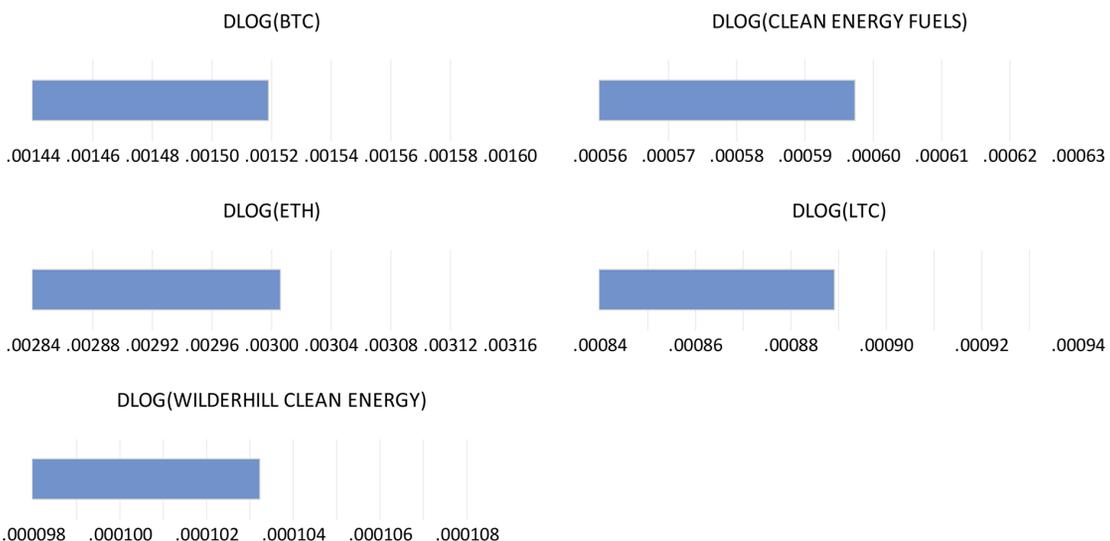


Figure 2. Evolution of mean returns, for cryptocurrencies and sustainable energy stock indexes, spanning from January 2020 to May 2023

Source: Own elaboration (software Eviews12)

Figure 3 illustrates the standard deviations of the cryptocurrencies Bitcoin (BTC), Ethereum (ETH), Litecoin (LTC), and the green energy indexes Clean Energy Fuels (CLNE) and WilderHill Clean Energy (ECO) for the period from January 1, 2020, to May 30, 2023. Notably, the digital currency LTC (0.058675) exhibits the highest degree of variation from the mean, with ETH (0.055491), CLNE (0.055140), BTC (0.045618), and ECO (0.031364) following in descending order of dispersion.

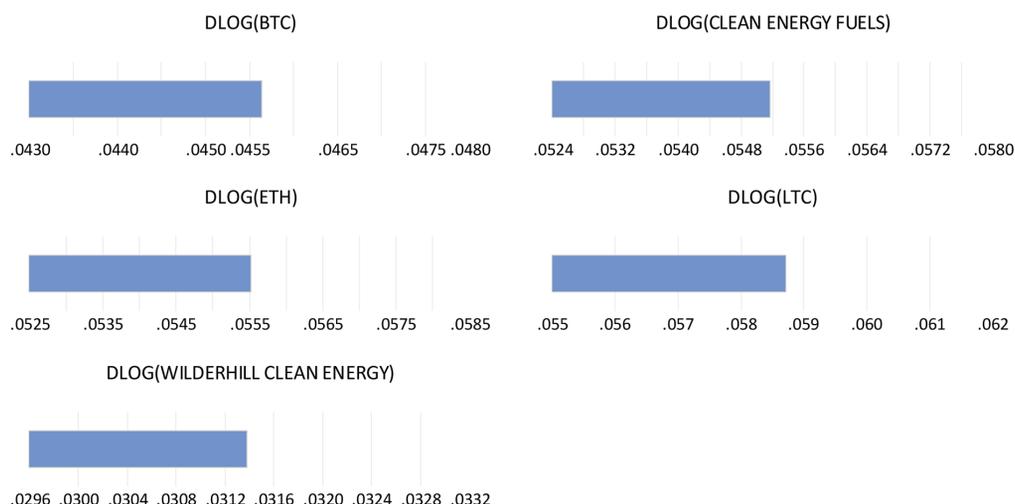


Figure 3. Evolution of standard deviations for cryptocurrencies and sustainable energy stock indexes, spanning from January 2020 to May 2023

Source: Own elaboration (software Eviews12)

Figure 4 depicts the skewness of the cryptocurrencies Bitcoin (BTC), Ethereum (ETH), and Litecoin (LTC), as well as the green energy indexes Clean Energy Fuels (CLNE) and WilderHill Clean Energy (ECO), from January 1, 2020, to May 30, 2023. Our analysis shows that digital currencies, specifically BTC (-1.677120), LTC (-1.00626), and ETH (-0.590501), have considerable negative skewness. In terms of sustainable energy indexes, ECO (-0.248899) has negative skewness, albeit the value is less severe when compared to cryptocurrencies. CLNE (0.545892), on the other hand, has positive skewness. The reference value is zero, indicating that we are dealing with non-Gaussian distributions.

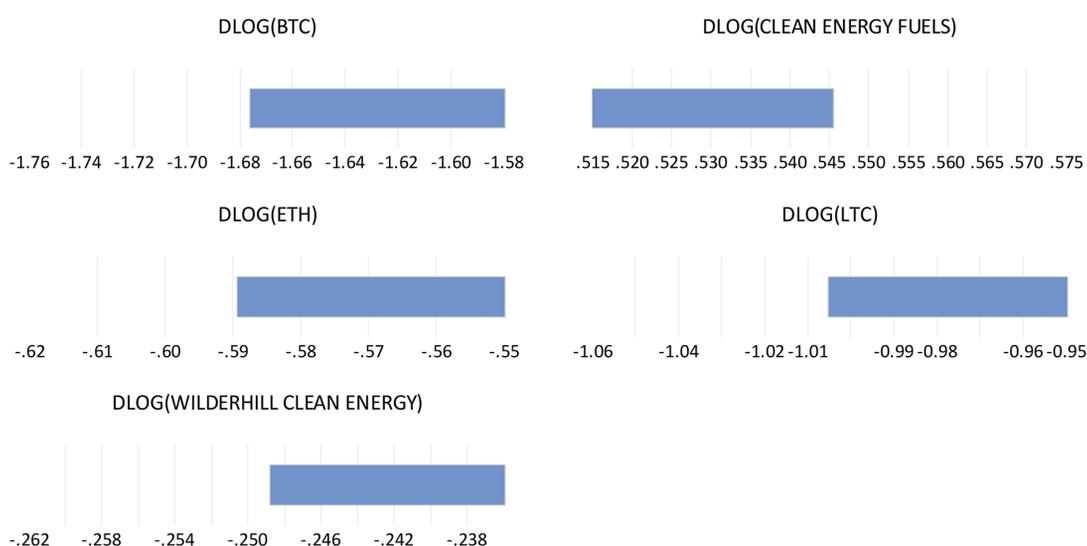


Figure 4. Evolution of skewness for cryptocurrencies and sustainable energy stock indexes, spanning from January 2020 to May 2023

Source: Own elaboration (software Eviews12)

Figure 5 shows the kurtoses of the cryptocurrencies Bitcoin (BTC), Ethereum (ETH), and Litecoin (LTC), as well as the green energy indexes Clean Energy Fuels (CLNE) and WilderHill Clean Energy (ECO), during the period January 1, 2020, to May 30, 2023. Our investigation reveals that digital currencies, specifically BTC (20.74109), ETH (9.057288), and LTC (8.812668), have high kurtoses. In terms of sustainable energy indexes, CLNE (13.86749) has prominent kurtoses, but the ECO (4.957446) has less prominent values as compared to the assets under consideration. These values deviate significantly from 3 (the reference value), validating the suspicions confirmed in the skewness analysis. In other words, we are dealing with non-Gaussian distributions, as the reference values for skewness and kurtosis are different from 0 and 3, respectively.

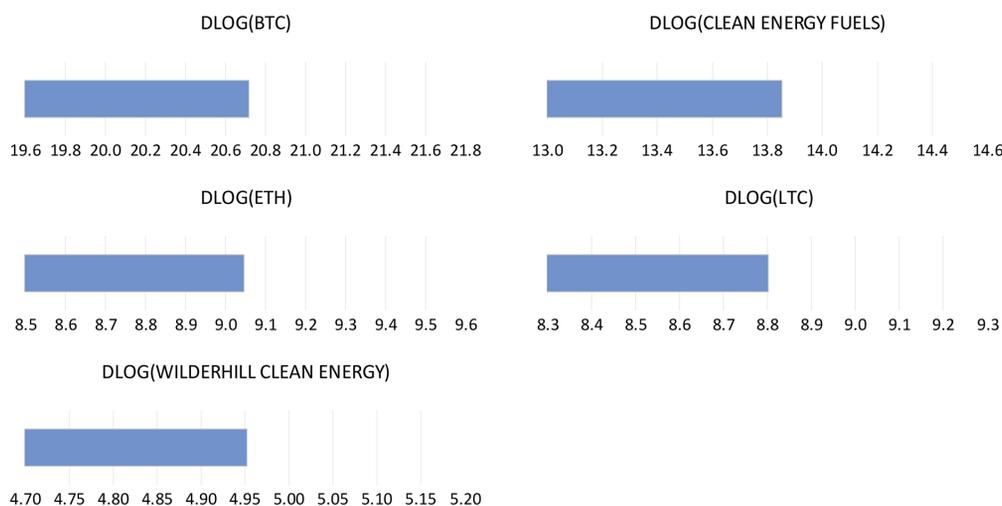


Figure 5. Evolution of kurtoses for cryptocurrencies and sustainable energy stock indexes, spanning from January 2020 to May 2023

Source: Own elaboration (software Eviews12)

In **Table 1**, we present the unit root stationarity test, which we applied to the cryptocurrencies Bitcoin (BTC), Ethereum (ETH), Litecoin (LTC), and the green energy indexes Clean Energy Fuels (CLNE) and WilderHill Clean Energy (ECO) from January 1, 2020, to May 30, 2023, using the **Phillips and Perron (1988)** panel unit root test supplemented by the Fisher chi-square transformation and **Choi's (2001)** methodology. Initially, we estimate the model in levels and find that closing prices have unit roots. We apply a logarithmic transformation in first differences (returns) for this purpose, indicating the rejection of the null hypothesis and proving homoscedasticity in the time series, a fundamental assumption for the SVAR.

Table 1. Panel unit root test by **Phillips and Perron (1988)**, applied to cryptocurrencies and sustainable energy stock indexes, from January 2020 to May 2023

Null Hypothesis: Unit root (individual unit root process)			
Method	Statistic	Prob.	
PP - Fisher Chi-square	1316.95	0.0000	
PP - Choi Z-stat	-35.7771	0.0000	
Intermediate Phillips-Perron test results			
Series	Prob.	Bandwidth	Obs.
BTC	0.0000	4.0	888
CLNE	0.0000	9.0	888
ETH	0.0000	4.0	888
LTC	0.0000	2.0	888
ECO	0.0000	9.0	888

Source: Own elaboration (software Eviews12)

Figure 6 depicts the Vector Autoregression (VAR) model's residue structure, incorporating the Cholesky decomposition. The focus of the analysis is on the cryptocurrencies Bitcoin (BTC), Ethereum (ETH), and Litecoin (LTC), as well as the green energy indexes CLNE and ECO, for the period from January 1, 2020, to May 30, 2023. To achieve the absence of autocorrelation in the residues, we use the information criterion LR: sequential modified LR test statistic (each test at a 5% level) for a lag of 10 days. Subsequently, we estimate the LM and verify that autocorrelation is absent for the lag of 11. The present findings provide evidence that the necessary conditions for ensuring robustness in the SVAR results are satisfied, as indicated by the stationarity of the returns and the absence of autocorrelation in the residuals.

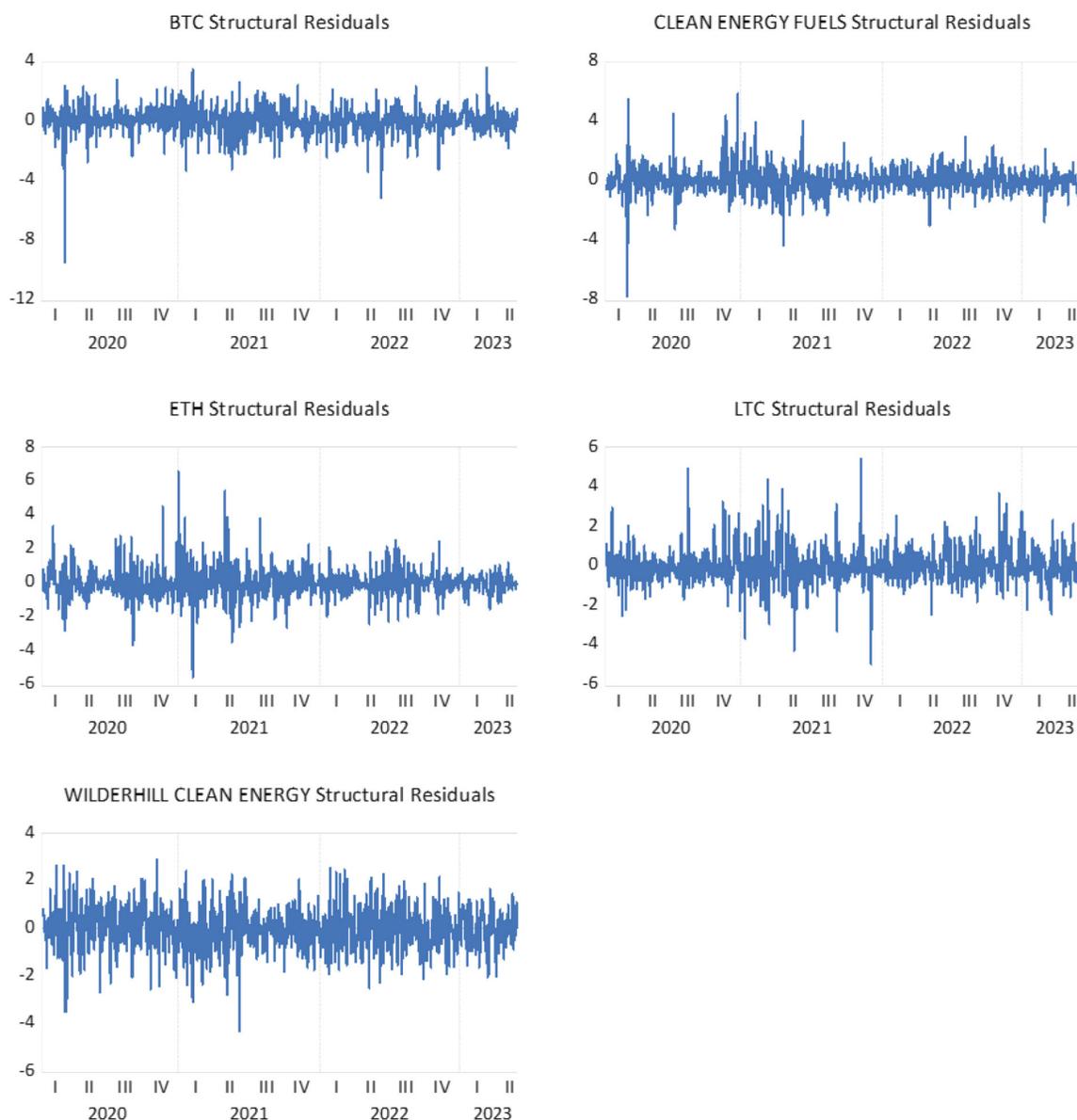


Figure 6. VAR Structural Residuals using Cholesky Factors, applied to cryptocurrencies and sustainable energy stock indexes, spanning from January 2020 to May 2023

Source: Own elaboration (software Eviews12)

In **Figure 7**, the results of Impulse Response Functions (IRF) using Monte Carlo simulations (1000 repetitions) are presented and applied to various assets, including Bitcoin (BTC), Ethereum (ETH), Litecoin (LTC), and the green energy indexes Clean Energy Fuels (CLNE) and WilderHill

Clean Energy (ECO). The data spans from January 1, 2020, to May 30, 2023. The IRF graphs provide crucial insights into how these assets respond at 10-day intervals. BTC stands out, displaying substantial positive and negative movements, with no significant differences between digital currencies and sustainable energy indexes. The CLNE index also exhibits pronounced co-movements; with BTC, these co-movements are positive, while with ETH, LTC, and WilderHill, the co-movements vary between positive and negative. The digital currency ETH has minimal co-movements with BTC and pronounced, both positive and negative, co-movements with clean energy indexes, with ECO showing no significant differences in these latter assets. Regarding the digital currency LTC, the co-movements are negative and significant. LTC has weak co-movements with the digital currencies BTC and ETH; however, with the Clean Energy index, it shows pronounced positive co-movements, and with ECO, the co-movements are both positive and negative. The ECO index exhibits moderate positive co-movements with BTC and CLNE, as well as moderate but both positive and negative co-movements with the currency ETH. However, with the digital currency LTC, the co-movements are not only positive and negative but also quite pronounced.

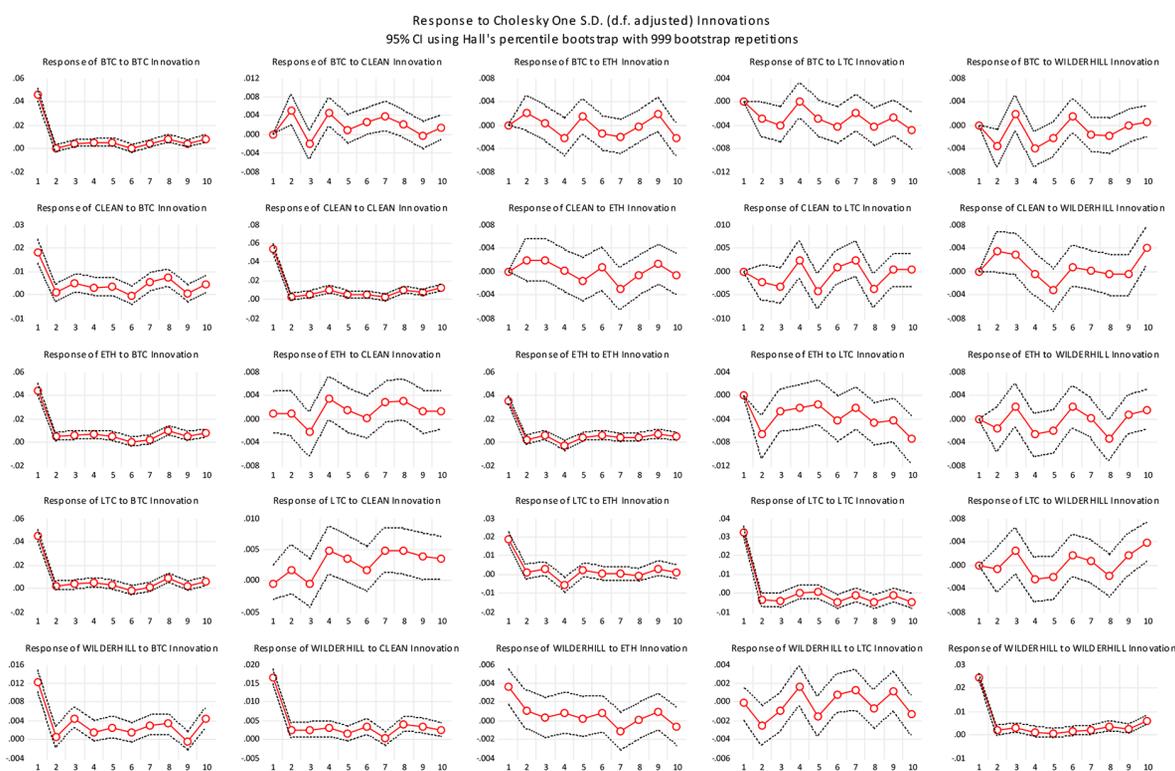


Figure 7. Impulse response functions with Monte Carlo simulations, applied to cryptocurrencies and sustainable energy stock indexes, spanning from January 2020 to May 2023

Source: Own elaboration (software Eviews12)

5. CONCLUSION

This study examined short-term relationships between the cryptocurrencies Bitcoin (BTC), Ethereum (ETH), Litecoin (LTC), and the green energy indexes Clean Energy Fuels (CLNE) and WilderHill Clean Energy (ECO) from January 1, 2020, to May 30, 2023. The IRF methodology with Monte Carlo simulations (1.000 repetitions) was employed to yield robust results on how these assets co-move during the events of 2020 and 2022. Firstly, BTC exhibited notable and dynamic price movements over 10-day windows, with significant positive and negative changes. This underscores the high volatility and potential for rapid value shifts in BTC.

Conversely, ETH and LTC demonstrated relatively smaller and more gradual movements when compared to BTC. These two digital currencies showed a combination of positive and negative price oscillations when correlated with the CLNE and ECO indexes, suggesting some degree of interaction with these energy-related assets. CLNE displayed sharp and perceptible price movements, primarily in a positive direction. This emphasizes volatility in the clean energy sector, particularly in this index. The WilderHill Clean Energy, while showing some moderate positive movements concerning BTC and the CLNE, exhibited a more dynamic pattern when linked to LTC, with both positive and negative fluctuations.

These findings underscore the diverse and dynamic nature of relationships and price movements within these assets. Notably, Bitcoin's volatility stands out, showcasing distinct patterns compared to digital currencies and energy indexes, which exhibit varying degrees of correlation and interaction. This analysis emphasizes the significance of comprehending the intricate dynamics between different asset classes and their corresponding price fluctuations, serving as valuable insights for both investors and researchers.

6. PRACTICAL IMPLICATIONS

The findings of this study provide valuable insights with practical implications for various stakeholders. Investors, faced with the volatile nature of cryptocurrencies, can consider a diversified approach, taking into account the varying dynamics of Bitcoin, Ethereum, and Litecoin. The observed co-movements between cryptocurrencies and green energy indexes suggest potential opportunities for strategic hedging, offering a nuanced perspective for those navigating economic uncertainties.

For sustainable investment enthusiasts, the positive movements in the Clean Energy Fuels index make it a noteworthy option, emphasizing the potential for aligning financial goals with environmental responsibility. Policymakers can find encouragement in the perceived stabilization of the green energy sector, as indicated by reduced volatility in 2022. This may guide more informed decisions in the pursuit of sustainable and resilient energy solutions.

In essence, beyond contributing to academic discussions, this study offers practical guidance. As we face a future where financial and environmental considerations are increasingly interconnected, a nuanced understanding of these markets becomes not just an academic pursuit but a pragmatic necessity.

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From Crisis to Connectivity: Unraveling Sustainable Energy Indexes

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Abstract: *The pursuit of financing instruments aligned with the Sustainable Development Goals (SDGs) is crucial for fostering sustainability in diverse economic sectors. However, a significant gap exists in understanding the performance of green assets, posing challenges for investors and policymakers. This study addresses this gap by examining the relationships among green energy indexes, including ISE Clean Edge Global Wind Energy, S&P Global Clean Energy, S&P TSX Renewable Energy and Clean Technology, and Solactive China Clean Energy, from January 2020 to October 2023. Findings reveal that ISE Clean Edge and S&P Global Clean Energy indexes serve as hedging assets, while S&P TSX provides coverage against specific risks. The Solactive China Clean Energy index, however, may not be suitable for hedging due to strong peer connectivity and a lack of long-term stability. In conclusion, effective alignment of sustainability goals with clean energy investment strategies requires careful consideration of asset characteristics and relationships, emphasizing diversification, and ongoing awareness of evolving dynamics for socially and environmentally responsible investors.*

1. INTRODUCTION

Energy is the lifeblood of modern society and crucial for societal well-being. However, historical methods of obtaining and using energy have raised significant concerns. Primary energy sources like fossil fuels (coal, oil, and natural gas) are finite resources. As our population grows and economies expand, the appetite for energy increases, leading not only to scarcity but also significant environmental issues. Sustainable energy development is pivotal, not just for environmental protection but also as a crucial driver of economic growth and social progress. It opens avenues for innovation, job creation, and energy independence, enhancing energy security by reducing dependence on foreign sources (Dias, Alexandre, et al., 2023; Dias, Horta, et al., 2023).

The rise of the green economy signifies a profound and promising shift toward sustainable development. This innovative approach seeks to harmonize economic growth, ecological conservation, and social well-being, creating a holistic and balanced system. It acknowledges the interconnectedness of these three elements, recognizing that one cannot thrive at the expense of the others. This transformation is not occurring in isolation; it is gaining attention and support from a broad spectrum of stakeholders. Investors, acknowledging the long-term viability of sustainable practices, are directing their resources toward environmentally responsible companies and technologies. Policymakers and government officials are also taking note of the potential of the green economy. They are formulating regulations and incentives to encourage businesses

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and individuals to adopt sustainable practices. This support is crucial for steering economies toward a future that is more environmentally conscious (Wang et al., 2021).

This study investigates the long-term relationships among green energies, such as the ISE Clean Edge Global Wind Energy, S&P Global Clean Energy, S&P TSX Renewable Energy and Clean Technology, Solactive China Clean Energy, from January 2020 to October 2023. Despite a substantial body of research analyzing separately the financial implications of the Covid-19 pandemic and the Russian invasion of Ukraine in 2022, there is a shortage of studies exploring the long-term relationship between these two events and the performance of green stock indexes. Green stock indexes, often comprised of companies engaged in environmentally sustainable practices, have garnered increasing attention in recent years due to growing concerns about climate change and sustainable investment. Understanding the performance of these indexes during a period marked by public health crises and geopolitical tensions can provide valuable insights into the resilience and potential of green investments. This study aims to fill this gap by examining the dynamics of green stock indexes from 2020 to 2023 and beyond. Through this analysis, we can gain a better understanding of how sustainable investments respond to economic crises, international conflicts, and shifts in investor sentiment. Furthermore, this study may shed light on broader trends in Environmental, Social, and Governance (ESG) investment and the extent to which sustainability factors are now integrated into financial markets.

The remainder of this article is structured as follows: Section 2 conducts a literature review, while Section 3 outlines the methodologies and data employed in this study. Section 4 comprehensively presents empirical findings and engages in a discussion thereof. Finally, Section 5 encapsulates the study's conclusions and delineates the ensuing political implications. This organizational framework ensures a systematic and cohesive presentation, guiding readers through the critical components of the research process, from the theoretical underpinnings to the practical outcomes and their broader implications for policy considerations.

2. LITERATURE REVIEW

The years 2020 and 2022 witnessed a unique confluence of global events, from the devastating COVID-19 pandemic to the disruptive Russian invasion of Ukraine. These crises not only had profound and immediate impacts worldwide but also raised questions about the long-term consequences for various aspects of society, including financial markets.

Authors Pham and Nguyen (2021) and Attarzadeh and Balcilar (2022) examined the dependence between green bonds and other asset classes, including energy markets, stock markets, and conventional bonds. In their study, Pham and Nguyen (2021) reveal that the repercussions between asset classes and green bonds vary widely across quantiles, indicating that the hedging benefits of green bonds against conventional asset classes differ. On the other hand, authors Attarzadeh and Balcilar (2022) found that clean energy and traditional stock markets transmit shocks to bitcoin and oil, and they receive shocks from bitcoin and oil as well. Additionally, bitcoin and other financial markets are only loosely connected during non-crisis periods. However, their connection substantially strengthens in times of crisis, such as the major cryptocurrency crisis of 2018 and the COVID-19 pandemic of 2020.

The authors Urom (2023), and Iuga et al. (2023) analyzed the dynamic dependence and connection between investments in financial technology (FinTech), green assets, and traditional assets under

different market conditions and investment horizons. In his study, [Urom \(2023\)](#) demonstrates that the joint movement between FinTech and green bonds and clean energy stocks is predominantly positive and stronger in the long term but weak in the short term, indicating a high probability of significant joint losses for long-term investors and hedging opportunities for FinTech stocks for short-term investors in green financial assets. [Iuga et al. \(2023\)](#) show that the pandemic not only increases financial market volatility but also has a significant long-term impact on the structural behavior of daily returns. The analysis also reveals differences in the co-movement of financial returns between the two periods. However, on a positive note, the pandemic paves the way for a few financial assets to dominate the market, especially those recognized as safe haven assets.

Researchers like [Dias, Alexandre, et al. \(2023\)](#), [Karim et al. \(2023\)](#), and [Dias, Teixeira, et al. \(2023\)](#) looked into what effects the events of 2020 and 2022 might have on the volatility of clean energy indexes, dirty energy indexes, and cryptocurrencies that are considered “dirty” because they use a lot of electricity. In their research, [Dias, Alexandre, et al. \(2023\)](#) show that clean energy stock indexes can offer a viable safe haven for dirty energy cryptocurrencies. However, the precise associations differ depending on the cryptocurrency under analysis. [Karim et al. \(2023\)](#) suggest that green bonds offer sufficient diversification, a safe refuge, and hedging opportunities during stable and challenging times for financial markets, highlighting that sustainable assets exhibit significant dissociation. While, in their study, [Dias, Alexandre, et al. \(2023\)](#) demonstrate that clean and dirty energy indexes do not exhibit hedging characteristics nor serve as safe havens in times of economic uncertainty.

In summary, studying the long-term connectivity of clean energy industries during the 2020 pandemic and the events of 2022 is vital for understanding resilience, economic relevance, and the potential implications of clean energy investments. Clean energy is often regarded as a vital component of sustainability and the response to climate change. Evaluating its resilience during turbulent times can provide insights into the industry’s ability to withstand shocks, maintain growth trajectories, and potentially contribute to economic stability.

3. METHODOLOGY

3.1. Data

The data used in this study comprises the price indexes of green energy stocks, including the ISE Clean Edge Global Wind Energy, S&P Global Clean Energy, S&P TSX Renewable Energy and Clean Technology, Solactive China Clean Energy, spanning from January 2020 to October 2023. The data was sourced from the Thomson Reuters Eikon database. All prices considered in this study are quoted in the local currency to alleviate currency-related distortions, thereby ensuring a consistent comparison across the various indexes. This methodological choice enhances the reliability of the analysis by preventing confounding effects associated with currency fluctuations and supports the robustness of the findings in the assessment of the performance of green energy indexes during the specified timeframe.

3.2. Methods

This research unfolds through distinct stages. In the initial phase, for sample characterization, we will employ key descriptive statistical measures and the [Jarque and Bera \(1980\)](#) adherence test, which assumes data normality. To validate the stationarity assumption of the time series, we will

employ the panel unit root test by [Levin et al. \(2002\)](#), a statistical test in econometrics used to assess whether time series data collected from multiple cross-sectional units have a unit root. This test aids in identifying the most significant crash and the year of its occurrence. To examine long-term connectivities, we will employ the methodology proposed by [Gregory and Hansen \(1996\)](#). This test is commonly applied in the context of unit root tests and the analysis of long-term linkages. In practical terms, this methodology relies on the likelihood ratio. The test statistic follows a specific distribution, typically a chi-square distribution, under the null hypothesis.

4. EMPIRICAL RESULTS AND DISCUSSION

Figure 1 depicts the evolution of returns for green energies such as ISE Clean Edge Global Wind Energy, S&P Global Clean Energy, S&P TSX Renewable Energy and Clean Technology, Solactive China Clean Energy, from January 2020 to October 2023. Concerning sustainable energies, a notable volatility spike was observed from the early months of 2020, intensifying further in 2021. In the year 2022, there is a relative decrease in volatility, which we attribute to the notion that clean energy systems are less susceptible to geopolitical turbulence.

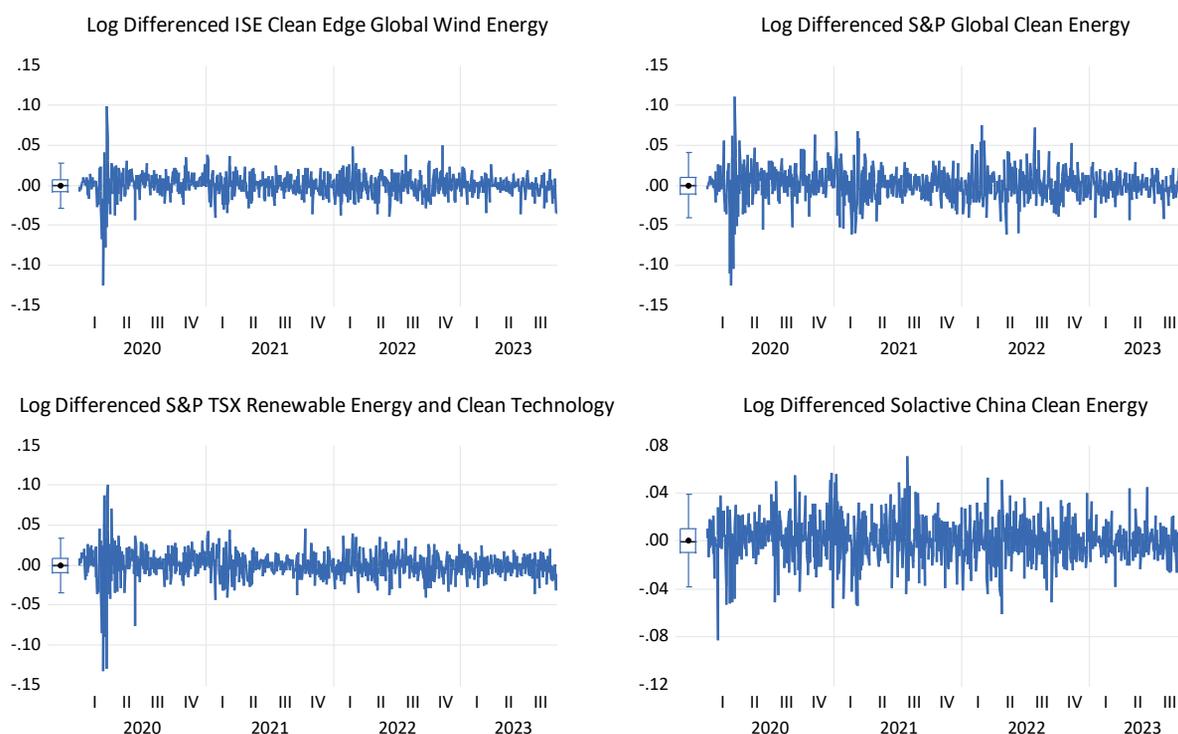


Figure 1. Evolution, in returns, of sustainable energy stock indexes, from January 2020 to October 2023

Source: Own elaboration (software: Eviews12)

Table 1 presents relevant statistics for the stock indexes ISE Clean Edge Global Wind Energy, S&P Global Clean Energy, S&P TSX Renewable Energy and Clean Technology, Solactive China Clean Energy, from January 2020 to October 2023. Regarding mean returns, ISE Clean Edge Global Wind Energy and S&P TSX Renewable exhibit negative mean values ($-7.41E-05$ and -0.000391 , respectively), while the others show positive averages. S&P Global (0.020064) displays the most pronounced standard deviation, suggesting a higher risk propensity compared to its peers. In terms of skewness, all indexes exhibit negative values different from 0 (the reference value), while kurtosis values differ from 3, with the S&P TSX index (13.55373) having

the most significant value. Finally, the [Jarque and Bera \(1980\)](#) adherence test rejects the null hypothesis at a 1% significance level, validating the results of skewness and kurtosis, indicating non-Gaussian distributions.

Table 1. Summary table of key statistics, in returns, concerning sustainable energy stock indexes, from January 2020 to October 2023

	ISE CLEAN	S&P GLOBAL	S&P TSX	SOLACTIVE
Mean	-7.41E-05	0.000228	-0.000391	0.000517
Std. Dev.	0.014401	0.020064	0.017327	0.017442
Skewness	-0.660691	-0.380926	-0.846904	-0.097354
Kurtosis	12.64018	8.237000	13.55373	4.533476
Jarque-Bera	3862.119	1142.436	4660.460	97.47009
Probability	0.000000	0.000000	0.000000	0.000000
Observations	979	979	979	979

Source: Own elaboration (software: Eviews12)

To validate the stationarity assumption for the time series data of sustainable energies, including ISE Clean Edge Global Wind Energy, S&P Global Clean Energy, S&P TSX Renewable Energy and Clean Technology, Solactive China Clean Energy, spanning from January 2020 to October 2023, we employed the panel unit root test proposed by [Levin et al. \(2002\)](#). The results revealed that closing prices exhibited unit roots. To address this, a logarithmic transformation on first differences (returns) was applied. Following this transformation of the original data, we re-estimated the panel stationarity test, confirming the elimination of unit roots and achieving a smoother time series (see [Table 2](#)).

Table 2. Panel unit root test, regarding sustainable energy data series, from January 2020 to October 2023

Null Hypothesis: Unit root (common unit root process)							
Method Levin, Lin & Chu t				Statistic		Prob.*	
				-95.5546		0.0000	
Series	2 nd Stage Coefficient	Variance of Reg	HAC of Dep.	Lag	Max Lag	Bandwidth	Obs.
ISE CLEAN	-0.84283	9.0800	0.2944	0	21	64.0	977
S&P GLOBAL	-0.84777	1082.0	28.858	0	21	76.0	977
S&P TSX	-0.88842	9.3615	0.3077	1	21	62.0	976
SOLACTIVE	-1.01242	1557.5	12.826	0	21	246.0	977
	Coefficient	t-Stat	SE Reg	mu	sig		Obs.
Pooled	-0.89848	-52.858	1.002	-0.500	0.500		3907

Note: *Probabilities are computed assuming asymptotic normality

Source: Own elaboration

[Table 3](#) presents the results of the [Gregory and Hansen \(1996\)](#) test regarding long-term connections applied to sustainable energy indexes, such as ISE Clean Edge Global Wind Energy, S&P Global Clean Energy, S&P TSX Renewable Energy and Clean Technology, Solactive China Clean Energy, spanning from January 2020 to October 2023.

Upon analyzing the sustainable energy indexes, we observe that ISE Clean Edge and S&P Global Clean Energy can be considered long-term hedging assets for their peers, exhibiting a significant dissociation from them. S&P TSX appears to provide substantial coverage for ISE Clean Edge and S&P Global Clean Energy. However, there is a notable connection with the Chinese index (Solactive China Clean Energy), indicating that it might not be a suitable hedging asset.

Solactive China Clean Energy shows long-term shocks with its peers, suggesting it lacks hedging properties. In summary, the practical implications for investors are that they have the option to use ISE Clean Edge and S&P Global Clean Energy indexes for long-term hedging and S&P TSX for coverage against specific risks. However, Solactive China Clean Energy might not be a suitable choice for hedging due to its strong connectivity with peers and a lack of long-term stability.

Table 3. Summary table of long-term shocks among sustainable energies, from January 2020 to October 2023

Market	t-stat	Results
ISE Clean S&P Global Clean	-3.72	Nonexistent
ISE Clean S&P TRX Clean	-3.64	Nonexistent
ISE Clean Solactive China Clean	-4.34	Nonexistent
Market	t-stat	Results
S&P Global Clean ISE Clean	-3.39	Nonexistent
S&P Global Clean S&P TRX Clean	-4.26	Nonexistent
S&P Global Clean Solactive China Clean	-5.21**	Shock L/ Time
Market	t-stat	Results
S&P TRX Clean ISE Clean	-3.81	Nonexistent
S&P TRX Clean S&P Global Clean	-4.68	Nonexistent
S&P TRX Clean Solactive China Clean	-5.27**	Shock L/ Time
Market	t-stat	Results
Solactive China Clean ISE Clean	-4.79*	Shock L/ Time
Solactive China Clean S&P Global Clean	-5.57***	Shock L/ Time
Solactive China Clean S&P TRX Clean	-5.52***	Shock L/ Time

Note: ***, **, * significant at 1%, 5%, and 10%, respectively

Source: Own elaboration (software: STATA15.1)

5. FUTURE RESEARCH DIRECTIONS

Building on the extensive insights gained from the analysis of green energy indexes, future research directions in this domain could explore several avenues to deepen our understanding and contribute to sustainable finance. Firstly, investigating the evolving dynamics of these indexes in response to emerging global challenges, such as new pandemics, geopolitical tensions, or technological advancements, could provide valuable foresight for investors. Additionally, delving into the impact of regulatory changes and policy shifts on the performance of green energy indexes would enhance our comprehension of the interplay between market forces and government interventions. Furthermore, a more granular examination of the underlying components of these indexes, considering individual companies or specific technologies, could uncover nuanced patterns and opportunities for investors. Exploring the integration of environmental, social, and governance (ESG) factors in the construction and performance of green energy indexes would align with the growing emphasis on responsible investing. Lastly, conducting cross-sectional analyses comparing the performance of green energy indexes with traditional indexes during various economic conditions could offer insights into the resilience and risk-adjusted returns of sustainable investments. These future research directions aim to contribute to the ongoing discourse on sustainable finance and provide practical guidance for investors navigating the complexities of the evolving energy landscape.

6. CONCLUSION

This study delved into the intricate dynamics of long and short-term relationships within green energy indexes, encompassing ISE Clean Edge Global Wind Energy, S&P Global Clean Energy, S&P TSX Renewable Energy and Clean Technology, and Solactive China Clean Energy, spanning from January 2020 to October 2023. In summary, investors possess a spectrum of choices to navigate and mitigate risks in their portfolios when leveraging sustainable energy indexes. The ISE Clean Edge and S&P Global Clean Energy indexes emerge as potent tools for long-term hedging, while the S&P TSX index proves effective in providing coverage against specific risks. Nevertheless, caution is advised concerning the Solactive China Clean Energy index, which, given its robust interconnectivity with peers and a dearth of long-term stability, does not emerge as a recommended hedging asset. These insights are instrumental in shaping investment strategies within the sustainable energy sector, empowering investors to make judicious, risk-aware decisions.

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Tax System in Bosnia and Herzegovina

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Abstract: *The paper deals with taxes and the tax system in Bosnia and Herzegovina. Modern tax systems are based on taxation of income and consumption. For developing countries like Bosnia and Herzegovina, the taxation of consumption is more dominant than the taxation of income. This means that in such countries the participation of indirect taxes concerning direct taxes is higher. The basic taxation categories in Bosnia and Herzegovina are corporate income tax, personal income tax, value-added tax, social security contributions, and excises. The taxation system in Bosnia and Herzegovina is characterized by low tax rates. Personal income tax is paid at the rate of 10% which means that we have proportional tax rates. But social security rates are high as follows (employee's share): 17% for pension insurance, 12,5% for health insurance and 1,5% for health insurance. We need some fiscal reforms within fiscal policy if we want to have higher salaries and standard of living.*

1. INTRODUCTION

The decentralized structure of the fiscal system of Bosnia and Herzegovina was established to facilitate state-building by promoting political stability and democratic representation in the decision-making process.

Modern tax systems are based on taxation of income and consumption. For developing countries like Bosnia and Herzegovina, the taxation of consumption is more dominant than the taxation of income. This means that in such countries the participation of indirect taxes concerning direct taxes is higher.

The tax system is largely inconsistent with the single economic space, and entrepreneurs, in inter-entity trade, face situations similar to those they would encounter when trading between different countries (double taxation, double administrative charges, etc.).

2. LITERATURE REVIEW

According to Hayes (2023), „Fiscal policy refers to the use of government spending and tax policies to influence economic conditions. During a recession, the government may lower tax rates or increase spending to encourage demand and spur economic activity. Conversely, to combat inflation, it may raise rates or cut spending to cool down the economy.“

Horton and El-Ganainy (n.d.) found that „fiscal policy influences the economy through government spending and taxation, typically to promote strong and sustainable growth and reduce poverty.“

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„Effective fiscal policy implies building a political and institutional framework for sound fiscal management. The lack of political and institutional infrastructure complicates the development of a fiscal framework that would be sustainable for a long time.“ (Čolaković-Prguda, 2013)

According to Antić (2013), „Complexity of government levels, a high degree of decentralization of responsibilities for revenues and expenditures, a weak central government and the asymmetry in the structure of the Entity government are the main features of the fiscal system in Bosnia and Herzegovina.“

Matthews (2011) found, „in open economies, where capital is mobile across boundaries and where multinational enterprises are very important in international trade and investment, tax regimes and tax rates can potentially have a significant influence on decisions about the location of production and investment.“

„Tax is a ‘financial charge’. It might be a deduction from (or an amount you have to pay out of) something you get or own, or an additional cost added to something you buy.“ Low Incomes (Low Incomes Tax Reform Group, n.d.).

The tax system in Bosnia and Herzegovina is quite complicated because Bosnia and Herzegovina consists of two entities (the Federation of Bosnia and Herzegovina and the Republic of Srpska) and Brčko Distrikt. Federation has ten cantons which also makes some difficulties. However, indirect taxes are regulated on the state level and they include value-added tax, excise and customs. The most important and the most generous tax is VAT, but we mustn't forget the importance of other types of indirect taxes.

The Indirect Taxation Authority of Bosnia and Herzegovina (ITA BiH) is responsible for indirect taxation policy, collecting and allocating indirect tax revenues.

3. TAXES IN BOSNIA AND HERZEGOVINA

3.1. Structure of Direct and Indirect Taxes

The basic taxation categories in Bosnia and Herzegovina are:

- Corporate income tax,
- Personal income tax,
- Value Added Tax,
- Social Security contributions,
- Excises (this is a special type of sales tax paid on some commodities like oil products, tobacco products, soft drinks, alcohol drinks, beer, wine and coffee and it often changes).

In the table below we can see rates of some taxation categories in Bosnia and Herzegovina. These types of taxes are very important, especially value-added tax because it brings a lot of money to the Indirect Taxation Authority which is in charge of collecting value-added tax. VAT has a unique rate for all types of goods and it's the same in both entities and Brcko District.

It would be better for our economic policy and economic growth to create different VAT rates, to make a difference between necessary and luxury goods. Personal income tax has also one rate and it would be better to apply progressive tax rates.

Table 1. Rates of some taxation categories in Bosnia and Herzegovina (FB&H, RS, BD)

Categories	Tax rate
Corporate Income Tax	10%
Personal Income Tax	10%
Value added tax	17%

Source: Foreign Investment Promotion Agency of Bosnia and Herzegovina (FIPA), 2016

3.2. Corporate Income Tax Rate

At the beginning of this part, we can say that the taxation system of Bosnia and Herzegovina has quite low tax rates, especially if compared to some countries from the region or European Union. The corporate income tax rate is unique and it is 10% for both entities and Brcko Distrikt.

Profits are calculated following applicable laws, by deducting (real) expenses from revenues. Profits transferred from abroad are not taxed if they were previously subject to taxation abroad. The tax base includes profit gained through revenues and capital gains, according to the accounting regulations.

In the Federation of Bosnia and Herzegovina, a taxpayer is a resident of the Federation of Bosnia and Herzegovina, making a profit on the territory of the Federation and abroad, and a non-resident making a profit on the territory of the Federation.

All foreigners, who have permanent residence in one of the entities, are obliged to pay personal income tax on revenues earned within the calendar year in Bosnia and Herzegovina. Foreigners who do not reside permanently in Bosnia and Herzegovina but earn income within entities are considered taxpayers. In the Brcko District, foreigners are treated as taxpayers if they stay there for 183 days at least, without interruptions (Foreign Investment Promotion Agency of Bosnia and Herzegovina (FIPA), 2016).

Table 2. Comparable review of corporate income tax rates in the region

Bosnia and Herzegovina	10 %	Slovakia	23 %
Serbia	15 %	Czech Republic	19 %
Romania	16 %	Poland	19 %
Slovenia	19 %	Croatia	20 %

Source: Foreign Investment Promotion Agency of Bosnia and Herzegovina (FIPA), 2016

We can see some comparison between Bosnia and Herzegovina and some countries of Central and East Europe countries as shown in the table above. It can be noticed that we have the lowest corporate income tax rate and it should be changed in the near future.

Bosnia and Herzegovina has signed Agreements on the avoidance of double taxation with many countries, not only from Europe. Some of them are: Montenegro, Denmark, Egypt, Finland, France, Greece, Germany, Croatia, Holland, Iran, Ireland, Italy, Jordan, Kuwait, Qatar, China, Cyprus, Hungary, Malaysia, Macedonia, Moldova, Norway, Pakistan, Poland, Romania, Slovakia, Slovenia, Serbia, Spain, Sweden, Sri Lanka, Turkey, etc.

3.3. Personal Income Tax Rate

In Bosnia and Herzegovina, the Personal Income Tax Rate is a tax collected from individuals and is imposed on different sources of income like labour, pensions, interest and dividends.

Revenues from the Personal Income Tax Rate are an important source of income for the government of Bosnia and Herzegovina (Trading Economics, n.d.).

„Taxpayer is a resident of Federation of Bosnia and Herzegovina and non-resident as follows:

- resident making income in a territory of Federation and outside of its territory;
- a non-resident performing an activity within the territory of the Federation;
- a non-resident who performs independent activity in the territory of the Federation of Bosnia and Herzegovina
- a non-resident who receives income in the territory of the Federation of Bosnia and Herzegovina from property, copyrights, patents, licenses, investment of capital or some other activity.“ (Foreign Investment Promotion Agency of Bosnia and Herzegovina (FIPA), 2016)

Resident is an individual who has permanent residence in the Federation of Bosnia and Herzegovina; spends at least 183 days in the Federation during any tax period; or has permanent residence in the Federation and earns income by carrying out a dependent activity outside the Federation.

In the table below we can see the comparison between Bosnia and Herzegovina and some countries from the region.

Table 3. Comparable review of personal income tax rates in the region

Bosnia and Herzegovina	10 %	Slovakia	25 %
Serbia	20 %	Czech Republic	15 and 23 %
Romania	10 %	Albania	23 %
Poland	32 %	Croatia	25-35,40 %

Source: PricewaterhouseCoopers, n.d.

In the Federation of Bosnia and Herzegovina and the Republic of Srpska, personal income tax rate is 10% (net salary).

It can be concluded that some countries, like Bosnia and Herzegovina, have proportional tax rates and some of them have progressive ones which is probably better for economic growth and development.

In the next table, we can see the basic personal exemption of the taxpayer in Bosnia and Herzegovina.

Table 4. EXEMPTIONS / DEDUCTIONS personal deductions

basic personal exemption of the taxpayer	150,00 EUR
for dependant spouses	75,00 EUR
for first child	150,00 EUR
for second child	105,00 EUR
for third dependent child and any further dependent child	135,00 EUR
for each other dependent members of the close family	45,00 EUR
for its own disability and invalidity of any member of the close family supported by taxpayer.	45,00 EUR

Source: Foreign Investment Promotion Agency of Bosnia and Herzegovina (FIPA), 2016

3.4. Value Added Tax

The unique VAT rate in Bosnia and Herzegovina is 17%. Indirect Taxation Authority is in charge of collecting value-added tax and coordinating fiscal policy issues in general. ITA is also responsible for collecting customs and excise and this is a very important part of fiscal policy and represents a significant amount for the national budget. It is an autonomous organization responsible to the Council of Ministers of Bosnia and Herzegovina. The council appoints the Director of the Indirect Taxation Authority.

There are four regional centers (Sarajevo, Banja Luka, Mostar and Tuzla), then 30 customs sub-offices and 59 customs posts.

Value added tax is a general tax applied to all commercial activities (including manufacturing and distribution of goods and providing services). It is a consumer tax because it's paid by the end user, not by the enterprise. VAT is a comprehensive consumption tax, assessed based on the value added to goods and services. The tax amount is visible in all stages and this ensures neutrality of taxation, regardless of the number of transactions involved. Benefits related to the value-added tax are regulated by the Law on Value Added Tax and its implementing regulations for the Value Added Tax and the Law on Free Zones of Bosnia and Herzegovina and the Law on Customs Policy of Bosnia and Herzegovina. Bosnia and Herzegovina has one of the lowest rates of VAT, in the region and widely. This confirms the following table.

Table 5. Comparable review of VAT rates in the region

Bosnia and Herzegovina	17 %	Slovakia	20 %
Hungary	27 %	Czech Republic	21 %
Romania	19 %	Poland	23 %
Slovenia	22 %	Croatia	25 %

Source: Tax Foundation., n.d.

In Table 3 we can see some VAT rates in Europe and make some comparisons and conclusions. The highest VAT rate is in Hungary but very high rates also have Croatia, Denmark and Sweden. Interestingly, the same rates have Germany and Romania, and Luxemburg have the lowest rate.

Table 6. VAT rates in Europe



Source: Hellotax, n.d.

Certain transactions are exempt from value-added tax (VAT), and there will be mentioned some of them: public postal services, except telecommunications services; medical and healthcare services; social security services; services of education; services in the field of sport and sports education, insurance and reinsurance services; etc. (Lloyds Bank, n.d.).

3.5. Excise Tax Rate

Excise taxes are special taxes imposed on certain goods (oil products, tobacco products, soft drinks, alcohol drinks, beer, wine and coffee), services, and activities. The taxpayer shall be the legal person and entrepreneur that imports or exports the excise products in the territory of Bosnia and Herzegovina.

The excise is paid in the absolute amount per unit of measure or at a proportional rate as follows in the next table.

Table 7. Excise tax rates

Product	Excise tax rate
oil products (per litre)	BAM 0.30
non-alcoholic drinks (per litre)	BAM 0.10
soft drink (per litre)	beer BAM 0.20 and wine BAM 0.25
alcoholic drinks and ethyl alcohol (per litre)	BAM 15
raw coffee (per kilo)	BAM 1.50

Source: Foreign Investment Promotion Agency of Bosnia and Herzegovina (FIPA), 2016

We can say that excises are a very important group of indirect taxes and they bring a lot of money to the national budget, and that amount is higher each year. It is because of higher excise tax rates and higher consumption.

3.6. Social Security Contributions in the Federation of Bosnia and Herzegovina

Social security contributions payers in the Federation of Bosnia and Herzegovina are legal or natural persons - residents of the Federation of Bosnia and Herzegovina. (for more information you can see Foreign Investment Promotion Agency of Bosnia and Herzegovina (FIPA), 2016). In the table below it can be seen very high levels of social security rates (employee's and employer's share).

Table 8. Social Security rates

Employee's share	Employer's share
17% for pension insurance	6% for pension insurance
12,5% for health insurance	4% for health insurance
1,5% for unemployment insurance	0,5% for unemployment insurance

Source: Foreign Investment Promotion Agency of Bosnia and Herzegovina (FIPA), 2016

The cumulative rate of the contributions is currently 41.5 percent and is among the highest in the region, with no intention of visibly reducing it, which will initiate several processes that can lead to an increase in the standard of living of a large number of workers in the Federation, relieving for employers and ultimately creating conditions for opening new working places and creating a better climate for investing.

4. CONCLUSION

Here are some recommendations for creators of economic policy that can make visible changes within the economy of Bosnia and Herzegovina, especially if there is political support and will to make things better and more efficient.

- Preferential VAT rates for some goods and services. We have a unique VAT rate for all goods and services and it's 17%. Rates should be lower for necessary goods and higher for luxury ones.
- Food and drink for human consumption should be zero-rated. The average net salary in Bosnia and Herzegovina is about 650 euros and that's why it would be better to have some types of food and drink zero rated.
- Progressive taxation – higher tax rates for those who earn more (higher income). We have a unique personal income tax rate and it is 10%. A progressive type of taxation would bring more money for the national budget and socially vulnerable groups.
- Social security rates should be lower (very high level, 41 percent). There are some incentives for changes in social security rates because they are high but government and employees can't still find the best solution for everyone.
- According to fiscal policy and laws and government announcements, the social security rate will be 28 percent. If we are going to have a social security rate of 28% then we can talk about higher consumption, higher GDP, and production.
- A wage increase can be expected. We can expect higher average wages in the near future and minimum wages also. We have a pretty high inflation rate and wage increases can ease some consequences of inflation.

Fiscal policy and tax system require some visible reforms that will bring higher consumption and production, higher employment rate, and lower social security contributions. That will increase the economic growth rate and standard of living in Bosnia and Herzegovina.

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Micro-Level Insights into the Impact of R&D Tax Credits on Firm Behavior in the Portuguese Services Industry

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Abstract: *This research explores the impact of R&D tax credits on the distribution of full-time equivalent staff in 2838 firms in the services industry that engaged in R&D activities in Portugal between 1995 and 2017. In contrast to aggregate or sectoral approaches, the analysis relies on comprehensive firm-level data. Utilizing the official business R&D survey database, variables such as the full-time equivalent staff, PhD holders, and R&D expenditure are examined. Employing a Difference-in-Differences with an event study and a staggered design for temporal analysis, the impact of introducing a tax incentive scheme for corporate R&D in the services industry is evaluated. Results reveal a positive effect of the tax credit, with varying average impacts based on the duration of exposure per firm. These findings mirror similar positive outcomes observed in France in 2004 and 2005, where firms benefiting from the Jeune Entreprise Innovante scheme exhibited higher annual employment growth. The study contributes to understanding the effectiveness of R&D tax credits in shaping the distribution of the full-time equivalent staff in services firms and provides insights into potential policy implications.*

1. INTRODUCTION

This study examines the impact of R&D tax credits on the allocation of full-time equivalent (FTE) staff in Portuguese firms engaged in R&D activities within the services industry over a twenty-three-year period from 1995 to 2017. The analysis builds upon recent research indicating a significant effect of R&D tax credits on the allocation of Ph.D. holders in medium-high and high R&D intensity (Industry's business R&D expenditure divided by gross value added) firms (Paredes et al., 2022).

The research contributes to the literature as it uses extensive data for a considerable period, allowing the evaluation of the effects of a concrete political instrument aimed at firms that performed R&D activities, not at an aggregate or sectoral level, but at the firm level. A key advantage of studying the impact of R&D tax credits at a firm level is that it allows capturing much more variation in R&D tax subsidy rates than is possible at a more aggregate level of data (Bogliacino & Vivarelli, 2012).

The attraction of skilled human resources is a central component of strategies to promote R&D activities within firms. Countries have employed various policy instruments, including R&D tax incentives, to stimulate engagement in R&D activities, as observed in the European Union and OECD countries (Appelt et al., 2016).

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Focusing on the services industry, the research addresses the question: Does the R&D tax credit impact the allocation of FTE staff within the services industry? To address this question, a database covering 2838 firms from the services industry that performed R&D at least once in Portugal over the twenty-three-year period 1995 to 2017 is used, provided by the official business R&D survey data and a database of firms that applied for tax credit incentives at least once in the same period.

Using Difference-in-Differences with an event study, specifically employing a staggered design for detailed temporal analysis (Callaway & Sant'Anna 2021; Roth et al., 2023), the impact of SIFIDE (Tax incentive scheme for corporate R&D) within the services industry is assessed. Findings suggest a positive effect of the tax credit, with the average impact varying by the length of exposure per firm. These results align with similar findings observed in France in 2004 and 2005, where firms benefiting from the *Jeune Entreprise Innovante* scheme exhibited higher annual employment growth.

The remaining sections of this paper are organized as follows: the tax incentives scheme for R&D in Portugal is presented in section 2. Section 3 presents the data source and methodology used to assess the impact of R&D tax incentives on the full-time equivalent staff. The main findings are presented and discussed in section 4, and the conclusion is drawn in section 5, suggesting the relevance of the findings for future research in this domain.

2. TAX INCENTIVES SCHEME FOR R&D IN PORTUGAL

The SIFIDE aims to enhance companies' competitiveness by supporting their efforts in R&D through the deduction of R&D expenses from the Corporate Income Tax. The SIFIDE was introduced in 1997 as a measure to stimulate the participation of the business sector in the global R&D endeavour. Over time, the incentive scheme has undergone several revisions to make it even more attractive for companies engaged in R&D.

The enactment of SIFIDE II (State Budget Law for 2011 (Law No. 55-A/2010, dated December 31), subsequently amended by Law 83-C/2013 on December 31) in 2011, replacing the original SIFIDE, had as the primary objective remains to bolster the competitiveness of businesses by supporting their R&D endeavours. Under this incentive framework, eligible expenses encompass both research and development expenditures. Research expenses include those incurred by the taxpayer to acquire new scientific or technical knowledge. Development expenses, on the other hand, involve activities by the taxpayer exploiting the results of research or other scientific and technical knowledge, aiming at significant improvements in raw materials, products, services, or manufacturing processes.

Several types of eligible expenses further enhance the appeal of the incentive scheme (OECD, 2023). These include expenses related to contracting R&D activities from public entities or entities with recognized status in R&D. Additionally, expenses for acquiring patents predominantly dedicated to R&D activities (limited to SMEs) and personnel expenses for individuals with a minimum educational qualification of level 8 (PhD) are considered at 120% of their amount.

One of the key features of the SIFIDE II scheme is the support it provides to beneficiaries, enabling them to recover up to 82.5% of their R&D investment. This support includes a base deduction rate of 32.5% for the total R&D expenditure in the current year. Additionally, a 50%

incremental rate is applied to the increase in expenses compared to the average of the two previous years (capped at 1.5 million euros). For SMEs subject to Corporate Income Tax, which has not completed two fiscal years and has not benefited from the incremental rate, a 15% uplift is applied to the base rate, resulting in a 47.5% deduction. The multifaceted nature of the SIFIDE II incentive scheme underscores its importance in fostering a conducive environment for R&D activities among Portuguese businesses.

3. DATA AND METHODOLOGY

3.1. Data Source

For this analysis, a database covering 2838 firms from the official business R&D survey (Follows the Eurostat and OECD methodological guidelines and the definitions of the Frascati Manual) data was used from 1995 to 2017. The R&D Survey is compulsory for all firms that potentially perform R&D activities. The information collected focuses on resources (financial and human) related to R&D activities. Data on R&D tax incentives were gathered through administrative data.

For this analysis, two datasets were merged using firms' fiscal numbers as the primary key. From the first dataset, the variables selected were at the human resources level, total R&D personnel, total personnel in FTE (PFTEI), and number of PhD holders. Regarding R&D expenditure, the following variables were used: current R&D expenditure, capital R&D expenditure, and internal funds.

From the second dataset, a dummy variable was created to identify firms that utilized tax credits. This binary variable takes 1 if a firm utilized tax incentives and 0 otherwise. The merging process aimed to combine these datasets seamlessly, providing a comprehensive set of variables for the subsequent analysis.

3.2. Methodology

In this study, the authors used a Difference-in-Differences (DiD) model to assess the impact of an R&D tax credit on firms engaged in R&D activities. It used a database covering 2838 firms performing R&D activities from the services industry over 23 years.

The DiD model is typically applied when at least two time periods are available, which is the case. During the abovementioned period, the tax incentive scheme had an interruption of two years (the R&D tax credit was not applied in 2004 and 2005 for political reasons). DiD model involves a treated group receiving treatment and a comparison group not receiving treatment in either period. The fundamental assumption of the canonical DiD is that both groups would follow "parallel trends" over time in the absence of treatment.

Regarding the extensions, the DiD model allows for multiple variations in treatment timing and consideration of violations of parallel trends (see [Abadie \(2005\)](#) for further discussion). There is a focus on extending the model to settings with staggered treatment adoption, where treatment occurs at different times for different groups.

Concerning the staggered treatment adoption, extending the parallel trends assumption to staggered settings requires ensuring that parallel trends hold for all combinations of periods and groups treated at different times.

New estimators can be used as an alternative to better aggregate treatment effects in staggered treatment scenarios. These estimators help handle situations with many treated periods and cohorts, allowing for weighted averages of treatment effects (Callaway & Sant’Anna, 2021; Roth et al., 2023).

Mainly, in this study, the firms that applied and benefited from the tax credit were classified as a “treated” group, and firms that did not apply or benefit from the tax credit as a “comparison” group. The dependent variable is the full-time equivalent staff, which represents the outcome of interest. Independent variables include current R&D expenditure, labour costs, other current expenditures, capital expenditure, internal funds and PhD holders. As mentioned above, a dummy variable was created for firms that resorted to tax credits.

Regarding the estimators, to handle variations in treatment timing, estimators, such as the Callaway and Sant’Anna estimators for staggered settings, were chosen. Event-study plots (Figure 1) were also created to visualize the trends in FTE staff before and after treatment.

For the sake of concreteness, consider the following specification:

$$\log(PFTE)_{i,t} = \alpha_i + \phi_t + \sum_{r \neq 0} 1[R_{i,t} = r] \beta_r + \epsilon_{i,t} \quad (1)$$

where $R_{i,t} = t - G_i + 1$ is the time relative to treatment (e.g. $R_{i,t} = 1$ in the first treated period for unit i), and the summation runs over all possible values of $R_{i,t}$ except for 0.

Consider here the Callaway and Sant’Anna estimator for the average treatment effect on the treated (ATT), as follows:

$$ATT(g, t) = E[Y_{i,t} - Y_{i,g-1} | G_i = g] - E[Y_{i,t} - Y_{i,g-1} | G_i \in \mathcal{G}_{comp}]$$

We can then estimate $ATT_{(g, t)}$ by replacing expectations with their sample analogs,

$$\widehat{ATT}(g, t) = \frac{1}{N_g} \sum_{i: G_i = g} [Y_{i,t} - Y_{i,g-1}] - \frac{1}{N_{\mathcal{G}_{comp}}} \sum_{i: G_i \in \mathcal{G}_{comp}} [Y_{i,t} - Y_{i,g-1}]$$

4. RESULTS AND DISCUSSION

The results from the model (1) adopted suggest that the tax credit positively impacts the allocation of FTE staff at the firm level in the services industry. Moreover, this effect appears to increase over time, as Table 1 and the event plot below suggest.

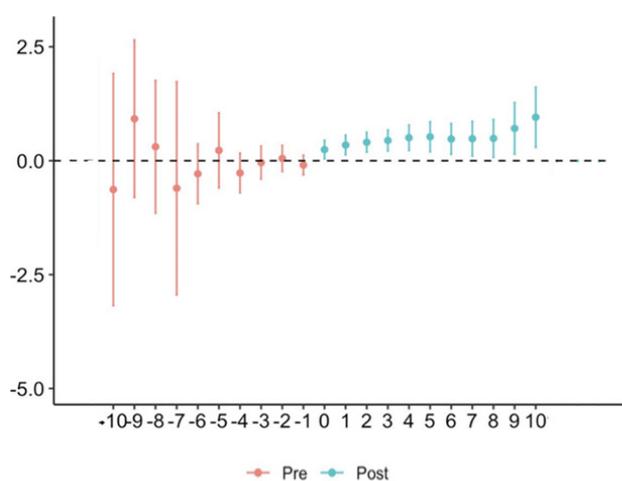
The infra plot (Figure 1) allows us to assess the plausibility of parallel trends and detect any outcome breaks around the treatment period. The DiD model is a valuable tool for analysing the impact of an R&D tax credit on allocating FTE staff, a twenty-three-year period spanning from 1995 to 2017.

As can be observed (Table 1 and Figure 1), the fact that the *red bars* include the zero (before the period zero) confirms that follows “parallel trends”. The subsequent periods – the *green bars* (after period zero) represent the yearly increase, observed in percentage terms. From the green bars, an increase consistent over time, on average, one percentage point per period, can also be observed.

Table 1. Average treatment effect and lower and upper bounds

Period	ATT	Lower Bound	Upper Bound
-10	-0,63290	-3,17852	1,91272
-9	0,92017	-0,81007	2,65041
-8	0,30673	-1,15139	1,76484
-7	-0,60404	-2,94528	1,73720
-6	-0,28809	-0,94437	0,36818
-5	0,22643	-0,59804	1,05090
-4	-0,26933	-0,70456	0,16589
-3	-0,04259	-0,40539	0,32022
-2	0,05030	-0,23692	0,33752
-1	-0,09511	-0,31000	0,11977
0	0,24402	0,03958	0,44846
1	0,34421	0,12732	0,56110
2	0,40436	0,18621	0,62251
3	0,44458	0,21450	0,67466
4	0,50505	0,22543	0,78467
5	0,52557	0,19437	0,85676
6	0,47644	0,13872	0,81417
7	0,48301	0,10235	0,86367
8	0,48887	0,07267	0,90507
9	0,70903	0,14213	1,27594
10	0,95410	0,29279	1,61541

Source: Own research

**Figure 1.** Average treatment effect by length of exposure

Source: Own research

These findings align with the results from [Martinez-Ros and Kunapatarawong \(2019\)](#), where the results showed a positive impact of R&D&I tax credit and environmental investment on employment for Spanish MSMEs (micro firms) and SMEs. In the same fashion, these findings are in line with the results observed in France in 2004 and 2005, where firms that benefited from the *Jeune Entreprise Innovante* scheme experienced higher annual employment growth, with an estimated growth differential of 8.4 percentage points compared with similar firms that did not receive the JEI scheme support ([Mitchell, J. et al., 2020](#)).

5. CONCLUSION

The limited number of studies on the impact of fiscal schemes on human resources poses a challenge in distinguishing between the merits of various designs of these policy instruments. Nevertheless, despite this limitation, there is sufficient evidence to suggest that the R&D tax credit implemented in Portugal positively impacts FTE staff allocation in the services industry.

The reported results contribute to the literature by indicating that, from the science and technology policy perspective, firms in the services industry that applied for tax credit incentives at least once are more likely to allocate FTE staff.

Policy incentives should be specific rather than generic, targeting and identifying more proactive firms in performing R&D activities. The analysis of the impacts of a public instrument on FTE staff for services industry firms contributes to the literature. Additionally, policymakers must invest in human capital to face potential skill shortages. More importantly, such policies must be designed and implemented to generate assets and yield net positive social returns.

R&D contributes to a firm's absorptive capacity, where FTE staff play a determinant role within firms as researchers, influencing absorptive capacity. Firms must develop their absorptive capacity by interacting with academia (Rafols et al., 2013).

The research highlights the impact of a policy instrument on the composition of FTE staff in the services industry. Therefore, policy instruments can be improved and better designed to boost R&D activities, particularly the allocation of FTE staff.

A promising avenue for future evaluation research is to investigate whether the impact of R&D tax credits on FTE staff allocation varies across different regions in Portugal (Are there specific geographic areas where the impact is more pronounced or less significant?). Future research should also explore whether the impact of R&D tax credits differs across different sub-sectors within the services industry (Are specific service sectors showing a more robust response to the tax incentive scheme compared to others?).

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Sustainable Agriculture and Development in Morocco

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Useful agricultural area



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Abstract: *This study allows the strengthening capacities and skills of actors, via Green Strategies. Sustainable agriculture plays an important role in improving the standard of living of the rural population and it is central in the management of natural resources, in order to set up sustainable development. In this context, it is necessary to prepare specialists capable of supporting the policies adopted by the Green Strategies; Green Morocco Plan (2008-2020) (Mapmdref, 2008) and Green Generation (2020-2030) (Mapmdref, 2020), in terms of quality, food security, water saving and environmental protection. Indeed, agriculture provides 45% of national employment, generates more than 65% of the income of rural households, and enhances 8.7 million ha of Useful Agricultural Area, of which 18% is irrigated. By green strategy, apart from edible oil, a good coverage ratio has been reached with sugar production at 62%, milk/meat at 70%, cereal products at 70%, and vegetables/fruits at around 100%.*

1. INTRODUCTION

The Moroccan authorities implemented agricultural policies based on the central choice of an import-substitution policy to ensure food security (Akesbi, 1985). In the 1980s, a change in the direction of agricultural policy took place. Agricultural policy has shifted from an interventionist model oriented towards food self-sufficiency to an increasingly liberal model (Akesbi, 2000).

It is important to remember that Moroccan farmers tend to assimilate the principles of a sustainable agricultural system. Their approach goes beyond methodology to embrace a philosophy of coexistence with nature rather than its exploitation (Nargisse, 2005). This involves innocuous management designs and procedures that work with natural processes to conserve all resources, minimize waste and environmental impact, and promote the resilience of agro-ecosystems.

Traditional farmers would dispute the claim that resilient agriculture is the agriculture most closely associated with sustainable agriculture, as many of them also use methods they view as preserving or enhancing the natural resource base (Razanaka et al., 2015; Chopin et al., 2021).

Technology transfer is defined as the application of scientific knowledge (education and research) of agriculture to achieve desirable national goals, for example, competitiveness, environmental sustainability, food self-sufficiency and food security (Arifi et al., 2001). This interpretation is broader than the traditional interpretation, in which the term refers to the transfer of technology from one company or country for commercial use elsewhere. This involves the development, communication and implementation of technological advances, primarily in the form of research, but also demonstrations and other technological initiatives. (Moussaoui, 1993; Jiang et al., 2016).

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2. LITERATURE REVIEW

The important question in this area should be: Is sustainable agriculture a farming system or a management strategy? Both can be accepted, and each term adds a perspective that helps explain the complexity of this multidimensional concept. The term has different meanings depending on the context. Regardless, sustainability in agriculture means a system of policies, institutions, the private sector and communities providing goods and services while preserving natural resources and the environment (Makino, 2013). The objectives can be multiple and diverse depending on the specific time and place, including food security, the eradication of poverty, the development of local/national economies, the protection of cultural assets, etc. An essential condition for farmers to support sustainable agriculture is the use of conservative technologies and practices, minimizing dependence on external inputs and increasing local human and social capital (Sayanagi, 2017; Dahiya & Okitasari, 2018).

2.1. Socio-Economic Factors of Morocco

The Kingdom of Morocco is located in the north of Africa, 14 km from Europe; its political system is a unitary semi-constitutional monarchy with an elected parliament. The capital of Morocco is Rabat, the population is approximately 37 million inhabitants, spread over a total area of 712,550 km² (71.26 million Ha) (BBC, 2023).

The gross domestic product GDP has increased to 122 billion euros. (Moroccan Dirham, MAD). In addition, GDP by sector of activity varies depending on agriculture: 14.8%, industry 29.1% and services 56.0%. The active population exceeds 10.399 million, of which 39.1% is in agriculture, 20.3% in industry and 40.5% in services. With all sectors combined, the unemployment rate is around 9.23%. Concerning nominal GDP, it should increase by 6% in 2024, bringing inflation, measured by the implicit GDP index, to 4.5% in 2023 after having recorded 3.1 % in 2022 (HCP, 2024).

Agricultural activities should therefore record an increase of 2.5% in 2024, contributing to GDP growth of 0.3 points. Taking into account an improvement in maritime fishing activities, the primary sector should generate an added value improvement of 2.7% instead of an increase of 6.7% estimated for 2023 (HCP, 2024).

2.2. Edapho-Climatic Characteristics

In Morocco, the climate is typically Mediterranean on the coast with a mild winter (9 to 12°C) and moderately wet, coupled with a hot and dry summer (24 to 26°C). In the hinterland reliefs, precipitation can reach a maximum of more than 1500 mm per year with snow in winter. Precipitation and temperature are strongly influenced by the Atlantic Ocean to the west. The used agricultural area is approximately 8.8 million Ha, the forest area is approximately 5.5 million Ha and pastures are approximately 21 million Ha (Mapmdref, 2020; BBC, 2023).

2.3. Pillars of Sustainable Development

Sustainability is based on the principle that “we must meet the needs of the present without compromising the ability of future generations to meet their own needs.” (WCED, 1987, 1990; Bosselmann, 2017). Sustainability is broken into four distinct areas, known as the four pillars of sustainability: Human, Social, Economic, and Environmental Sustainability. Sustainable

development is a broad term to describe policies, projects and investments that provide benefits today without sacrificing environmental, social and personal health in the future. These policies are often described as green because they focus on limiting the impact of development on the environment (Bosselmann, 2022).

2.4. Why Sustainable Agriculture?

The current situation is alarming, and we are currently experiencing five difficulties: a) Natural resource degradation and pollution and human health problems, b) Poverty and Food insecurity are still there, c) The economy is in trouble, d) The population is increasing, and finally e) Climate is changing (Makino, 2013). Otherwise, Sustainable Agriculture is a system, that involves farming systems that are environmentally sound, profitable, productive and compatible with Socio-economic conditions (Pesek, 1994).

Sustainable Agriculture is a system of policies institutions and communities that provide food and fibers to conserve natural resources and environments, pursuing multiple objectives that are place and time specific as; Food security, Poverty eradication, Development of local and national economies, Cultural heritage, etc. (Makino, 2013; Bosselmann, 2022).

Sustainable agriculture is perceived in many circles to provide solutions to most of these problems. Sustainable production systems substantially reduce erosion, principally due to the use of sophisticated crop rotations and organic matter management techniques, and surface and groundwater contamination. The use of toxic materials in production is very low in comparison to conventional systems, so the environmental and health problems associated with their use do not occur (Savini, 2005). Energy use in sustainable systems may be reduced by up to 60%, depending on the region and production system. Many producers use older, sometimes rare, crop cultivars and animal breeds because they find them more appropriate in their production systems. Diversified crop production systems, windbreaks, and the more diversified landscape associated with sustainable agriculture systems often contribute to improved and varied wildlife habitats (Tharp, 2011; J.P. & Berendse, 1999).

3. METHODOLOGY

3.1. Socio-Economic Diagnosis before Green Strategies

The low investment capacity was initially expressed by a very low participation of the banking system in financing, where just 18% of farmers benefit from the granting of loans. Then a weakness in the agro-industry fabric, which can barely reach 24% of industrial units and 30% of processing units, strongly degrades the added value of the main agricultural sectors (Akesbi, 1985, 2000).

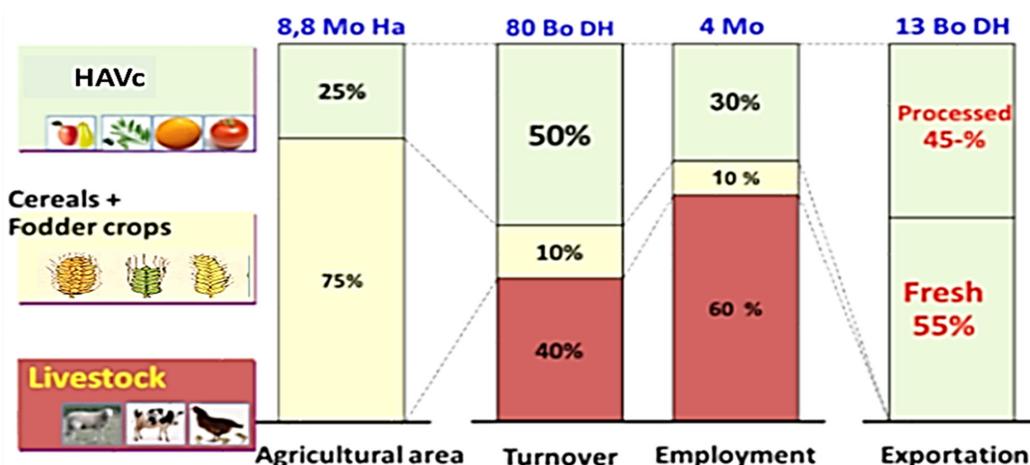
At the same time, the level of organization of agricultural professions appears very low and there is a virtual absence of inter-profession. At the time, 3 to 4 sectors, were more or less organized. In the same framework of socio-economic analysis, it is worth mentioning the archaic management of agricultural operations, accompanied by unsuitable management structures (Lairez et al., 2015).

Concerning agricultural land, it shows excessive fragmentation (70% of agricultural holdings < 2 ha), however with an apparent complexity of legal status, and a very low registration and

registration rate. Consequently, this alarming situation in 2008-2009 deprived farmers of all possibilities of investment and modernization, thus limiting their activity to food crops, in particular cereal farming, which occupies 75% of the usable agricultural area (UAA), and only represents 10 to 15% of total agricultural turnover (Figure 1). However, the high-added-value crops (HAVc) occupied only 25%.

Water resources are influenced largely by climate change, a prolonged water shortage sometimes with an abundance of structural drought which continues to worsen until today, characterized by the weakness and irregularity of the rainfall (Lairez et al., 2015; Akesbi, 2010).

This analytical observation has necessarily led to the undervaluation and overexploitation of surface and groundwater, through an ineffective and inefficient irrigation system.



HAVc: high added value crops; Mo Ha: million hectares; Bo DH: billion Moroccan Dirham

Figure 1. Configuration of the Moroccan agricultural sector

Source: Mapmdref, 2008

Despite the importance of agricultural areas (around 75% of the UAA) intended for cereal, fodder crops, and this production has not benefited from the advantages of export to member countries. In addition, it benefited from barely 10%, respectively in turnover and employment.

Thus, this technical-economic observation has led us to broadly and profoundly rethink Moroccan agricultural policy. Hence a continuous green revolution with two phases, namely the importance of the launch of the Green Morocco Plan 2008-2020 strategy (Mapmdref, 2008) and which is followed by the Green Generation strategy (2020-2030) (Mapmdref, 2020).

3.2. Economic and Social Betting

Economic betting: the agriculture sector contributes around 19% of the national GDP, which is combined around 15% for agricultural production, and about 4% for food industries. In addition, we try to reach the essential role in macroeconomic stability.

Social betting: the main importance challenge is to employ 4 million rural residents, by creating 100 000 job opportunities in the agricultural industry. About 14 million people live in villages, 80% of whom depend on agriculture. Therefore, this program should ensure food security for more than 36 million consumers in Morocco.

3.3. Green Strategies for Sustainable Agriculture in Morocco (2008- 2030)

To tackle the challenges of development, Morocco has established two Strategies as a green revolution in order to reach the main goal of sustainable development. These green strategies are entitled: 1- Green Morocco plan 2008-2020 (Mapmdref, 2008); 2- Green Generation 2020-2030 (Mapmdref, 2020).

The design and implementation of these strategies are described and illustrated in the following paragraphs.

3.4. Design of Green Morocco Plan GMP 2008-2020

Adopted in April 2008 by the Moroccan Government, the Green Morocco Plan aims to make the agricultural sector the main engine of the country's economic growth. To achieve its ambitious objectives, the Green Morocco Plan targets small and medium-sized family farms and entrepreneurial farms with large areas and access to capital. In a few years, Morocco has considerably increased public investments allocated to the agricultural sector, which has notably increased in cultivated areas.

The Green Morocco Plan GMP as a national strategy constitutes the best roadmap for a successful formula of sustainable agriculture. The different components of this project are shown in Table 1 below.

Table 1. Project of National Agricultural Program

Green Morocco Plan "GMP"	Pillar 1	Pillar 2	Cross-functional Project	Total
Nbr. of Projects	961	545		1506
Investment (Bo. MDH)	52	20	75	147
Nbr. Farmer	560.000	840.000		1.4 Mo

Source: Mapmdref, 2008

4. RESULTS & FINDINGS

4.1. Analytical Description of the GMP Pillars

Two pillars for two production models. The Green Morocco Plan "GMP" is divided into two pillars. The first aim for the "aggressive development of high value-added agriculture" is partly oriented towards export, while the second is intended for "solidarity support for small-scale agriculture". Large farms benefit from various supports: investment aid, and rental of land at low prices over a long period in exchange for an investment commitment. Small farms benefit from subsidies to set up individual or collective projects (tree planting, olive crushing unit, etc.). These subsidies sometimes cover up to 100% of the cost of the investment. The first Pillar receives the majority of funding: when it was launched, the PMV planned to implement 1,506 projects (including 961 on Pillar I and 545 on Pillar II) for a total investment of MAD 147 billion; with 52 billion for Pillar I projects, 20 billion for Pillar II projects and 75 billion MAD for cross-functional actions (Mapmdref, 2020).

To achieve these objectives, the Green Morocco Plan is based on seven pillars, aiming to implement the principles of sustainable agriculture, according to three main components, namely:

- a) **Mode of intervention:** As part of this approach, agriculture must become the main lever of growth in the next 10-15 years (foundation 1); then, adopt aggregation as a model for organizing agriculture, and approval of aggregation as a regulatory mechanism (foundation 2); finally, ensure the development of Moroccan agriculture as a whole without any exclusion, hence the interest of the two pillars P1 and P2 (foundation 3) (Mapmdref, 2020).
- b) **Investment System:** in this context, private investments must be encouraged with public assistance (foundation 4); then, adopt a contractual approach to realize the contractual approach of the Green Morocco Plan, the objective of which is the realization of 1,500 projects (foundation 5) (Mapmdref, 2020).
- c) **Sustainable Agriculture:** sustainability is a strategy aimed at supporting the development of Moroccan agriculture, through the promotion and improvement of natural resources following the principles of sustainable agriculture (foundation 6). Finally, it would be beneficial to repair the overhaul of the sectoral framework (real estate, taxation, market, etc.) and to reform the infrastructure and logistics linked to the good governance of sustainable development (foundation 7) (Mapmdref, 2020).

Specifically, this program plans to intensify agricultural production (P1); promote employment in rural areas (P2), create 1.5 million additional jobs; increase the value of agricultural exports (P1); and contribute to the fight against poverty in rural areas (Table 1).

4.2. Restrictions and Obstacles

At the start of the launch of the Green Morocco plan strategy, the growth rate of the Moroccan economy was 4.8% in 2009, an increase of 0.5 points compared to the estimate announced by the HCP. This development results from the following actions; the 1.6% drop in volume in the added value of the agricultural sector (excluding fishing) compared to an increase of 30.4% in 2009; the 4.2% increase in the added value of other sectors of activity (taken as a whole) compared to 0.8% a year earlier; and the 6.7% increase in volume of taxes net of subsidies affecting products instead of 4.6% the previous year. This is how the growth rate of GDP excluding agriculture increased from 1.2% in 2009 to 4.5% in 2010 (HCP, 2024).

Climate change is the main component of obstacles. After a significant drought in 2016, the Moroccan economy, which includes a favorable agricultural cycle, is expected to rebound in 2017. Driven by an above-average cereal harvest, economic growth increased by 4.3% in the first half of 2017 (compared to 1.6% during the same period in 2016). Growth in non-agricultural activity, however, remained less pronounced, at 3.3% (HCP, 2024).

4.3. Strengths and Features

The main factors retained are as follows: 1-The geographical location and proximity to the European market; 2- Dynamic national market; 3- Population growth; 4- Presence of qualified labor; 5- Proven benefits of numerous products (HAV); 6- Numerous efficient agricultural economic models (COPAG, n.d.; ANOC, n.d., etc.).

Morocco's main exporting sectors are the automotive industry (28.4%), the agricultural and agri-food sector (21.8%) and phosphates, of which Morocco holds the largest reserves in the world. Tourism also plays an important role in the Moroccan economy. Representing 7% of GDP (HCP, 2024). Indeed, Morocco attracts a large population of tourists with its natural wonders,

its imperial cities, its climate, and the diversity of its multiple ecotourism composed of aromatic and medicinal plants, crafts and socio-cultural heritage (case of the M' Goun Geopark) (UNESCO, 2015). Population growth is often combined with the emergence of a highly skilled and ambitious workforce category for creativity and innovation at different scales; know-how, interpersonal skills and well-being. As an example, we cite successful transaction models, proven assets for many high-value-added products (fruits and vegetables, etc.), and the success of numerous agricultural and food economic models such as COPAG (n.d.), ANOC (n.d.), COSUMAR (n.d.)...etc.

The actions of this program are distributed separately between pillar 1 (P1) and pillar 2 (P2), and concern approximately 1506 projects, with a budget of 147 million MDH, and aimed at approximately 1.4 million farmers (Table 1).

The first pillar P1 indicates modern agriculture with high added value, and favoring irrigated and fallow agriculture, which is preferred. The second pillar (P 2) indicates solidarity agriculture, which exists in mountain areas, oases and even rainfed agriculture.

Concretely, this plan saw an intensification of agricultural production; promotion of employment in rural areas; increasing the value of agricultural exports; contribution to the fight against poverty in rural areas; and improving the level of food security (Table 2).

Table 2. Action program of the main agricultural sectors

Agricultural sectors	Area (1000) Ha		Production (T)		Budget (Bo. MDH).	Coverage ratio %	
	2008	2020	2008	2020	2020		
Years							
Sugar production	64	74	3.8 Mo-	4.2 Mo	4.85	62%	
Oil product	Sunf./ Rap.	25	32	46 Thd	4	10% (950 CU), (75 PPU)	
	Pea. / Ses.	10	14	32	32		5
Cereal products	5400	4600	6.3 Mo	86 Mo	4,3 (p. subsidies)	70%	
Production of	Milk	1.6 Mo Cows	1.8 Mo Cows	1.7	2.5 Bo.L	Tur: 6.../. Av: 2,7	70% 50 Mo WD
	Meat	400.000 T	606.000 T	300	600 Thd	Tur : 9 .../ Av: 4,2	

Sunf. : sunflower; **Rap.**: Rapeseed; **Ses.**=Sesame; **Mo**=Million; **Thd**=thousand; **Bo**= billion; **L.**=liter; **WD**= work days; **CU**= crashing unit; **PPU**= processing and packaging unit; **MDH**= Moroccan dirhams; **Tur**.: Turnover; **Av.**: Added value.

Source: Mapmdref, 2020

4.4. Socioeconomic Impact

4.4.1. Economic impact

The PMV had a positive economic impact, as the gross domestic product (GDP) doubled from 65 billion MDH to more than 128 billion MDH. Concerning exportations have been multiplied by 2.4, to reach a satisfactory figure of around 35 billion MAD, i.e. 80% of the programmed objective. Private investments experienced a significant increase, reaching a total amount of 63 billion MDH (Akesbi, 2000; HCP, 2020).

According to the new data, the coverage of basic agricultural products was able to reach, except for edible oil, a satisfactory level, ranging from 50 to 100%. This trend in the coverage rate

particularly affected the following sectors: sugar 62%; table oil 10%; meats and milk 70%, cereals 70%; and fruits and vegetables around 100% (Table 2).

4.4.2. Social Impact

On a social and household level, the PMV has enabled more additional working days of +50 million days. In addition, this strategy recorded an increase of 250,000 additional farmers, including women, out of 1.5 million active farmers (AGRIBLE, 2017). In other words, more than 30% of farmers were able to position themselves in the labor market, with a satisfactory level of exploration.

A dynamic of integration was well promoted by the PMV strategy, which was able to alleviate the problem of unemployment in rural areas, by offering the opportunity to new beneficiaries; around 2.7 million small and medium-sized organizations, to access the job market. Table 1, shows that farmers in P1 benefited four times (4 x) from the general budget compared to P2. However, farmers in P2 (60%) only benefit from 1/6 of the total budget. Other across-functional actions, i.e. transversal projects; like infrastructure and logistics are largely intended for the two pillars together such as bridges, roads, commercial sites or markets, etc.

4.4.3. Environmental Impact

The new technologies of the irrigation system, in particular the drip system, have made it possible to save a volume of great importance, having been able to reach a volume of 2 billion m³. This is a surplus to be exploited to fill the water deficit which has existed for several years and which continues to intensify with periods of drought. At the same time, this improvement was materialized with the expansion (3.7x) of agricultural areas equipped with hydro-agricultural equipment to reach +547000 ha. In fact, the agricultural area irrigated by the drip system increased from 145000 ha to 692000 ha, out of a global irrigated area of 1.5 million ha. This situation results in an intensification of arboricultural areas with an increase of 450000 (Akesbi, 2000).

5. CONCLUSION

This agricultural policy model cannot of course be reproduced identically in West Africa due to different agronomic, climatic, economic, social and political conditions. The Green Morocco Plan, however, offers avenues for reflection or inspiration, such as the need for significant public investment in agriculture and food security (from State revenue and budgetary aid), the reaffirmed need to support family farming, the provision to farmers of financial resources and clear rules for accessing them. Indeed, the three components (Intervention, Investments and Sustainability) retained in the foundations of the PMV will be retained as an essential basis for defining a successful path to the establishment of sustainable agriculture, not only in Morocco but also across West Africa (Jiang et al., 2016; Makino, 2013).

The PMV is, in fact, a continuation of previous policies, that protect the environment and strengthen natural resources (Chopin et al., 2021): it involves developing agriculture for promising sectors and according to a productivist approach (intensification of production through mechanization, irrigation, use inputs and genetic improvement) to improve national food security and increase agricultural exports. Apart from olive Oil products 10%, results of GMP have shown a good coverage ratio with agricultural sectors, sugar production 62%, meat/milk 70%, cereal products 70%, and around 100% of vegetables /fruits are reached.

To accomplish its mission in the development of sustainable agriculture, Morocco launched a second strategy called Green Generation spread over 10 years from 2020 to 2030, including here the main pillars and axes of implementation (Akesbi, 2000).

By the first pillar, it is great to continue the dynamism of agricultural development, in order to achieve the consolidation of agricultural sectors (Resilient and eco-efficient agriculture), to make a modern and efficient distribution chain, and to establish perfect quality, innovation and Green technology.

Concerning Pillar 2 the priority is given to the human element, to set up a New generation of the agricultural middle class; a New generation of young agricultural entrepreneurs, and finally reach a New generation of agricultural organizations, where the profession will be able to manage 30% of the public budget (Akesbi, 2000).

This second green generation strategy, which completes the first strategy of the Green Morocco Plan, becomes necessary to finalize the general design of sustainable agriculture capable of rebooting the sustainable development system while basing itself essentially on the principles of good governance.

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Comparative Analysis of Cloud-Based and Traditional Accounting

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Abstract: *This article explores the changing landscape of accounting information systems, focusing on the transformative impact of cloud-based technologies. Through an analysis of various studies, we investigate how digital technologies and cloud computing are reshaping accounting paradigms. The global perspective highlights the influence of mobile and cloud approaches on accounting information systems worldwide. Additionally, the article examines the challenges and opportunities in implementing cloud accounting systems, offering a comparative analysis that contrasts traditional accounting with cloud-based alternatives. This research enhances understanding of the current trends shaping the field of accounting information systems, providing valuable insights for practitioners and researchers.*

1. INTRODUCTION

In today's context, the rise of cloud accounting is reshaping how businesses operate and manage financial data. Unlike the traditional method of installing and maintaining software on individual computers, cloud accounting allows for easy access to information from different locations while ensuring everyone uses the same software version. While some might feel like cloud accounting has been around forever, it's actually a recent innovation. Despite the attention it receives, accounting professionals in businesses, particularly those in smaller companies, are facing challenges posed by the technological impacts of the Internet.

In Croatia, where cloud accounting is still new, businesses must focus on getting a competitive edge in the global market, similar to what developed countries are doing. The newest data from the [Croatian Bureau of Statistics \(2023\)](#) show that in 2023, 45% of businesses in Croatia used cloud services, and the use of it does not differ significantly among businesses of different sizes. This marks a rise of 6 percentage points from the year 2021. The type of cloud service that dominates is processing electronic mail (88 % of businesses) or data storage (74 %), while the use of accounting software in the cloud is less pronounced (57%). However, there is also an increase compared to 2021 where 52% of businesses that used cloud services utilized them for accounting purposes. While people in developed countries are enjoying the benefits of cloud technology for various uses, there seems to be less awareness and interest in Croatia. This study aims to motivate Croatian entrepreneurs to incorporate cloud technology into their operations by highlighting the specific advantages of its application in accounting. Additionally, it seeks to provide a concise summary of challenges associated with the implementation process.

In the field of accountancy, change is unavoidable, leading to greater responsibilities for professional accountants. The significant driver behind this transformation is technological advancement,

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requiring ongoing adaptation for survival, marked by continuous learning and the development of new skills and attitudes (Barišić et al., 2020). These changes underscore the need for prompt adaptation and the transformation of business practices while ensuring that the fundamental accounting rules and principles remain integral to the profession (Gulin et al., 2019).

Research questions in this study are:

- **RQ1:** How do cloud-based technologies shape global accounting information systems?
- **RQ2:** What are the challenges and opportunities of implementing cloud accounting compared to traditional methods?

This research is based on a systematic review of relevant professional and academic literature, organized into five main sections. The introduction provides the study's context, followed by a comprehensive literature review. The third section outlines the research methodology, and the fourth section provides insights into the influence of cloud-based technologies on the structure of global accounting information systems and the challenges and opportunities associated with implementing cloud accounting compared to traditional methods. Additionally, strategies will be proposed to promote a more accessible adoption of cloud accounting for a larger audience. The paper concludes by summarizing the main findings, acknowledging limitations, and suggesting potential directions for future research in this area.

2. LITERATURE REVIEW

Traditional accounting software, in the era before cloud computing, operated on desktops. It had limitations such as restricted data access, frequent software updates, and ongoing expenses for data backup. This system required a significant initial payment, treated like a fixed cost, and needed an IT team for setup and continuing support. There was a risk of physical damage to equipment leading to data loss, and over time, maintenance costs and depreciation reduced equipment value, potentially diverting business owners' focus (Mihai & Duțescu, 2022). In contrast, cloud accounting, also known as online accounting, retains the same functionality but shifts the entire process to the cloud (Khanom, 2017). Users log in directly to an online solution, ensuring up-to-date data is securely stored on cloud servers. Cloud accounting provides a transparent view of costs, typically involving monthly payments if contract conditions are well-negotiated (Dimitriu & Matei, 2014, 2015, 2022). It represents a form of cloud computing designed specifically for processing financial data and relocating the installation, processing, and data storage of accounting systems and services from on-premise to remote servers owned by cloud service providers (Mihai & Duțescu, 2022). "Cloud technology is one of the main innovative tools that have recently begun to be used in financial accounting. More than half of business entities today already use cloud technology in their financial accounting." (Khomiak et al., 2022, p. 93)

Cloud computing has fundamentally transformed the landscape of accounting through its seamless integration with core business operations. According to Dimitriu and Matei (2014) the modern accounting approach, called 'co-developed,' focuses on being easy to use and encourages teamwork. This helps overcome the complications and high expenses linked to traditional financial accounting applications. Cloud accounting, or 'online accounting,' operates on cloud service providers' servers, delivering services without the need for software installation or significant infrastructure investments. This innovative approach emphasizes flexibility and efficiency in managing financial aspects and overall business dynamics. While an official definition for 'cloud accounting' is not universally established, its advantages and functionalities,

such as service without software installation or infrastructure investment, characterize this innovative approach (Dimitru & Matei, 2014).

Despite the acknowledged benefits and progress of cloud technology in theoretical research, there is still resistance to its practical implementation. Bridging this gap requires increased pressure from both the government and competitors to promote successful adoption. In Isip's (2023) study, "What Digital Technologies are Used Today by Accounting Firms to Deliver Services", the focus is on the current use of digital technologies in accounting firms for service delivery, investigating the factors driving adoption and their resulting impact. Using institutional theory as a framework, the study concentrates on the accounting services industry in Romania and employs semi-structured interviews as the primary research method. "Results indicate that the adoption of digital technologies in accounting firms is mainly driven by coercive and mimetic isomorphic pressures from the state and competitors" (Isip, 2023, p. 1974). International and network-affiliated accounting firms tend to adopt digital technologies more extensively than their local independent counterparts. Isip's (2023) research emphasizes the use of automation solutions, such as electronic invoicing systems, to reduce processing time and maintain quality. Ultimately, the findings illuminate the current digital tools used in accounting services and their implications for both large and smaller firms.

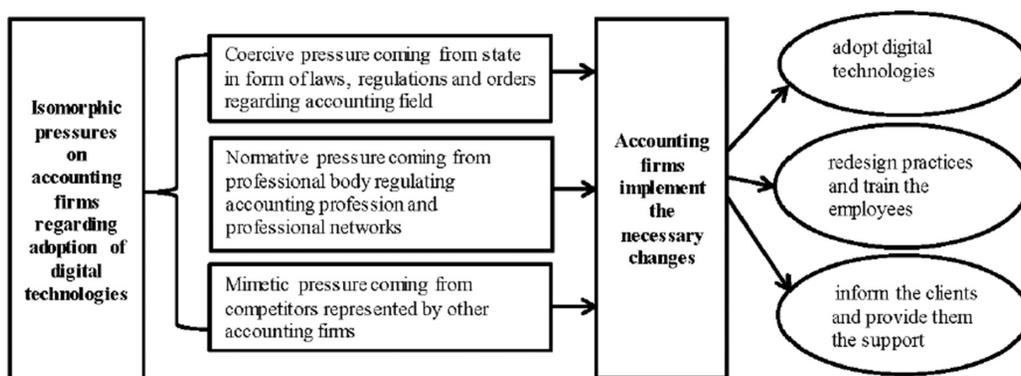


Figure 1. Isomorphic pressures on accounting firms to adopt digital technologies

Source: Isip, 2023, p. 1974

According to Zhang et al.'s conceptual model, which is based on a case study conducted in China, both firm and executive characteristics play a crucial role in shaping the momentum and willingness for digital transformation. The authors propose two key determinants for achieving successful digitalization in accounting: "organizational capabilities and digitalization in the business process" (Zhang et al., 2022, p. 2). Their case study findings emphasize that the learning and accumulation of organizational capabilities form the foundation of digitalization. Simultaneously, firm and executive characteristics influence a firm's digital strategy and its decision to embark on the digitalization journey. In the face of intense competition and technological change, firms are unlikely to secure sustainable advantages or achieve digital transformation solely through imitation. "However, the development of organizational capabilities makes firms more resilient to market turbulence and more mature in DIA (digitalization in accounting)" (Zhang et al., 2022, p. 12).

3. METHODOLOGY

This study centers on the term "cloud accounting," utilizing the widely recognized Web of Science database for scholarly publications. The initial search generated an extensive 19,440

records related to “cloud accounting,” with 9,995 articles falling under the open-access category. To narrow the focus, the decision was made to examine publications within a specific time-frame, spanning from 2014 to 2023. This temporal constraint reduced the dataset to a more manageable 6,179 articles.

The dataset was further refined using Web of Science categories, identifying 58 articles in the domains of “business” and “business finance.” This step underscored the interconnectedness of cloud accounting with broader financial and commercial contexts. Another alteration considered the linguistic aspect, narrowing the dataset to articles published only in English and resulting in a subset of 55 articles. This linguistic criterion aligns with the global prevalence of English in scholarly communication and recognizes the international nature of cloud accounting research.

These methodological steps collectively underscore the comprehensive approach taken to navigate the extensive domain of cloud accounting within the academic landscape. The resulting analysis not only provides a snapshot of the current state of cloud accounting research but also lays the groundwork for future, more in-depth examinations. It provides detailed insights into the development, trends, and key areas of focus in this rapidly expanding research field.

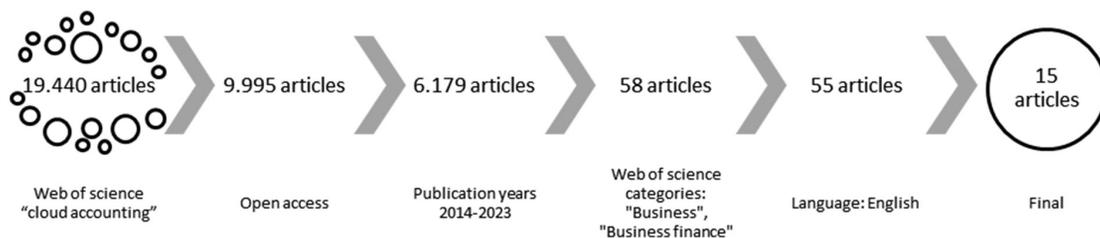


Figure 2. Implementation of the research process

Source: Own research

4. RESULTS AND DISCUSSION

4.1. The Impact of Cloud-Based Technologies on the Evolution of Global Accounting Information Systems

From a global perspective, business development now mostly relies on the widespread utilization of Internet, mobile, and cloud technologies. “In terms of technology and cloud services, this new approach has led to a new business model paradigm, namely the cloud business model paradigm. This paradigm significantly impacts the business strategies of companies, the way companies do business and define the hardware, software and communication infrastructures, risk management and cost management” (Brandas et al., 2015, p. 89). According to Lapitkaia (2021) with cloud technologies, traditional accounting tasks become more efficient. This includes managing electronic financial and managerial records, maintaining tax records, compiling statistical reports, generating primary accounting documents, and performing tax and insurance premium calculations.

Services that may be based on cloud technology are software as a service (SaaS), infrastructure as services (IaaS), and platform as services (PaaS). “From the point of view of an accounting organization, the most convenient of these three types of services is the service as a software” (Lapitkaia, 2021, p. 90). „Software as a Service (SaaS) as a model of information services and resources is their full provision. In this case, the service provider provides the components necessary for the

operation and administration of the information solution, including data. In turn, the service recipients (clients) administer the received information services within their responsibility, manage access to the requested services for their administration” (Lapitkaia, 2021, p. 92).

Table 1. SWOT Analysis for Cloud Accounting

<p>Strengths:</p> <ul style="list-style-type: none"> • Data Security Measures: Cloud accounting systems often employ robust security measures to protect sensitive financial data, reducing the risk of unauthorized access or breaches. • Real-Time Data Access: Cloud accounting facilitates real-time access to financial information, offering users immediate insights and enhancing decision-making processes. • Automated Backups: Automatic backup features in cloud-based systems contribute to data redundancy and ensure the availability of financial information in case of system failures. • Efficient Collaboration: Cloud platforms enable seamless collaboration among team members, promoting effective communication and teamwork in financial tasks. 	<p>Weaknesses:</p> <ul style="list-style-type: none"> • Dependence on Internet Connectivity: The reliance on Internet connectivity may result in disruptions or delays in accessing financial data, particularly in regions with limited or unreliable Internet access. • Integration Challenges: Transitioning to cloud accounting may present integration challenges with existing systems, leading to potential complexities in workflow and software compatibility. • Initial Training Requirements: Implementing cloud accounting may necessitate staff training to familiarize them with the new tools, potentially causing initial disruptions in operations.
<p>Opportunities:</p> <ul style="list-style-type: none"> • Enhanced Cost Efficiency: Cloud accounting offers cost-saving opportunities by eliminating the need for extensive physical infrastructure, and reducing maintenance, hardware, and IT support costs. • Scalability: Cloud solutions provide scalable options, allowing businesses to easily adjust resources based on their evolving needs, whether it involves increased data storage or processing power. • Strategic Automation: Automation features in cloud-based accounting systems streamline repetitive tasks, enhancing operational efficiency and minimizing the risk of human errors. 	<p>Threats:</p> <ul style="list-style-type: none"> • Security Concerns: The increasing sophistication of cyber threats poses a potential threat to the security of financial data stored in cloud systems. • Regulatory Compliance: Evolving regulations and compliance standards may pose challenges for businesses using cloud accounting, requiring continuous efforts to stay compliant. • Vendor Reliability: Dependence on a third-party cloud service provider introduces the risk of service disruptions, system outages, or the vendor's financial instability. • Data Ownership and Control: Concerns over data ownership and control may arise, particularly when financial data is stored externally, raising questions about who has access to and ownership of sensitive information.

Source: Authors based on Brandas et al., 2015; Khanom, 2017; Moll, & Yigitbasioglu, 2019; Mihai & Duțescu, 2022; Isip, 2023

According to Mihai and Duțescu (2022, p. 854), the types of companies for which cloud accounting will be a better solution than traditional accounting include the following: companies with a small budget, teleworking businesses, small and medium-sized companies, and companies with insecure physical space. Cloud accounting is a cost-effective option for financially constrained companies. It stands out by providing features like monthly payments based on usage, avoiding the need for substantial initial investments, which is different from traditional accounting methods. Particularly advantageous in the era of teleworking, cloud computing provides a secure platform for remote operations, addressing the evolving needs of businesses amidst the pandemic and shifting national regulations, distinguishing it markedly from traditional accounting methods. Small and medium-sized enterprises, grappling with data security challenges, find cloud accounting more appealing due to enhanced protection through secure access controls—a feature not as seamlessly integrated into traditional accounting systems. Moreover, cloud accounting proves beneficial for businesses located in physically insecure spaces, mitigating the risk of potential physical damage to hard drives storing critical data, and providing a distinct advantage over traditional accounting approaches. Even in the context

of remote work, where concerns about physical damage to devices like laptops prevail, cloud accounting demonstrates superior mitigation strategies compared to traditional methods.

Khanom (2017, p. 33) identified a multitude of factors influencing a company's decision to adopt cloud services. Firstly, it allows companies to focus on their core competencies, as outsourcing IT functions is often more cost-effective and reliable, enabling them to allocate resources to business growth. Secondly, cloud services enhance business agility, allowing companies to adapt their technology needs without the constraints of capital, people, or time associated with maintaining an onsite data center. Lastly, the use of cloud services minimizes capital expenditures, offers scalability for peak seasons, provides access from anywhere with internet connectivity, and allows for staffing efficiency by outsourcing specialized technical roles as needed.

Table 1 provides a comprehensive SWOT (Strengths, Weaknesses, Opportunities, Threats) analysis for Cloud Accounting, offering a detailed examination of its internal and external factors. This analysis aims to highlight the key aspects that contribute to the suitability and challenges of cloud accounting in comparison to traditional accounting methods.

Understanding and navigating these challenges while capitalizing on the opportunities can significantly impact the success of the transition from traditional accounting to cloud accounting.

5. CONCLUSION

Global business development is increasingly shaped by the widespread utilization of Internet, mobile, and cloud technologies, with the cloud business model paradigm significantly impacting various aspects of companies' operations. Cloud technologies, particularly in the form of Software as a Service (SaaS), have streamlined traditional accounting tasks, making processes like managing financial records and tax calculations more efficient. This shift has led to a preference for SaaS among accounting organizations due to its comprehensive information solution provision.

Cloud accounting emerges as a cost-effective option for financially constrained companies, offering monthly payments based on usage and avoiding substantial initial investments, which distinguishes it from traditional accounting methods. The advantages of cloud computing are particularly evident in the era of teleworking, providing a secure platform for remote operations and addressing evolving business needs amid the pandemic. Small and medium-sized enterprises find cloud accounting appealing due to enhanced data security through secure access controls, offering protection not seamlessly integrated into traditional accounting systems.

The decision to adopt cloud services is influenced by various factors, including cost-effectiveness, business agility, and minimized capital expenditures, allowing companies to focus on core competencies and allocate resources to business growth. Cloud services provide scalability, access from anywhere, and staffing efficiency by outsourcing specialized technical roles, contributing to enhanced operational flexibility.

This article presents a SWOT analysis for Cloud Accounting, emphasizing key internal and external factors that contribute to its suitability and challenges compared to traditional accounting methods. Strengths include robust data security, real-time data access, automated backups, and efficient collaboration, while weaknesses encompass dependence on internet connectivity, integration challenges, and initial training requirements. Opportunities lie in enhanced cost

efficiency, scalability, and strategic automation, while threats include security concerns, regulatory compliance challenges, vendor reliability, and data ownership/control issues. In navigating these challenges and capitalizing on opportunities, companies can significantly impact the success of transitioning from traditional accounting to cloud accounting in the dynamic global business environment. Continuous efforts are required to stay compliant with evolving regulations, address security concerns, and manage potential disruptions, ensuring a successful and seamless adoption of cloud accounting practices.

In conclusion, this study has a limitation in terms of its confined literature coverage, making it non-comprehensive. The primary focus was to clarify aspects related to challenges, opportunities, advantages, limitations, and potential solutions tied to the use of cloud technologies versus traditional accounting, considering perspectives from both scientific and professional communities. Despite the widespread global adoption of digitalization, a noticeable gap exists in professional and academic research regarding their implementation in accounting. Future research should prioritize conducting primary research through surveys and in-depth interviews to gain valuable insights into the evolving role of accountants in the context of digitalization.

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Using Openai's Chat GPT in Accounting: Pros, Cons Ethical Issues and Evaluating Its Role in Supporting Double-Entry Bookkeeping

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Abstract: Purpose. *This study researches the distinctive integration of OpenAI's Chat GPT within the domain of accounting, placing a particular emphasis on evolving ethical considerations. The paper also presents two scenarios demonstrating how open Chat GPT can be employed in double-entry accounting, highlighting the pros and cons of their usage.*

Aim. *The primary objectives are as follows:*

1. *To assess the impact of open Chat GPT integration on accounting processes.*
2. *To understand how accounting professionals perceive and address ethical concerns in the utilization of open Chat GPT.*
3. *To evaluate the effectiveness of open Chat GPT in supporting double-entry bookkeeping accounting.*

Methodology. *In the exploration of contemporary management practices, this research investigates scholarly papers and online resources, utilizing platforms such as Google Scholar and Google Search. The period under consideration spans from 2021 to 2023. On November 23, 2023, we conducted a practical test to use Chat GPT's ability to assist in accounting entries related to X-Hotel events through an open chat. The assessment aimed to determine the efficacy of Open Chat GPT in supporting accountants. Initially, two scenarios were independently addressed by experts, followed by the same scenarios being presented to open Chat GPT for resolution, and the outcomes were subsequently compared.*

Conclusion. *Companies should establish guidelines for the ethical use of open Chat GPT in accounting. While open Chat GPT can effectively assist in certain aspects of double-entry bookkeeping, it should be used judiciously and complemented with expert oversight for tasks that demand a higher level of accuracy and detail.*



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1. INTRODUCTION

This study explores the integration of OpenAI's Chat GPT in accounting, with a focus on its ethical implications. The integration of Chat GPT into the realm of accounting is a promising advancement that offers numerous advantages, such as automating time-consuming tasks, improving efficiency, and enhancing accuracy. However, this transformative technology also presents a complex landscape of ethical considerations and challenges that accounting professionals must navigate.

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The ethical approach to using Chat GPT encompasses a multifaceted strategy that includes ethical guidelines, bias mitigation, user education, and stringent security measures. It is through these measures that professionals can optimize the technology's potential while safeguarding individual and societal interests. Furthermore, addressing employment impacts necessitates reskilling, job support, entrepreneurial opportunities, social safety nets, and industry collaboration to foster a harmonious human-AI future. Security and privacy concerns are paramount, given that data entered by Chat GPT can inform product enhancements and, therefore, require careful handling. Professionals acknowledge the necessity for ongoing AI advancements but emphasize the importance of cautious experimentation, skepticism, and robust data privacy measures.

Three key research questions will guide our investigation:

1. How does integrating Chat GPT impact accounting processes?
2. How do accounting professionals perceive and address ethics when using Chat GPT?
3. Can Chat GPT effectively assist in double-entry bookkeeping accounting?

To address these questions, we will employ a methodology that gathers data from websites, specifically utilizing Google Scholar and Google Forms. Furthermore, we executed a practical assessment, utilizing an open chat format, to evaluate the effectiveness of Chat GPT in assisting with accounting entries related to X-Hotel events.

2. PROS AND CONS OF USING OPENAI'S CHAT GPT IN ACCOUNTING

The integration of Chat GPT, powered by [OpenAI \(2023\)](#), has the potential to significantly impact the accounting industry. This advanced natural language processing tool can automate numerous time-consuming tasks currently performed by accountants, potentially leading to increased efficiency, accuracy, and cost reduction for accounting firms. One notable application is automated data entry, which can free up accountants to focus on more valuable tasks like data analysis and financial planning. Chat GPT can also play a crucial role in automating auditing processes, reducing the time required for audits and enhancing their accuracy. Financial reporting stands to benefit from Chat GPT's ability to automate report generation, ensuring consistency and accuracy across all reports. Moreover, this AI tool can assist with client communication, providing instant responses and real-time support, as well as help with monitoring compliance and regulatory changes. However, alongside these advantages come challenges. Data security is a paramount concern, necessitating robust security features to safeguard sensitive financial data. Ensuring Chat GPT is trained on accurate data is another challenge to avoid incorrect conclusions and recommendations ([Holloway, 2023](#)).

In recent years, the advent of advanced language models like Chat GPT, powered by OpenAI, has ushered in a transformative era in communication. This article explores Chat GPT's profound impact on communication, emphasizing its potential to enhance efficiency, accuracy, and personalized interactions across various industries. However, this technological advancement also raises ethical concerns, particularly regarding misinformation and privacy breaches. Furthermore, the integration of Chat GPT in professional settings may lead to changes in job roles, with some tasks being automated. Nevertheless, it presents opportunities for upskilling, human-AI collaboration and focusing on higher-value tasks. A proactive approach to upskilling, emphasizing human-centric skills, can ensure a harmonious collaboration between AI and human workers ([Jaliawala, 2023](#)).

The emergence of Chat GPT, an AI-powered chatbot developed by OpenAI, has garnered significant attention due to its ability to generate human-like responses. While it has found applications in various fields, including accounting, early adopters are discovering its potential limitations, such as inaccuracies in responses and security concerns. ChatGPT's rapid growth in users showcases its versatility, from composing content to answering complex questions. In accounting, professionals have begun using it to create Excel formulas, draft marketing material, and address data-related issues. Despite its capabilities, it can produce incorrect information and introduce errors, necessitating careful verification (Kenney, 2023).

Rampton (2023) argues that Chat GPT is a revolutionary technology that can help professionals and businesses across various industries, including accounting, to enhance their work and productivity. He lists some of the benefits of Chat GPT, such as its ability to mimic human conversations, generate content, perform calculations, and provide insights. He also acknowledges some of the drawbacks of Chat GPT, such as its lack of reliability, accuracy, and ethics. He concludes that Chat GPT is a powerful tool that can be used for good or evil, depending on how it is used and regulated.

Dhanashree (2023) provides seven ways that Chat GPT can help accountants with their tasks and processes, such as processing invoices, automating data analysis, dealing with repetitive tasks, generating financial projections, creating audit reports, providing customer service, and learning new skills. She also provides some tips and examples on how to use Chat GPT effectively and efficiently. She claims that Chat GPT can transform the accounting field by making it faster and more efficient than ever before.

The study by McFarland (2023) found that Chat GPT performed better on true/false and multiple-choice questions than on short-answer questions. It also found that Chat GPT struggled with higher-order questions that required logical reasoning and factual knowledge. The study concluded that Chat GPT is not yet a reliable substitute for human accountants, but it could be a useful tool for learning and teaching accounting concepts.

Livingston (2023) argued that AI is already having a significant impact on accounting tasks, and this impact is only going to grow in the future. One of the main ways in which AI is impacting the accounting profession is by automating routine tasks. AI-powered accounting software can now perform tasks such as data entry, reconciliation, and tax preparation. This frees up accountants to focus on more complex and strategic tasks. Another way in which AI is impacting the accounting profession is by providing insights into data. AI-powered analytics tools can help accountants to identify trends, patterns, and anomalies in financial data. This information can be used to improve decision-making and to identify potential risks and opportunities.

3. UTILIZING OPENAI'S CHAT GPT IN ACCOUNTING: EXPLORING ETHICAL CONCERNS

Addressing Chat GPT's implications demands ethical guidelines, bias mitigation, user education, security measures, and workforce development (Jaliawala, 2023). Responsible navigation of challenges can optimize its potential while protecting individual and societal interests. Furthermore, addressing employment impacts requires reskilling, job support, entrepreneurial opportunities, social safety nets, and industry collaboration, fostering a harmonious human-AI future (Jaliawala, 2023).

Security and privacy concerns arise as data entered Chat GPT may inform OpenAI's product enhancements, necessitating caution (Kenney, 2023). Nonetheless, experts anticipate ongoing AI advancements, opening avenues for professionals like accountants. They stress the need for experimentation, skepticism, and robust data privacy measures when utilizing such technology (Kenney, 2023).

Some of the ethical concerns with using Chat GPT in accounting are:

- **Data privacy and security:** Chat GPT may access, store, or share sensitive and confidential data from users or clients, such as financial information, personal details, or business secrets. This may pose a risk of data breaches, leaks, or misuse, which could harm the reputation, trust, and legal compliance of the users or clients (Satterley, 2023)
- **Bias in data:** Chat GPT may generate biased or inaccurate responses based on the data it has been trained on, which may not reflect the reality or diversity of the users or clients. This may lead to unfair or misleading outcomes, such as discrimination, exclusion, or toxicity (Zhou et al., 2023a)
- **Accountability:** Chat GPT may produce errors or untruths in its responses, which may affect the quality and reliability of the accounting work. It may also be difficult to trace or verify the source or validity of the data or information used by Chat GPT. This may raise questions about who is responsible or liable for the consequences of using ChatGPT (Satterley, 2023)
- **Transparency:** Chat GPT may not disclose or explain how it generates its responses, what data or information it uses, or what assumptions or limitations it has. This may create a lack of transparency and trust between the users or clients and Chat GPT, as well as potential ethical dilemmas or conflicts of interest (Satterley, 2023).

The article (Mintz, 2023) discusses the ethical issues to consider when using Chat GPT, an artificial intelligence (AI) program that can generate natural language responses based on data. He points out that Chat GPT can help professionals and businesses across various industries, including accounting, to enhance their work and productivity, but it also poses some risks and challenges, such as data privacy and security, bias in data, accountability, and transparency. He suggests that users of Chat GPT should be respectful, avoid spreading misinformation, protect personal information, and use Chat GPT responsibly. He also recommends that users should have human oversight and review the data, test it, and implement it in a way that makes sense for their organization.

Researchers Albu and Albu (2021) examine the current and potential applications of AI in accounting and auditing, such as data analysis, fraud detection, audit quality, and decision-making. They also discuss the challenges and opportunities of AI for accounting and auditing, such as ethical, legal, social, and educational implications. They conclude that AI is a disruptive and transformative technology that can enhance the efficiency, effectiveness, and value of accounting and auditing, but it also requires careful and responsible adoption and regulation.

Zhou et al. (2023a) argued that Chat GPT is a powerful tool that has the potential to revolutionize the accountancy profession, but it is important to be aware of its limitations and to use it responsibly. One of the main concerns is the potential for job displacement. Chat GPT can perform many accounting tasks at a high level of efficiency and accuracy, and this could lead to many accountants losing their jobs. The authors argue that it is important to develop strategies for retraining and redeploying accountants who are displaced by Chat GPT. Another concern is the potential for bias. Chat GPT is trained on a massive dataset of text and code, which may contain biases. This raises concerns regarding the potential for Chat GPT to produce biased outcomes, including financial

reports that may exhibit favoritism towards specific businesses or individuals. The authors [Zhou et al. \(2023a\)](#) argue that it is important to be aware of this potential and to take steps to mitigate it, such as using multiple sources of data and having human oversight of Chat GPT's outputs.

[Rao \(2023\)](#) said that Chat GPT is not yet capable of performing accounting tasks at a level of accuracy and reliability that is required by the accounting profession. One of the main limitations of Chat GPT is its lack of understanding of accounting concepts. Chat GPT is trained on a massive dataset of text and code, but this dataset does not include a comprehensive understanding of accounting principles and procedures. This means that Chat GPT can generate incorrect or misleading results when performing accounting tasks. Another limitation of Chat GPT is its susceptibility to bias. Chat GPT is trained on a dataset that may contain biases, and this can lead to Chat GPT generating biased results.

4. DISCUSSION OF LITERATURE REVIEW – ADDRESSING THE RESEARCH QUESTIONS

Our objective is to address the two questions, drawing from the literature review.

1. *How does integrating Chat GPT impact accounting processes?*

The integration of Chat GPT, powered by OpenAI, can significantly impact accounting by automating tasks, improving efficiency, and enhancing accuracy ([Holloway, 2023](#)). Automated data entry and auditing processes are notable applications, that streamline accounting tasks ([Holloway, 2023](#)). Financial reporting benefits from Chat GPT's ability to generate consistent and accurate reports. While it offers numerous advantages, challenges include data security and the need for accurate training data ([Holloway, 2023](#)).

Chat GPT's impact extends beyond accounting. It revolutionizes communication across industries, raising ethical concerns and potential job role changes ([Jaliawala, 2023](#)).

Despite its versatility, users should exercise caution due to its limitations, including inaccuracies and security concerns ([Kenney, 2023](#)).

[Rampton \(2023\)](#) highlights Chat GPT's potential benefits and drawbacks, emphasizing the need for responsible use and regulation. [Dhanashree \(2023\)](#) identifies seven ways ChatGPT can assist accountants, in transforming the field.

[McFarland's \(2023\)](#) suggests Chat GPT's proficiency in certain question types but highlights its limitations in handling higher-order questions. [Livingston \(2023\)](#) emphasizes AI's growing impact on accounting by automating routine tasks and providing data insights.

2. *How do accounting professionals perceive and address ethics when using Chat GPT?*

Ethical guidelines and responsible usage are paramount ([Jaliawala, 2023](#)). Professionals navigate challenges by implementing bias mitigation, user education, and robust security measures. This ensures optimal utilization of Chat GPT's capabilities while safeguarding individual and societal interests.

Security and privacy concerns are crucial considerations. Data entered Chat GPT may influence OpenAI's product enhancements, necessitating cautious handling. Professionals anticipate

ongoing AI advancements and emphasize the importance of experimentation, skepticism, and robust data privacy measures when using such technology (Kenney, 2023).

The ethical concerns in accounting include data privacy and security, bias in data, accountability, and transparency. Data privacy and security are crucial as Chat GPT may access sensitive information, risking data breaches and harm to users or clients. Bias in data may lead to inaccurate outcomes and discrimination, affecting the diversity of users. Accountability challenges arise due to potential errors in responses, raising questions about responsibility. Transparency issues may create ethical dilemmas and conflicts of interest between users and Chat GPT (Satterley, 2023).

Mintz (2023) emphasizes the need for responsible use of Chat GPT, including avoiding spreading misinformation, protecting personal information, and implementing the technology with human oversight and review.

Albu and Albu (2021) discuss the potential applications of AI in accounting and auditing, highlighting ethical, legal, social, and educational implications. They stress the need for careful and responsible adoption and regulation to harness the benefits of AI.

Zhou et al. (2023b) underscore the importance of using Chat GPT responsibly, considering its limitations and potential job displacement. They advocate for strategies to retrain and redeploy displaced accountants and measures to mitigate bias.

Rao (2023) emphasizes that Chat GPT's limitations, including its lack of understanding of accounting concepts, make it not yet suitable for accounting tasks requiring a high level of accuracy and reliability.

5. METHODOLOGY – CASE STUDY UTILIZING OPEN CHAT GPT FOR DOUBLE-ENTRY ACCOUNTING

On November 23, 2023, we conducted an open chat with GPT to test its capability to assist with the accounting entries for events in the company X-Hotel. The purpose was to evaluate whether open chat GPT could help accountants. Initially, we independently solved two different scenarios as experts in the field. Subsequently, we requested open chat GPT to solve the same scenarios and compare the results.

6. CASE STUDY 1 – RECORDS OF INTANGIBLE ASSETS

A hotel company entered into a contract with a marketing agency. For this purpose, the given hotel company transferred an advance of 100,000 MKD from the funds to a transaction account. The marketing agency submits an invoice for the performed research for 80,000 MKD. The invoice was paid from the previously given advance, and the rest of the advance was returned to the transaction account of the company.

Then we prompted Chat GPT to: “Provide an example by creating a table of double-entry accounting using the following data: A hotel company entered a contract with a marketing agency. For this purpose, the given hotel company transferred an advance of 100,000 MKD from the funds to a transaction account. The marketing agency submits an invoice for the performed research for 80,000 MKD. The invoice was paid from the previously given advance, and the rest of the advance was returned to the transaction account of the company.”

Table 1. Accounting records provided by accounting expert-case study 1

Accounting records					
Number	Account		Description	Amount	
	+	-		+	-
1.	016		Advances on intangible investments	100.000	
		100	Transaction advance		100.000
1a.	010		Research and development expenditure	80.000	
		220	Obligations for suppliers in the country		80.000
1b.	100		Transaction advance	20.000	
		220	Obligations for suppliers in the country	80.000	
		016	Advances on intangible investments		100.000

Source: Author's creation

The response from Chat GPT was:

“Certainly, here is an example of a table for double-entry accounting based on the provided data: Table 2 represents the double-entry transactions for the hotel company's contract with a marketing agency. The first entry records the advance transfer from the funds to the transaction account. The second entry records the payment of the invoice using the advance. The third entry reflects the return of the remaining advance to the transaction account.”

Table 2. Accounting records provided by open CHAT GPT-case study 1

Transaction	Account	Debit (MKD)	Credit (MKD)
1	Cash/Bank (Transaction account)	100.000	
	Advance from funds		100.000
2	Marketing expense	80.000	
	Advance from funds		80.000
3	Advance from funds	20.000	
	Cash/Bank (Transaction account)		20.000

Source: Open Chat GPT

6.1. Differences: Expert Vs. Open Chat Gpt - Case Study 1

Table 2, generated by ChatGPT, and Table 1, provided by an expert, depict two distinct formats for documenting double-entry accounting transactions. Let's examine some key differences:

- **Format and Structure:**
 - Table 2 employs a tabular format with separate columns for Transaction Number, Account, Debit, and Credit.
 - Table 1 adopts a numbered list format with individual rows for each transaction, outlining the account, description, and amount in separate columns.
- **Accounting Elements:**
 - In Table 2, each transaction is bifurcated into debit and credit entries, providing a clear indication of the affected accounts.
 - Table 1 employs a more narrative style, specifying the account, description, and whether it's a debit or credit entry in separate columns.

- **Accounting Terminology:**
 - Table 2 utilizes generic terms like “Cash/Bank” and “Marketing Expense” for enhanced clarity.
 - Table 1 uses specific accounting codes (e.g., 016, 010, 220) to denote accounts, potentially part of a specific chart of accounts.
- **Explanation:**
 - Table 2 includes a brief explanation of each transaction for better comprehension.
 - Table 1 provides descriptions for each transaction, offering additional context.

Both tables serve the purpose of documenting double-entry accounting transactions, differing in format, structure, and the level of detail provided. The choice between them depends on the preferences of the accounting system or the individual maintaining the records.

7. CASE STUDY 2 – RECORD OF PROCUREMENT OF FUNDS FOR WORK

The management board of a hotel company has decided to renovate the hotel rooms. For this purpose, an agreement was concluded with the contractor for the purchase of new beds for the hotel rooms, whereby funds of 350,000 MKD were set aside from the transaction account. An invoice for the purchased equipment for 300,000 MKD was received from the supplier. An invoice for 50,000 MKD was received for the transportation of the equipment. Unloading and accommodation were paid in cash of 70,000 MKD. The invoices were paid from the allocated funds, and after the commission review, the equipment was put into use.

Table 3. Accounting records provided by accounting expert-case study 2

Accounting records					
Number	Account		Description	Amount	
	+	-		+	-
2.	101		Allocated funds	350.000	
		100	Transaction advance		350.000
2a.	025		Material assets in preparation	300.000	
		220	Obligations for suppliers in the country		300.000
2b.	025		Material assets in preparation	50.000	
		220	Obligations for suppliers in the country		50.000
2c.	025		Material assets in preparation	70.000	
		102	Cash		70.000
2d.	220		Obligations for suppliers in the country	350.000	
		101	Allocated funds		350.000
2e.	022		Hardware and tools	420.000	
		025	Material assets in preparation		420.000

Source: Author’s creation

Then we prompted ChatGPT to: “Provide an example by creating a table of double-entry accounting using the following data: “The management board of a hotel company has decided to renovate the hotel rooms. For this purpose, an agreement was concluded with the contractor for the purchase of new beds for the hotel rooms, whereby funds of 350,000 MKD were set aside from the transaction account. An invoice for the purchased equipment for 300,000 MKD was received from the supplier. An invoice for 50,000 MKD was received for the transportation of the equipment. Unloading and accommodation were paid in cash of 70,000 MKD. The invoices were paid from the allocated funds, and after the commission review the equipment was put into use.”

The response from Chat GPT was: “Certainly, here’s an example of a double-entry accounting table based on the provided data: This table represents the double-entry transactions for the hotel company’s decision to renovate the hotel rooms, including the purchase of new beds, equipment, transportation costs, and cash payments for unloading and accommodation.”

Table 4. Accounting records provided by open CHAT GPT-case study 2

Transaction	Account	Debit (MKD)	Credit (MKD)
1	Renovation Expense (new beds)	350.000	
1	Transaction Account		350.000
2	Equipment Purchase Expense	300.000	
2	Transaction Account		300.000
3	Transportation Expense	50.000	
3	Transaction Account		50.000
4	Cash	70.000	
4	Transaction Account		70.000

Source: Open Chat GPT

7.1. Differences: Expert Vs. Open Chat Gpt – Case Study 2

Let's compare Table 3 and Table 4:

- **Table Format:**
 - Table 3, provided by the accounting expert, uses a structured tabular format with separate columns for Number, Account, Description, and Amount.
 - Table 4, generated by Open ChatGPT, employs a simplified tabular format with columns for Transaction, Account, Debit (MKD), and Credit (MKD).
- **Accounting Terminology:**
 - In Table 3, specific accounting terms and codes are used, such as »Allocated funds,« »Material assets in preparation,« »Obligations for suppliers in the country,« etc.
 - Table 4 uses more generic terms like »Renovation Expense (new beds),« »Equipment Purchase Expense,« »Transportation Expense,« and »Cash.«
- **Representation of Transactions:**
 - Table 3 provides a detailed breakdown of each transaction, including separate entries for debit and credit, along with associated accounts.
 - Table 4 simplifies the representation by providing consolidated entries for each transaction, combining both debit and credit in a single row.

8. DISCUSSION OF CASE STUDIES PROVIDED BY AN EXPERT AND OPEN CHAT GPT – ADDRESSING THE RESEARCH QUESTIONS

The third research question was: *Can Chat GPT effectively assist in double-entry bookkeeping accounting?*

When comparing the outputs generated by an expert (Table 1 and Table 3) and Open Chat GPT (Table 2 and Table 4) in documenting double-entry accounting transactions, several pros and cons emerge:

Pros of Using Open Chat GPT in accounting:

- **Simplified Format:** Open ChatGPT (Table 4) uses a simplified tabular format, potentially making it more accessible to users unfamiliar with complex accounting structures.
- **Generic Terminology:** The use of more generic terms in Open ChatGPT may enhance clarity for a broader audience.
- **Consolidated Representation:** Open ChatGPT consolidates transactions into single rows, streamlining the presentation for quick comprehension.

Cons of Using open Chat GPT in accounting:

- **Lack of Detail:** Open ChatGPT provides a more condensed representation, lacking the detailed breakdown seen in the expert-provided tables (Table 1 and Table 3).
- **Potential Loss of Precision:** The generic terms used in Open ChatGPT may lack the precision of specific accounting codes, potentially leading to ambiguity.
- **Limited Explanation:** While providing consolidated entries, Open ChatGPT might lack the detailed explanations found in the expert-provided tables (Table 1 and Table 3).

The selection between employing open Chat GPT and relying on an expert in accounting documentation is contingent on the specific requirements and preferences of the user or organization. Open Chat GPT presents a more accessible and streamlined approach, whereas tables provided by experts offer a heightened level of precision and detail. The decision should be guided by the intricacy of the accounting task and the intended audience for the documentation.

9. CONCLUSION

Chat GPT can serve as a valuable tool for individuals seeking a simplified and accessible method for double-entry bookkeeping accounting. It is particularly beneficial for those prioritizing a quick overview over a detailed breakdown. However, for tasks demanding precision, in-depth analysis, or compliance with specific accounting standards, the expertise of an accounting professional may remain essential.

While ChatGPT can effectively assist in certain aspects of double-entry bookkeeping, it should be used judiciously and complemented with expert oversight for tasks that demand a higher level of accuracy and detail.

The article provides scientific added value by:

- Researching the ethical considerations and challenges that accounting professionals face when integrating Chat GPT into their practices.
- Consolidating information from various sources to offer a comprehensive overview of how these professionals perceive and address ethical concerns associated with AI technology.
- Contributing to the scientific literature by providing a nuanced understanding of the multifaceted ethical landscape in the accounting domain and highlighting the importance of responsible AI adoption.
- Synthesizing real-world insights and practical advice, making it a valuable resource for researchers and professionals seeking to navigate the complex intersection of AI and ethics in accounting.

The article provides practical implications:

- We showcase the unique and practical value of Open Chat GPT in accounting through two distinct usage scenarios.

- Ethical guidelines: Accounting firms and professional organizations should develop and implement clear ethical guidelines for using AI in accounting to ensure responsible AI adoption.
- Security measures: Accounting professionals should focus on implementing robust security measures to safeguard sensitive financial data, such as encryption, access controls, and data protection protocols.
- Bias mitigation: Accounting professionals should actively assess and adjust AI models to reduce biases, ensuring fair and accurate outcomes.
- User education: Accounting professionals should promote user education and awareness by investing in training and education programs to ensure that individuals using AI tools understand their capabilities and limitations.

Limitations:

The field of AI and ethics is constantly evolving. The article may become outdated as new technologies and ethical frameworks emerge. The legal and regulatory landscape for data privacy varies globally. The article does not provide an exhaustive analysis of how different jurisdictions address data privacy concerns. Our scope was constrained solely to Open Chat GPT.

Future research:

The article suggests that future research should concentrate on comprehending the long-term effects of AI on accounting ethics, exploring how ethical considerations differ across cultures, assessing the influence of AI on accounting education, and formulating AI ethics frameworks tailored to the accounting profession. Additionally, it is recommended for future studies to conduct case analyses, incorporating Bard and Bing AI tools, and comparing the usage of all three tools in the context of accounting.

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Sustainability Pillars and ISO Standards: The Case of Serbia

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Abstract: *Economic, environmental and social pillars of sustainable development are directly related to ISO standards. Organizations are aware that international standards provide effective tools that will help them cope with the challenges of the modern business world. In Serbia, the pillars of sustainable development are connected to ISO standards in the following way - the economic pillar is directly connected to standardization by ISO 9001 and ISO 31000, the ecological pillar with ISO 14001, and the social pillar with ISO 45001 and ISO 26000. This paper aims to indicate the state of standardization in the areas of sustainable development in Serbia, placing special emphasis on ISO 9001 and ISO 14001 standards. The final result of this manuscript would be that all interested parties (individuals, state and private institutions, government, etc.) have to work together to realize the goals of sustainable development, using the ISO standards tools.*

1. INTRODUCTION

With the aim of understanding the concept of sustainable development (SD), it is important to refer to the concepts of economic growth and economic development. Economic growth is closely related to the wealth of the nation because it is of the greatest importance for the standard of living and the quality of life of the people of a country. Economic growth is equally important for all countries of the world, but it is of particular importance for those countries that are poor and still have poor living conditions. On the other hand, economic development is a broader concept than the concept of economic growth because, in addition to economic growth (changes in the volume of production, i.e. quantitative changes), it also includes a large number of qualitative changes (complex transformations in the structure of the economy), such as the application of modern techniques and technology in production, development of science, healthcare, educational system, increasing the use of machine work in relation to human work in the production process, etc. Thus, economic development is a complex phenomenon and is influenced by a large number of factors. There are a large number of such factors nowadays, and the following factors stand out as some of the factors that have the strongest influence on economic development (Ekonomski leksikon, 1975):

- accumulation capacity of a country's economy,
- structure of new investments,
- the pace of application of technical and technological progress,
- the size of the labor supply, as well as its qualification level,
- development management methods, as well as the character of the political system (the relationship between economics and politics).

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Economic development is extended primarily by the ecological, and then by the economic and social dimensions, therefore it is considered a broader term than the term economic growth (Pavlović, 2022). SD is a new development concept that requires an integrated approach so that in addition to economic and social development, it also takes into account the environmental component of that development. The United Nations Commission, headed at that moment by the Prime Minister of Swedish origin, Gro Harlem Brundtland, saw the necessity of respecting ecological criteria at all levels of development, thus, in 1987 defined sustainable development as meeting the needs of the present generation without jeopardizing the ability of future generations to meet their own needs, because future generations do not have the right to vote in the creation of policies at the present moment (Brundtland, 1987).

SD is linked to ISO standards through all three pillars of sustainability. Thus, according to the International Organization for Standardization (ISO) (2019), „ISO 9001 is a standard that sets out the requirements for a quality management system, and it helps businesses and organizations to be more efficient and improve customer satisfaction“ (p. 2). ISO 9001 (Quality Management System) has its new version ISO 9001:2015 which replaces the old version ISO 9001:2008. According to ISO (2018), „ISO 31000 provides direction on how companies can integrate risk-based decision making into an organization’s governance, planning, management, reporting, policies, values and culture“ (p. 2). ISO 31000 is related to Risk management, and it is suitable for all types of organizations regardless of their size, type, or location, and covers all types of risks. These two standards are deeply integrated into the economic pillar of SD. Furthermore, according to ISO (2015), „ISO 14001 is an internationally agreed standard that sets out the requirements for an environmental management system“, (p. 2). ISO 14001 (Environmental Management System) helps organizations improve their environmental performance. This standard is integrated into the environmental pillar of SD. According to ISO (2018), „ISO 45001 – Occupational Health and Safety Management Systems – Requirements with guidance for use, is the world’s first International Standard for Occupational Health and Safety (OH&S)“, (p. 2). This standard provides a framework to increase safety at workplace and well-being and health at work and to reduce workplace risks. According to ISO (2018), „One of the overarching standards directed at helping businesses and organizations contribute to sustainable development is ISO 26000, Guidance on social responsibility“, (p. 3). These two standards are deeply integrated into the social pillar of SD.

This paper is structured as follows: section two – previous research; section three – participation of standards in SD; section four – participation of standards in SD of Serbia; section five – conclusion.

This paper aims to indicate the state of standardization in the areas of SD in Serbia, placing special emphasis on ISO 9001 and ISO 14001 standards.

2. PREVIOUS RESEARCH

A group of authors (Zimon et al., 2020) investigated the impact of ISO 9001 and ISO 14001 on sustainable supply chain management in the textile industry. Research has revealed that there is a more significant supply chain impact with the implementation of both standards compared to either standard alone. Furthermore, another group of authors (Schulte et al., 2020) was engaged in sustainability risk management analysis in product development companies. The authors conducted interviews with industry and academic experts, thus, they identified 21 key aspects of sustainability risk management. Based on these results, as well as based on research in the field of transition

design, sustainability risk management and strategic sustainable development, the authors presented a conceptual approach for managing strategic risks within the sustainability transition, thus, risks can then be identified and managed in the right way. [Trifonov et al. \(2022\)](#) found that “there is a need for careful regulation of the processes of creating and reformatting risk management subsystems, taking into account compliance with the principles of sustainable development”. [Ceko \(2023\)](#) analyzed the impact of ISO standards in general on SD. The author concluded that there is a strong relation between SD goals index and ISO 9001 index, as well as that all interested parties (individuals, civil society, public and private institutions, decision-makers, etc.) should look forward in order to make relations and connections between SDG and ISO standards. A group of domestic authors ([Lalić et al., 2017](#)) dealt with the issue of key competence factors of Serbian organizations with certified management systems. The study revealed that there is a significant difference between certified and non-certified companies, in terms of the quality of products and services, thus, the implementation of a quality management system in business is of great importance for SD. Another group of authors ([Horry et al., 2022](#)) dealt with the issue of environmental management systems in the field of architecture, engineering, and construction (AEC), but also the issue of SD in terms of AEC. This study generated a wide range of benefits to support the implementation of ISO 14001 in AEC sectors, while using ISO 14001 as a framework would certainly help companies focus on achieving SD goals. [Toppinen et al. \(2019\)](#) found that “ISO 26000 standard may bring some added value to especially medium-scale companies with less sophisticated social responsibility processes, though it is not sufficiently detailed to incorporate any sector-specific issues”.

3. PARTICIPATION OF STANDARDS IN SD

There are 17 SD goals nowadays, and ISO standards participate in them. The following table (table 1) represents participation of ISO 9001 standard in the SD goals.

Table 1. Participation of ISO 9001 in the SD goals

ISO 9001:2015
Goal 1 – No poverty
Goal 9 – Industry, innovation and infrastructure
Goal 12 – Responsible consumption and production
Goal 14 – Life below water

Source: [International Organization for Standardization, n.d.](#)

Table 2 shows the participation of ISO 14001 standard in the SD goals.

Table 2. Participation of ISO 14001 in the SD goals

ISO 14001:2015
Goal 1 – No poverty
Goal 2 – Zero hunger
Goal 3 – Good health and well-being
Goal 4 – Quality education
Goal 6 – Clean water and sanitation
Goal 7 – Affordable and clean energy
Goal 8 – Decent work and economic growth
Goal 9 – Industry, innovation and infrastructure
Goal 12 – Responsible consumption and production
Goal 13 – Climate action
Goal 14 – Life below water
Goal 15 – Life on land

Source: [International Organization for Standardization, n.d.](#)

Table 3 shows the participation of ISO 31000 standards in the SD goals.

Table 3. Participation of ISO 31000 in the SD goals

ISO 31000:2018
Goal 3 – Good health and well-being
Goal 8 – Decent work and economic growth
Goal 9 – Industry, innovation and infrastructure
Goal 11 – Sustainable cities and communities
Goal 14 – Life below water
Goal 15 – Life on land
Goal 16 – Peace, justice and strong institution

Source: International Organization for Standardization, n.d.

Table 4 shows the participation of ISO 45001 standards in the SD goals.

Table 4. Participation of ISO 45001 in the SD goals

ISO 45001:2018
Goal 3 – Good health and well-being
Goal 5 – Gender equality
Goal 8 – Decent work and economic growth
Goal 9 – Industry, innovation and infrastructure
Goal 10 – Reduced inequalities
Goal 11 – Sustainable cities and communities
Goal 16 – Peace, justice and strong institutions

Source: International Organization for Standardization, n.d.

Table 5 shows the participation of ISO 26000 standards in the SD goals.

Table 5. Participation of ISO 26000 in the SD goals

ISO 26000:2010
Goal 1 – No poverty
Goal 2 – Zero hunger
Goal 3 – Good health and well-being
Goal 4 – Quality education
Goal 5 – Gender equality
Goal 6 – Clean water and sanitation
Goal 7 – Affordable and clean energy
Goal 8 – Decent work and economic growth
Goal 9 – Industry, innovation and infrastructure
Goal 10 – Reduced inequalities
Goal 11 – Sustainable cities and communities
Goal 12 – Responsible consumption and production
Goal 13 – Climate action
Goal 14 – Life below water
Goal 15 – Life on land
Goal 16 – Peace, justice and strong institutions

Source: International Organization for Standardization, n.d.

From the tables above, it can be concluded that the ISO 26000 standard participates in all the goals of SD, except for goal 17 (Partnerships for the goals). Then, ISO 14001 participates in most of the SD goals (except in 5th, 10th, 11th, 16th and 17th). Furthermore, ISO 31000 and 45001 standards participate solidly in the goals of SD, i.e. in some of the goals, while ISO 9001 participates only in the 1st, 9th, 12th and 14th goals of SD.

Figure 1 represents the number of ISO standards that apply to each goal of SD.

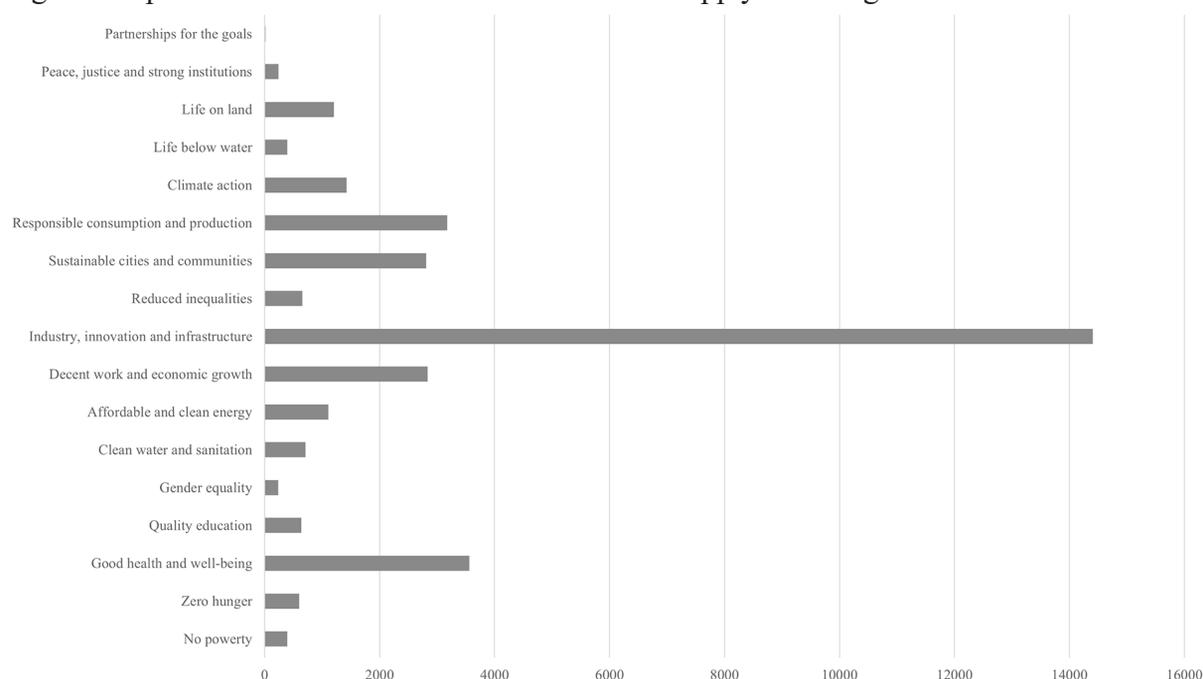


Figure 1. The number of ISO standards that apply to each goal of SD

Source: International Organization for Standardization, n.d.

4. PARTICIPATION OF STANDARDS IN SD OF SERBIA

Since Serbia is still a country in the transition process, it is necessary to adopt internationally recognized ISO standards, especially ISO 9001 and ISO 14001, i.e. Quality Management System – QMS, and Environmental Management System – EMS.

Thus, Table 6 shows the number of ISO certificates in Serbia, from 2013 – 2022.

Table 6. The number of ISO certificates in Serbia, from 2013 to 2022

Year	ISO 9001 certificates	ISO 14001 certificates
2013	2366	762
2014	2637	901
2015	2512	1120
2016	3017	1139
2017	2213	887
2018	2427	1169
2019	2707	1275
2020	3092	1629
2021	3461	1794
2022	3541	1921

Source: International Organization for Standardization, n.d.

It is possible to notice that the number of EMS certificates is significantly lower compared to the number of QMS certificates in Serbia in the observed period, which indicates that the competent authorities have to work on raising awareness of the importance of introducing EMS into the business policy of organizations throughout the country.

5. CONCLUSION

Although the situation in Serbia regarding the implementation of ISO standards has significantly improved in recent years and companies are increasingly becoming socially responsible, there is still insufficient awareness of the importance of EMS implementation, i.e. of the ISO 14001 standard in the operations of Serbian companies. This may be related to the fact that the Balkans, and therefore Serbia as a part of the Balkans, is a “pollution heaven” brought by foreign investors who are very attracted to the countries of the Balkans due to cheap labor and weak environmental legislation.

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Economic Growth, Energy Consumption and CO₂ Emissions in the European Union. A Panel Data Analysis

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Abstract: *This study focuses on the impact of economic growth and energy consumption on carbon dioxide emissions. The analysis is based on panel data for the 27 member countries of the European Union for the period 2012-2021. The results show that there is a statistically significant relationship between real GDP, energy consumption and carbon dioxide emissions for the EU member states.*

Generally speaking, the researched relationship shows that in the last decade in the EU, successful policies have been implemented to increase the green balance between economic growth and harmful emissions in the air. It should be taken into account that the need for the implementation of the circular economy is increasing since the green measures are not applied equally in each of the countries studied.

1. INTRODUCTION

Among the most discussed topics in modern reality is that of the green economy. The world of science and technology meet to produce values that would give a new reality to the life of the planet. In society, the green economy is associated with words such as future, growth, and cleanliness. This modern reading of economics is launched, both in modern scientific achievements, among political discussions and timely measures, and the builders and innovators of modern technology. The ecological well-being of the planet and the engagement of social society for a greener future becomes the goal. This mission succeeds in provoking investors, governments and various organizations to join forces for innovative sustainable solutions. According to [UNEP \(1998\)](#), *Greater efficiency in the use of energy, water, and materials is a core objective* (p. 4). Nature conservation and pollution reduction are one of the main problems of the future.

Air pollution is one of the main challenges facing humanity. [Brunekreef and Holgate \(2002\)](#) found *the health effects of air pollution have been subject to intense study*. (p.1233) The industrial production, transport, some of the technologies of the new age and others cause air pollution. This in turn leads to *adverse effects on human health and the environment* ([Kampa & Castanas, 2008, p. 362](#)). At high levels of air pollution *major impairments of different organs can be observed* ([Kampa & Castanas, 2008, p. 366](#)). Clean air is a prerequisite for a green world and sustainable development.

2. THEORETICAL AND EMPIRICAL CONSIDERATIONS

The European Union has undergone major economic and social changes over the past decades. Many layers were moved and the focus turned to environmental changes and how to successfully operate the economy so that a green balance is maintained and a transition from a linear

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to a circular economy. According to [Ivanova and Chipeva \(2019\)](#), *The transition towards a circular economy requires fundamental changes to production and consumption systems, going well beyond resource efficiency and recycling waste* (p. 700). The governments of the member countries are united by the idea of introducing arrangements, called by [Zhang et al. \(2013\)](#) *serial of environmental management systems* (p. 260). According to [Copeland and Taylor \(2004\)](#), *there has been a flurry of recent empirical work linking economic growth to environmental outcomes* (p. 22). [Payne \(2010\)](#) found that *understanding the impact of energy consumption on economic growth is an important consideration in the formulation of both energy and environmental policies* (p. 86).

The Kuznets curve is an invariable method of economic growth, and its basis is the statement that *upper-income shares-increasing as a country moves to higher economic levels* ([Kuznets, 1955, p. 9](#)). Over time, a modification of the curve has emerged and the green economy finds its place in the general idea as environmental Kuznets curve EKC. According to [Kais and Sami \(2016\)](#), *The EKC hypothesis assumes that the environmental quality first deteriorates until a certain level of income is reached and then improves as economic development proceeds* (p. 1101). Examining the relationship between economic growth and carbon dioxide is becoming an integral part of tracking the green economy.

At [Bengochea-Morancho et al. \(2000\)](#) a study was presented using panel data analysis of countries in the European Union. An econometric model is estimated by *taking GDP as an independent variable and CO₂ emissions as a dependent variable*. (p. 171). The study is based on the fixed-effects model. The analysis shows different behavior of richer and poorer countries. According to [Zhang et al. \(2013\)](#), it was established that *the Impact of air emissions does not increase with the economy of China* (p. 267). According to [Arouri et al. \(2012\)](#) for the Middle East and North African countries was established through panel data analysis that *in the long-run energy consumption has a positive significant impact on CO₂ emissions in MENA region. More interestingly, we show that real GDP exhibits a quadratic relationship with CO₂ emissions. Taken together, our findings support an inverted U-shape pattern associated with the Environmental Kuznets Curve hypothesis for the MENA region: CO₂ emissions increase with real GDP, stabilize, and then decrease*. (p. 347). [Kasperowicz \(2015\)](#) found with the help of panel data analysis, for 18 of the member countries of the European Union that *the long-run equation indicated that the CO₂ emissions are negatively related to the economic growth* (p. 347) for the period 1995-2012.

[Mikayilov et al. \(2018\)](#) established that *economic growth has a positive and statistically significant impact on carbon emissions in the long run*. (p. 1566) in Azerbaijan. According to [Andronicianu and Georgescu \(2023\)](#), it is established, again, that *is proved a long-run and a short-run causality of all three regressors on economic growth* (p. 1566) on a panel of 25 EU member states, which examined the relationship between CO₂ emissions, energy consumption and FDIs on economic growth.

3. METHODS

3.1. Data

The analysis used data from EUROSTAT for the period 2012-2021.

- i. Annual data for „Air emissions accounts by NACE“- Carbon dioxide [EUROSTAT \(2022\)](#). The unit measure is a tonne. The data will present the harmful air emissions.

- ii. Annual data for „Gross domestic product at market prices“chain-linked volumes (2010), which is calculated with deflator for 2010 **EUROSTAT (2022)**The unit measure is in million euro.
- iii. Annual data for „Primary energy consumption “ *The indicator measures the total energy needs of a country excluding all non-energy use of energy carriers (e.g. natural gas used not for combustion but for producing chemicals). “Primary Energy Consumption” covers the energy consumption by end users such as industry, transport, households, services and agriculture, plus energy consumption of the energy sector itself for production and transformation of energies, losses occurring during the transformation of energies (e.g. the efficiency of electricity production from combustible fuels) and the transmission and distribution losses of energy).* **EUROSTAT (2022)** The unit measures a million tonnes of oil equivalent.
- iv. Annual data for „Final energy consumption“. *The indicator measures the energy end-use in a country excluding all non-energy use of energy carriers (e.g. natural gas used not for combustion but for producing chemicals). “Final energy consumption” only covers the energy consumed by end users, such as industry, transport, households, services and agriculture; it excludes energy consumption of the energy sector itself and losses occurring during the transformation and distribution of energy.* **EUROSTAT (2022)** The unit measures a million tonnes of oil equivalent.

3.2. Instruments

Growth rates for Carbon dioxide

Growth rates characterize the relative increase in the absolute volume of the studied phenomenon during the current period compared to a previous period. (Atanasov, 2018, p. 44),

$$d_{t/t-1(\%)} = \left(\frac{Y_t}{Y_{t-1}} - 1 \right) 100 = \left(\frac{Y_t - Y_{t-1}}{Y_{t-1}} \right) 100 \quad (1)$$

$d_{t/t-1(\%)}$ – Growth rates in %

Y_t – Carbon dioxide for the current year

Y_{t-1} – Carbon dioxide for the previous year

Fixed effect model

The relationship between the variables is investigated using, characteristic of panel data, Fixed effect model. The equation for the fixed effects model is:

$$Y_{it} = \beta_0 + \beta_1 X_{1,it} + \dots + \beta_k X_{k,it} + u_i + \varepsilon_{it} \quad (2)$$

Y_{it} – dependent variable (i = entity and t = time)

$X_{k,it}$ – independent variables (i = entity and t = time)

β_k – coefficient

u_{it} – is the error term (the effect of country and years)

ε_{it} – residual error

4. STATISTICAL ANALYSIS

4.1. Descriptive Analysis

Figure 1 shows the growth rates of Carbon dioxide in the air for the period 2013-2021 of the member countries of the European Union - in total for all 27 countries.

The growth rate in 2013 was -3.59%, which means that carbon dioxide emissions in 2013 decreased by 3.59% compared to 2012 on average for EU member states. In 2014, emissions decreased by 4.06% compared to 2013 for the EU. In 2015, there was an increase in CO₂ compared to 2014. While, in 2016, there was again a decrease in emissions by 0.18%. In 2017, there was an increase in carbon dioxide in the air by 1.7% compared to the previous year, and in 2018 there was a decrease in emissions by 1.7%. In 2019, there was again a decrease in carbon emissions by 5.28% compared to 2018. In 2020, the largest decrease in CO₂ emissions for the researched period was observed by 12.35%. As in 2021 there is an increase of carbon dioxide in the air for the whole EU by 6.06%.

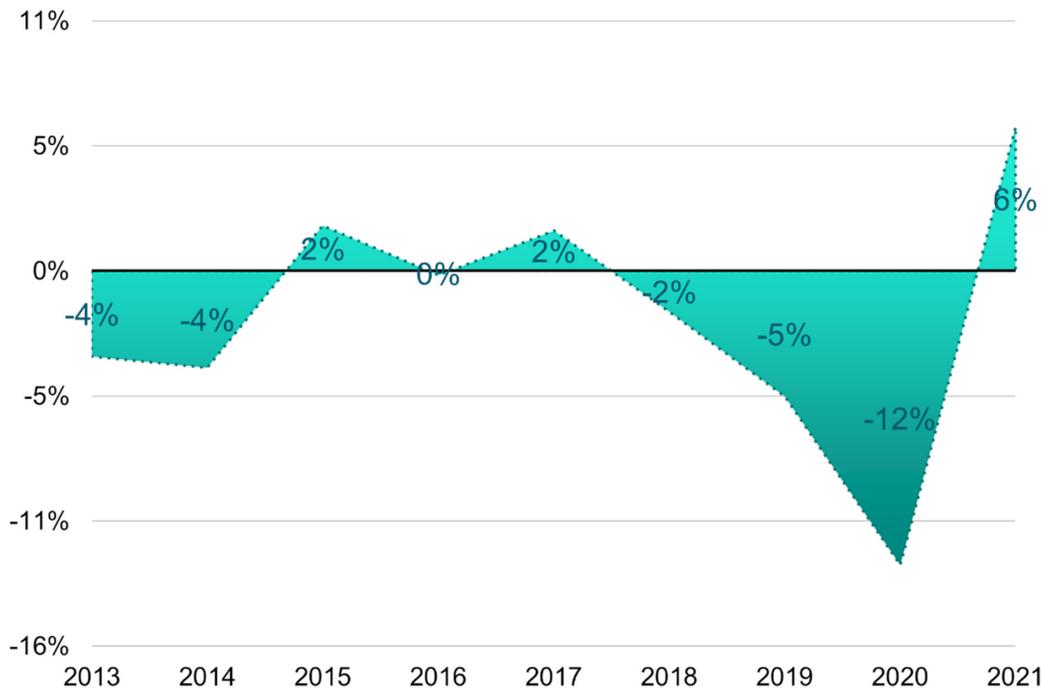


Figure 1. Growth rate for Carbon dioxide of EU 2013-2021

Source: Own research

a. Air emission and economic growth. A panel data analysis

It evaluated the model with Fixed effects and the model with Random effects. The fixed-effects model was selected as the best model. The verification was performed with the Hausman test. During the diagnostics, heteroscedasticity was found. This required the model to be re-estimated with robust standard errors. Dummy variables are created for the selected model:

- i. for time - variables for time take into account the influence of each of the studied years on the model;
- ii. for place - dummy variables for place take into account the influence of each of the countries included in the research.

This method is usually called the dummy variable regression (Wooldridge, 2009).

The inclusion of dummy variables for years and countries controls for the panel nature of the data. The specification of the selected model has the following form:

$$CD_{ct} = \beta_0 + \beta_1 GDP_{r_{ct}} + \beta_2 PEC_{ct} + \beta_3 FEC_{ct} + \sum_{r=2}^{25} \delta_r DC_{rt} + \sum_{s=2}^{10} \lambda_s DT_{ct} + \varepsilon_{ct} \quad (3)$$

Table 1. Results of the panel model

Variables	Characteristic	Model results
Constant	Coefficient (β_0)	-248203000000
GDP _r	Coefficient (β_1)	-47,8658
	Standard error	12
	t-test	-3,931
	p-value	0,001
PEC	Coefficient (β_2)	4314890
	Standard error	979280
	t-test	4
	p-value	0
FEC	Coefficient (β_3)	-276175000000
	Standard error	978591
	t-test	-2,822
	p-value	0,009

Source: Own research

The delta coefficients measure the fixed effects for the countries (without one chosen for the reference unit) and the lambda coefficients measure the fixed effects for the years (excluding $t = -1$). The results of the model are presented using specialized econometric software (Gretl).

The Student's tests on the parameters β_1 , β_2 and β_3 suggest that these three regression coefficients of the equation are statistically significant due to the fact that $\text{Sig}(t) < \alpha = 0.05$. The parameter β_0 is the constant. The parameter β_1 is Real Gross Domestic Product. β_2 coefficient is Primary energy consumption. β_3 coefficient is Final energy consumption.

From the obtained results, the following conclusion can be drawn for the period 2012-2022:

- i. per unit higher level of annual economic growth (represented by the variable Real Gross Domestic Product), air emissions (represented by carbon dioxide) decrease by an average of 147.9 tons per year.
- ii. per unit (one million tons of oil equivalent) higher level of primary energy consumption, air emissions (represented by carbon dioxide) increase by an average of 4,315 million tons per year.
- iii. per unit (one million tons of oil equivalent) higher level of final energy consumption, air emissions (represented by carbon dioxide) increase by an average of 0,979 million tons per year.

5. CONCLUSION

The presented empirical results are indicative of the objectively existing correlation between carbon dioxide emissions in the air and GDP and between carbon dioxide emissions and energy consumption for the member states of the European Union during the period 2012-2021. Economic growth undoubtedly has a major impact on the levels of harmful emissions in the air. The higher the levels of development of economic growth, the more the harmful emissions in the air decrease.

The established relationship is indicative of the favorable influence of the introduction of the green economy in recent years. The levels of the growth rates of carbon dioxide show a multifold decrease in harmful emissions in the air in recent years. Despite the positive influence, there is the question of the inequality of the EU member states in terms of the introduction of the circular economy and harmful emissions into the air. Whether member states are converging in terms of carbon dioxide levels in the air or whether there are large differences between them would be a subject of future research.

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Business Transformations through the Application of the Circular Economy

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Abstract: *The application of the circular economy contributes to multiplying the effects of business operations. Its influence is taken into account both on the value of products, materials and resources, which is preserved as long as possible in the economic cycle, as well as on the sustainability of production and consumption. In the long term, the effects of a circular economy manifest as a preserved environment, competitiveness in the European market, new jobs, and sustainable growth. At the company level, the circular economy contributes to the development of a new, innovative economic model based on reuse, recycling, repair, redevelopment, reduction of raw material use and landfilling. The report examines the relationship between industrial symbiosis and the circular economy, as well as the business models and benefits of applying the circular economy, primarily to achieve sustainable development.*

1. INTRODUCTION

In our days the majority leading in economic attitude countries in the world and private companies operating globally are aware of the necessity of implementation on transition from linear to circular economic model and put the achievement on this one purpose like priority in applied policies for the economic you are development. First of all, it brought out the need for changes in the classic economic model built on the concept of “take, make, use and throw away” to the cyclical model.

The circular economy is the new approach that unites economic growth and conservation of the environment. This is a foundational model of everything on the principles of elimination of waste and pollution, preservation of products and materials in use, and recovery of the natural systems.

The main goal of this article is to consider the concept of the circular economy as a generator of changes (transformations) in business that will contribute to economic, social, and societal benefits.

2. THE CIRCULAR ECONOMY EFFECT AND BUSINESS TRANSFORMATIONS

A leading objective of the circular economy is to preserve the value of products, materials, and resources as long as possible in the economic cycle, which will lead to sustainability in production and consumption, and hence to a preserved environment, competitiveness in the European market, new jobs and sustainable growth. The business transformed through the circular economy develops a new, innovative model of the economy based on reuse, recycling, repair, redevelopment, reduction of the use of raw materials, and waste disposal.

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The approaches of the circular flow of materials as an economic model (in the conditions of limited raw materials) serve as a prerequisite for applying the concepts of industrial ecology, industrial symbiosis and green economy. Many authors consider the circular economy as a key section of the green economy, as it deals with the management and prevention of waste production and raw material efficiency, while the green economy is a broader concept that also includes the social aspect of impact on society and ecosystem sustainability (European Parliament Science Advisory Council, 2015).

The concept of circular economy was presented for the first time in 1989 by two British economists - David Pearce and Prof. Kerry Turner. In the book “Environmental and Natural Resource Economics” (Pearce & Turner, 1990) they point out that the traditional economy that has been created is “open-ended” without any tendency towards reuse. The concept of traditional economics is underpinned by the view that nature is treated as an exhaustible resource.

The figurative representation of the circular economy illustrates the commonly accepted notion of the concept, where the recycling model creates systems of production and consumption where everything previously considered waste is put to other uses. According to a study by Lacy and Rutqvist (2015), the estimated profit from the implementation of circular economy principles in business models will reach a global scale of 4.5 trillion dollars in 2050.

The circular economy offers an alternative model where the usefulness of products, materials, and resources is extended as much as possible and waste is reduced or even eliminated. By “closing the loop”, the circular economy marks development within the world’s limited material resources. Many studies have appeared that are in the direction of green and specific problems in the circular economy (Turlakova, 2019), cleaner production (Deng et al., 2020), the low-carbon economy (Wiśniewski & Kistowski, 2018), the sharing economy (Gerwe & Silva, 2020) and hypercyclical economics (HE) (Zhang, 2017; Zhang, 2022).

The transition to such an economy involves a wide range of activities/sectors – mobility and transport, agriculture, land use and waste management, business development and consumer education – affecting almost all social strata and levels of government. This transition, however, is not something that any given institution or company can achieve on its own. Interconnection and interaction between stakeholders and sectors is required.

Four areas stand out in which the most significant benefits of the transition to a circular economy are observed - the use of resources, the environment, and economic and social aspects (the creation of new jobs, for example).

The circular economy can increase efficiency in the use of primary raw materials in Europe and the world by conserving materials incorporated into high-value products or by returning waste to the economy as high-quality secondary raw materials. This will help to reduce the dependence of European countries on imports from other countries.

In this way, supply chains in many sectors will not be affected by the volatility of international commodity markets and the uncertainty of supply due to shortages and/or geopolitical factors.

Between 6 and 12% of the consumption of all materials, including fossil fuels, is currently avoided as a result of recycling, waste reduction and eco-design policies. The maximum that can be

achieved with existing technologies is 10-17%, and by using innovative technologies and improving resource efficiency, the input raw materials used in the EU can be reduced by 24% by 2030.

The absolute decoupling of production and social welfare from the use of resources and energy and their associated environmental impacts is the main objective of the EU's resource efficiency policy.

Indeed, although current waste policies already contribute to this, the [European Commission \(2018\)](#) believes that various combinations of more ambitious recycling targets for household and packaging waste, as well as reducing landfills, could lead to a reduction in greenhouse gas emissions by around 424-617 million tonnes of carbon dioxide equivalent over the period 2015-2035, in addition to reductions resulting from existing targets in place.

The implementation of measures other than those for waste recycling could further reduce greenhouse gas emissions. It has been found, for example, that in the food and beverage, metal products, hotel and restaurant sectors, 100-200 million tonnes of carbon dioxide equivalent greenhouse gas emissions can be avoided annually by introducing measures related to the efficient use of resources.

2016 survey by the European Environment Agency indicates the following benefits of implementing a circular economy ([Gallucci et al., 2018](#)):

- Improved resource security and reduced dependence on imports (due to reduced resource demand/consumption);
- Reduced negative impact on the environment, including a drastic reduction in greenhouse gas emissions;
- Economic benefits: new niches for growth and innovation, and economies realized as a result of more effective and efficient use of resources;
- Social benefits - from the creation of new jobs to changes in consumer behavior, incl. leading to a healthier and safer lifestyle.

The application of the circular economy can be realized through different cycles that predetermine regional and company business models:

- the cascade cycle: it connects different companies to local platforms, so that waste from one company becomes raw materials for the production of other products. For this reason, it is good to work with shorter life cycles to more quickly recover the costs of collection, processing and return of products;
- a multiplying cycle through which the product remains in use for a longer time, with more cycles of use, including reuse, repair and maintenance.

Recent studies on the topic of business transformation also discuss the links between industrial symbiosis and the circular economy. Industrial symbiosis can be defined as the exchange of materials or waste between different companies. In this way, one company's waste can become another company's materials. For this reason, the European Environment Agency has determined that industrial symbiosis can be the main business model to reach a circular economy. The agency believes that the industrial symbiosis and innovative approach and business model through which we would get one step closer to the circular economy.

Based on the cascading cycle, regional models of a circular economy arise, since different regional factors predetermine the development of different business directions, which, through

the interrelationship between companies, build a kind of business network. For example, in the North-Eastern region of Bulgaria, the symbiosis of agriculture-industry-agriculture is observed. It is expressed in the use of waste from sunflower production to obtain so-called sunflower pellets, which in turn serve as raw material for heating greenhouse production.

3. REGIONAL PRINCIPLES OF APPLICATION OF CIRCULAR ECONOMY MODEL

The circular economy in a regional plan is based on the specific and characteristic features of each area. In the mountainous regions, there are significant opportunities for symbiosis between the agrarian and forest sectors. In the plains, the symbiosis between the agrarian and industrial sectors is more prominent, as well as between the forest and industrial sectors. For example, cascading cycles can give rise to regional models of the circular economy. Various regional factors determine the development of different business directions, which, through the interrelationship between companies, build unique business networks. In the Northeast region of Bulgaria, the agriculture-industry-agriculture symbiosis is evident. This is expressed in the use of waste from sunflower production to create sunflower pellets, which in turn serve as raw material for heating in greenhouse production.

In the areas of Rhodopes, Rila, and Pirin, forest materials are primarily used in the furniture production, construction, and industrial sectors. After wooden furniture, joinery boards, and wooden boards in the building sector and industry are used and worn, they are successfully recycled to produce wooden pellets. The models here follow the forest sector-industry-energy efficiency or forest sector-construction sector-energy efficiency pathways.

A cascading circular economy cycle is applied in grain production in Bulgaria. It is estimated that about 70% of the world's population consumes wheat bread, and in Bulgaria, this percentage is even higher.

The utilization of straw from cultivated wheat crops presents an excellent opportunity to create a circular economy model. Besides being used as hay for animal feed, straw can also serve as bedding for animals. However, the best and most recent application (in the last 15 years) has been the production of straw pellets. When agricultural producers who annually grow cereal crops such as wheat, oats, and rye produce their straw pellets, they can utilize specific quantities of straw effectively and become practically independent of the raw material market for their production.

The establishment of pellet production from straw and other raw materials of vegetable and fodder origin from annual crops is similar to the granulation of wood into wood pellets. Concrete advantages and disadvantages of straw and wood pellets can be described as follows:

- Wood pellets: have a higher calorific value; higher specific gravity; and higher market price.
- Straw pellets: more available raw material; lower cost of raw material for production; utilization of waste product; less financial means for building the production itself; greater stability in providing materials for pellet production; the possibility of dual use, the use also as fodder.

The financial costs of investment in machinery and equipment in the production of straw pellets are significantly lower than the same indicator in the construction of installations for the production of wood pellets.

Another plus in the production of straw pellets is the possibility to avoid the coarse crushing that is inevitable with wood, as well as the drying process, in case the straw has a moisture

content below 15-16%. Otherwise, the straw must be dried and this makes the investment itself more expensive.

It is important to know that in the production of pellets from straw, the investments in machines can be significantly reduced when producing the same burning capacity of wood versus wheat pellets. It is economically expedient to produce straw pellets for own needs, especially when closing the circular model of utilization of waste raw materials in the company. In this case, the investment is fully justified and economically profitable.

The possibility of securing the raw material at a lower price and even with a zero price under the condition of production of the main crop wheat is a prerequisite for the formation of much lower capital costs, which ultimately makes them competitive and preferred, as an opportunity to close circular model in the agricultural sector. Logging and rhythmic supplies of wood for processing into pellets are at higher prices than wheat straw, or other agricultural grains or oilseeds.

Wood pellets are more common in Bulgaria and Europe, but in Western Europe and the USA, there is ongoing research and proposals for producing pellets from agricultural raw materials and their utilization through a circular closed-system model. Such raw materials include lavender stalks, sunflower stalks, corn, rapeseed, and others, with the main raw materials being straw obtained from the cultivation of soft and hard wheat.

One of the advantages of straw as a raw material for the production of pellets and feed is that, in addition to being an energy source, it can also serve as an ingredient in granular feed for large equine animals (e.g. dairy cows, etc.). Straw pellets are used more and more widely in Western Europe, Canada and the USA and as a soft bedding when raising animals in closed rooms, such as stables, cow farms, poultry farms, pig farms and others. In Bulgaria, there are already companies that offer systems for the production of pellets (granules) from straw and other annual crops with a capacity of 0.6 - 3 tons/hour. Such companies are Radvilishkis Machinery Plant JSC, which offers straw crushing and granulation machines ŠSGL-1, granule presses OGM-1,5A; company Eco Yunan Pellets; AYA-OOD-Dobrich-Line for the production of pellets, company Geston, which mainly sells machines for pellets and granules, etc.

A study by researchers (Gorcheva et al., 2021) on the application of good practices among businesses with different fields of activity in the direction of transformation towards a circular economy shows that the main results for Bulgarian companies include several main strategic approaches: waste-free production processes; degree of decarbonization; construction of waste management systems; introduction of harmonized rules for building an information system for waste; measures against plastic pollution; amount of financial resources for the introduction of sustainable production processes and waste management.

Applying ecocentric transformation strategies implies achieving ecological sustainability by working within the constraints of natural ecosystems (Wittneben et al., 2012). Business strives to achieve ecological efficiency by continuously using only safe biomaterials in the ecological system while preserving and preserving everything that nature does not recognize and cannot degrade, as well as technological materials that circulate only in the industrial system.

Instead of separating the economic and business systems from society and nature, the aim is to see them as a whole and thus integrate, create and mimic natural closed loops that would allow

material resources to circulate in ecosystems. In addition, a successful transformation strategy requires the organization to adopt a vision of environmental sustainability. Managers need long-term thinking, where achieving a homeostatic balance on the planet is the most important consideration, and there is no separation between the social and biophysical worlds. They must believe that nature and people together form ecosystems and that their business organizations have a role in maintaining and improving these ecosystems.

4. THE FUTURE OF THE CIRCULAR ECONOMY

The results of a recent study by Gartner indicate four key technologies that support the development of the circular economy in the work of organizations. Advanced analytics indicate 34% of the companies asked, for 3D printing - 31%, 31% think it will be the Internet of Things, and 26% „vote“ for machine learning. Currently, few organizations are applying the capabilities of artificial intelligence (19%) and blockchain (8%) for sustainability purposes. However, according to the analyst company, in the next 5 years, this will change to a large extent, with over a third of organizations planning to implement such solutions.

Here's how these green manufacturing technologies can be applied:

- Blockchain - provides trust and transparency in tracking the origin of products and the resources used for them. The technology underpins the creation of transparent digital supply chains and allows natural resources to be tokenized, giving them a unique digital identity for a new way of valuing and trading them.
- Internet of things - data collected by smart devices and sensors are used to ensure higher production efficiency; to detect and prevent problems before they happen; as well as for remote support. The technology is also used to reduce waste, making it possible to monitor, for example, how much water is used in a given production and to identify where its consumption can be reduced.
- 3D printing - is changing traditional manufacturing, allowing products to be created locally, on-demand and according to personalized preferences. In this way, much of the cost of excess materials, natural resources and transportation is reduced.
- Artificial intelligence - supports the effective management of resources and the life cycle of products. Big data analytics allow us to optimize processes and make informed decisions about future items, productions, business models, etc.
- Clean technologies – are applied to various solutions aimed at protecting the environment. They often offer innovative ways to transform the residues of a given production into resources (such as water or energy) that can then be reintroduced into the product creation process.

5. CONCLUSION

The application of the circular economy in business strategies and national policy will primarily reduce the dependence on the production of primary resources and their import. The main economic effects are expected to be growth in innovation, increase in competitiveness, expansion of the IT technology sector and subsequent creation of new jobs. The end result can be expected to reduce costs and generate higher profits for companies, economic growth and a corresponding increase in welfare. For the successful implementation of a given alternative business model, a prerequisite is the preliminary analysis of the situation and preparation of the risk assessment. This analysis will help form an accurate assessment of whether the chosen strategy will prove to be the most effective.

The degree of progress regarding green policies in the Republic of Bulgaria differs from that of other European countries. From the brief analysis, it can be observed that most good examples of green models operating on the Bulgarian market are of global importance, with purely Bulgarian participation occupying a relatively small share. The way to go, as an initial step, is to learn good examples from Europe and the world, the risk analysis and the creation of effective communication channels between the state, business and society.

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Circular Economy in the Tourism Sector: An Overview of Tourism Enterprises and Tourist Behavior

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Abstract: *The tourist industry, after a slow recovery following the pandemic events, is regaining positions in the ranking of the most profitable sectors worldwide. Indeed, considering its high environmental and social impact, the tourism sector cannot escape the challenge of sustainability, by embracing the circular economy approach.*

Currently, this challenge, although debated in the academic literature, is not yet sufficiently studied at the managerial level, so tourism enterprises do not have adequate tools to evaluate their circularity. This paper aims to provide an overview of existing circular economy frameworks in the tourism sector, both at academic literature and managerial level.

The research is approached according to qualitative methodology, consisting of the literature review on the circular economy in the tourism sector, and the identification of best practices at international and Italian level. This study has a theoretical impact, providing a literature overview on the debated topic and the potential gaps to be filled, and a managerial impact, providing a set of guidelines deriving from the analysis of existing best practices.

1. INTRODUCTION

The level of growing competition in the market and the greater interest in sustainability issues cannot fail to also affect the tourism sector, one of the driving sectors for the European and, in general, global economy (European Parliament, 2017). Just consider that in the European panorama alone the tourism sector guarantees 10.4% of the PIL and employs around 25 million workers within it. The interest in the search for more sustainable tourism comes from many sides: the community in which tourism develops, the tourists, from national and international organizations that push towards greater generalized sustainability and tourism operators who intend to invest in long-term development end of their activity (Bux & Amicarelli, 2023; Fennell & Bowyer., 2019). The phenomenon of sustainable tourism, also called ecotourism, is therefore developing, which has the objective of reducing negative emissions on the environment by adopting tools such as the circular economy and implementing best practices recognized by literature and stakeholders (Axhami et al., 2023). The evolution of the tourism sector and its transformation into a sector with low environmental impact require, in addition to the willingness of stakeholders to develop ethical and sustainable tourism, that the literature provides implementation methodologies for the best practices to be adopted, methods of evaluating the best practices implemented and specific communication channels and methods concerning these aspects (Guerra & Gonçalves, 2024).

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2. LITERATURE REVIEW

In order to understand the level of in-depth analysis of the topic of sustainability applied to the tourism sector, an analysis of the literature was carried out. This search was carried out using the Scopus database, which allows you to identify texts/articles/essays through the use of keywords. The keywords used refer to the world of sustainability linked to the tourism sector to identify the best practices that tourism operators should implement in the principles of the circular economy. The keywords used, therefore, were sustainability, tourism, circular economy and best practices. The results are different in relation to the different combinations of keywords, but the reduced interest in the topic is easily seen due to the few articles that focus on the topic. Although with some combinations of keywords, it is possible to access a large pool of articles, already from the abstract it is possible to understand how the centrality of sustainability is recognized, but the impact of the tourism enterprise on the global sustainability objectives (Tomassini & Cavagnaro, 2022).

Thanks to the combination of the keywords used, 196 articles were identified, some of which were common to multiple combinations. Among these, an initial selection was made by reading the abstract, which allowed the identification of texts/articles/essays in line to draft this article. From this initial selection, approximately 60% of texts/articles/essays were not found suitable for drafting this article. The characteristic of these 100 texts/articles/essays was to mention the tourism sector within them but to focus on different elements. The remaining 40% of texts/articles/essays appear to be in line with the objective of drafting this article and have therefore been read in their entirety. After reading the 69 texts/articles/essays with abstracts in line with the purpose of the article, it was considered that only 23, and therefore approximately 14% of the 169 initially identified as texts, articles, and essays were really useful for the drafting of the same.

Table 1. Relevance of the literature review

Keywords	Circular economy, touristic	Circular economy, tourism, sustainability	Circular economy, tourism, best practice	Circular economy, touristic, best practice	Circular economy, touristic, sustainability	Total number of articles read
Articles resulting from the search	13	135	16	2	3	169
Articles with an abstract in line with the aims of the article	8	44	14	0	3	69
% of articles with an abstract in line with the aims of the article	61,54%	32,59%	87,50%	0,00%	100,00%	40,83%
Articles useful for the purpose of the article	5	11	5	0	2	23
% Of articles useful for the purpose of the article	38,46%	8,15%	31,25%	0,00%	66,67%	13,61%
Articles falling within the category but not in line with the purpose of the article	5	91	2	2	0	100
% Of articles falling within the category but not in line with the article's purpose	38,46%	67,41%	12,50%	100,00%	0,00%	59,17%

Source: Own research

Among the 23 publications (as texts, articles, and essays) resulting from the search in the Scopus database, a different approach to the subject of sustainability in the tourism sector is identified.

In particular, there is greater attention and greater depth in the reporting of virtuous projects in the field of sustainable tourism, programs studied and implemented by countries, cities, islands, or specific geographical areas (Ferronato et al., 2023; Magaudda et al., 2023; Hadzi-Nikolova et al., 2022; Falcone, 2019; Zafeirakou et al., 2022) to highlight through concrete examples that it is possible to aspire to sustainability in the tourism sector. The objective of informing the community of these examples and models of behavior is certainly virtuous, but the inability to identify common guidelines can be an obstacle to the sustainable development of the tourism sector.

Some interesting aspects that can be deduced from the literature are certainly the interest of both tour operators and actual tourists in undertaking paths to achieve sustainable development and the approach to the circular economy in the tourism sector (Velooso et al., 2021). Tourists, in fact, thanks to the greater awareness that derives from the increasingly central role of sustainability, are driven to search for real tourist experiences, which allow them to know and delve deeper into the communities with which they interface, discovering their uses and customs, culture and traditions. Greater awareness pushes tourists to improve their behavior in order to reduce the impact that their presence may have on the place visited. Their goal is to visit and explore the place where they are located, without changing the lifestyle of the native community, but rather by studying it and creating a connection with it, preserving the characteristics of the place intact for future generations and future tourists (Velooso et al., 2021). At the same time, tourism operators cannot avoid satisfying the needs of their stakeholders in order to survive in an increasingly competitive market (Salvioni et al., 2022) and are therefore driven to understand their needs and identify ways to satisfy them. The preservation of the place itself is recognized as a common interest between tourists and the communities of tourist places, to improve the economic and social living conditions of the community thanks to the contribution of tourism, without however forgetting the aspect of preservation environmental.

Finally, from the literature, we understand that the desire to improve sustainability performance in the tourism sector cannot be continued by individual operators, but must find a broader scope thanks to the intervention of state or regional organizations to identify a common project of sustainability (Ushakova, 2023; Magaudda et al., 2023). Collaboration allows you to develop a sense of common trust that pushes you to undertake the initial investments to implement circular economy techniques within the tourism sector.

3. IMPLICATIONS OF THE CIRCULAR ECONOMY IN THE TOURISM SECTOR

The objectives of the circular economy and those of the tourism sector can be aligned with the desire to preserve the available resources for as long as possible by limiting the impact that human activity has on that place (Drechsel et al., 2018). The identification of a close link between the circular economy and the tourism sector must also be highlighted in relation to the impact that tourism has on the production of waste and the use of a city's environmental resources (Nocca et al., 2023; Vardopoulos et al., 2023).

The objective of the circular economy is to implement techniques for using and reusing products to extend the life cycle of products, reducing waste and waste to a minimum (Gennari & Cassano, 2020). The objective of the tourism sector, in the same way, must be oriented towards respecting the resources of the locality in which it is located, improving the economic and social conditions of the community in which it is located and limiting its environmental impact, if not developing strategies that improve the environmental conditions of the locality (Manniche et al., 2017; Styles et al., 2013).

Concretely, thanks to the collaboration of experts on the subject and supranational programs such as the COSME Program of the European Union, examples of virtuous behavior that can be more or less easily implemented by different operators are evaluated and reported in documents that are easier to access tourist. Among the concrete examples above, we can mention the initiatives of large hotel chains such as the Intercontinental, the NH Hotel Group, or the Ibis Hotel, but also the investments of individual tourist operators such as the Ladybird Farm leisure center, the Svart Hotel or Camping Blue Ocean.

The objectives pursued can be divided into three main fields: eliminating waste and pollution by reducing the waste typical of the sector, keeping the materials being used within the life cycle for as long as possible and regenerating natural systems in which the tourist operator develops.

1. Eliminate waste and pollution by reducing the waste typical of the sector: over time the hotels of the Manotel chain have provided for the recycling of the bars of soap made available to their customers, but which they did not finish during their stay. The soap recovery step produces two advantages. The first concerns a social aspect as the process of recovering the soap bars is carried out by people with intellectual disabilities while their distribution is guaranteed by the riders, thus guaranteeing them a satisfactory and useful job for the community. The second advantage concerns the methods of reusing these bars of soap, which are first analyzed to ensure their quality and then redistributed to humanitarian associations for their reuse.

2. Keep the materials you are using within their life cycle for as long as possible: two paths can be followed to guarantee a long life cycle for the objects that make up hotels. The first example is that of the Accor Hotel chain which promotes the use of secondhand for the furnishing of its hotels, preferring to purchase furniture from markets or repair furniture through artisans rather than buying new designer objects. The second example is that of the hotels of the Ibis chain, where furniture discarded by hotels is given a second life thanks to the donation of the same to those who request it.

3. Regenerate the natural systems in which the tourist operator develops: the objective can be achieved by building or renovating hotels according to high standards of environmental performance, reducing carbon emissions thanks to the greater use of renewable energy resources and placing hotels in places easily reachable by public transport to encourage tourists to reduce their environmental impact when moving from one place to another thanks to the use of the public transport service.

Providing relevance to sustainability and ethical initiatives toward tourist locations allows us to incentivize other operators to approach the world of sustainability and implement strategies that allow the concepts of the circular economy to be satisfied (Giurea et al., 2022). The various characteristics that diversify the tourism sector internally must certainly be taken into consideration, from geographical and dimensional differences to those in the type of tourists in which one is interested. In this sense, there are no elements in the literature that allow us to unequivocally identify possible paths to take in order to achieve a higher level of sustainability. The impact of studies in this area and of information on the most virtuous cases is therefore relegated to a marginal role compared to what it could be if, at the same time, precise indications were provided for all tourism operators (Li et al., 2023; Wang & Nguyen, 2022). However, it is worth remembering that several articles offer sustainable solutions in relation to the tourism sector, highlighting problems that concern the majority of tourism businesses, such as food waste, and

proposing useful solutions to marginalize this impact (Fennell & Bowyer, 2019; Lagioia et al., 2024). A second element to which attention is paid is water waste and therefore some studies are interested in researching ways in which to exploit rainwater and develop a water recirculation system that allows waste to be limited (Ghafourian et al., 2022).

The objective of this article, which is to provide a broader scope on the topic of sustainability in the tourism sector and to identify possible initiatives that can be followed, proposes that tourism operators delve deeper into the topic and begin to approach the circular economy through elements of common problems. Think, for example, of the food waste resulting from buffet consumption practices or the search for foods outside of the seasonal period. It could be a good practice to reduce buffet consumption to favor consumption by ordering and to favor products of local origin and that reflect seasonality. This behavior could also develop positive impacts on the community in which the tourist operator is located. Another method of approaching the circular economy could be to reduce energy consumption by implementing sustainable energy sources but also by educating tourists to consume more considerable energy sources. A third solution could be to emphasize maintaining the biodiversity of local flora and fauna, implementing solutions that may be attractive to tourists. Examples of this are the development of areas dedicated to the cultivation of flowers or areas for growing fruit and vegetables, but also areas in which to house farmyard animals or for the repopulation of insects such as bees. These elements are useful from the point of view of environmental impact and at the same time increase the attractions of the tourist location, offering tourists new possibilities to get closer to nature or understand processes that they would not have the opportunity to experience in the areas from which they come.

4. CONCLUSION

The topic of the circular economy in the tourism sector is certainly a factor to take into consideration for the development of the sector in the coming years. The growing importance that sustainability assumes in the daily life of every individual will only highlight the possible waste of resources and the negative impacts on the community by tourism operators, who will not be able to avoid studying and implementing strategies that strengthen their image regarding these aspects. The implementation of the strategy to be adopted cannot be transversal to every tourist operator but must consider the peculiarities of the place and the characteristics of the host community. However, the literature must deal with the identification of guidelines that can be followed by all types of tourist operators in order to guarantee greater valorization of the theme. Furthermore, the literature will have to provide the appropriate tools so that each tourist operator, having identified the particularities that characterize it, can implement optimal strategies to reduce its environmental impact. The discussion on the topic must therefore increase and cannot fail to respond to requests for greater sustainability from this sector.

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Certification and Assessment of Sustainable Construction in a Circular Economy

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Abstract: Construction activities are among the main contributors to the greenhouse effect, high consumption of natural resources, production of huge amounts of waste and energy consumption during the life cycle of buildings, suggesting that the study of these activities is of utmost importance. Ensuring a balance between economic development, human well-being and environmental needs is a major challenge of our time in the context of the circular economy. The author of this paper aims to analyze the existing knowledge and methodologies for the certification of sustainable buildings and to consider the possibilities for an integrated assessment of their sustainability throughout their life cycle.

1. INTRODUCTION

The world faces the challenge of ensuring a balance between economic prosperity, improving people's well-being and environmental needs. Over the next 40 years, global consumption of materials such as biomass, fossil fuels, metals and minerals is expected to double (OECD, 2018), with the amount of waste generated each year increasing by 70% by 2050 (World Bank, 2018). Construction plays a particularly important role in reducing energy use, as well as reducing climate change and adapting to its effects.

Construction activities are among the main causes of the greenhouse effect, high consumption of natural resources, production of a huge amount of waste and energy consumption during the life cycle of buildings. Construction has a significant impact on many sectors of the economy, local employment and quality of life. It uses huge amounts of resources (around 50% of all extracted materials), generates over 35% of the total amount of waste in the EU and around 12% of total national greenhouse gas emissions, which can be reduced by around 80% if materials are used more efficiently (Hertwich, 2020).

The object of research in this paper is the construction sector in the context of a circular economy, and the subject is the possibilities for integrated life cycle assessment (LCSA) of the sustainability of buildings.

The authors in this article aim to analyze the existing knowledge and methodologies for integrated life cycle assessment (LCSA) of buildings, including environmental (LCA), economic (LCC) and social (S-LCA) and to offer opportunities for their application in the construction business in Bulgaria.

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The objective thus formulated implies the execution of the following research tasks:

1. to present the concept of the circular economy;
2. to consider the essence and principles of sustainable construction;
3. to consider some existing certification systems for sustainable buildings;
4. to consider the possibilities of integrating LCA, LCC and S-LCA assessments into the whole life cycle assessment of buildings;
5. to offer opportunities for the application of the LCSA methodology for assessing the sustainability of the entire life cycle of buildings in Bulgaria.

2. CONCEPT OF THE CIRCULAR ECONOMY

According to the [Brundtland Report \(1987\)](#), sustainable development aims to meet the needs and aspirations of the present generation without compromising the ability to meet those of future generations and is based on a three-pillar concept of economic, social and environmental sustainability ([Purvis et al., 2019](#)). The economic, social and environmental dimensions of sustainable development reflect the assumption that the development of the economy depends on people, which in turn depends on the possibilities of nature. In order to meet the global challenges of sustainable development in recent decades, thinking is directed toward the concept and model for the development of the circular economy ([Geldermans et al., 2019](#)) which imply an extension of the life cycle of products and when they reach the end of their life, the materials of which they are composed can be used again, so as to minimise waste disposal. The circular economy requires not only closed loops and the use of renewable energy but also the improvement of the interrelationships between participants in the process of design, production and use of products, in which the actions of one participant have an impact on other participants. To account for this influence, short-term and long-term consequences must be considered in the selection. Some of the basic elements of the circular economy are presented in Figure 1.

Some benefits of the circular economy can be ([European Parliament, 2023](#)):

- Protecting the environment, including biodiversity, reducing greenhouse gas emissions – by designing more efficient and sustainable products, reusing and recycling products, which in turn reduces the need to extract natural resources;
- Reducing dependence on raw materials – with the growth of the population, the demand for raw materials increases, and the possibility of recycling them reduces the risks associated with their procurement;
- Resource efficiency – it is key to strengthening the competitiveness of the economy, creating the conditions for growth and creating new jobs;
- Job creation and cost savings – resource efficiency is a key point in strengthening the competitiveness of the economy, designing products and materials in a way that involves reuse and recycling, will stimulate innovation, and consumers will receive more sustainable and economical products and materials, which will save them costs and improve their quality of life.

The Circular Economy Action Plan ([European Commission, 2023](#)) proposes measures on the entire life cycle of products and aims to improve the economy and increase competitiveness while protecting the environment and empowering consumers. The new Action Plan draws attention to sectors that use a lot of resources, including construction, and focuses on design and production where the raw materials used remain as long as possible in the economy.

One of the EU's conclusions is to swiftly conclude discussions on the changes to the Renewable Energy Directive, the Energy Efficiency Directive and the Energy Performance of Buildings Directive.

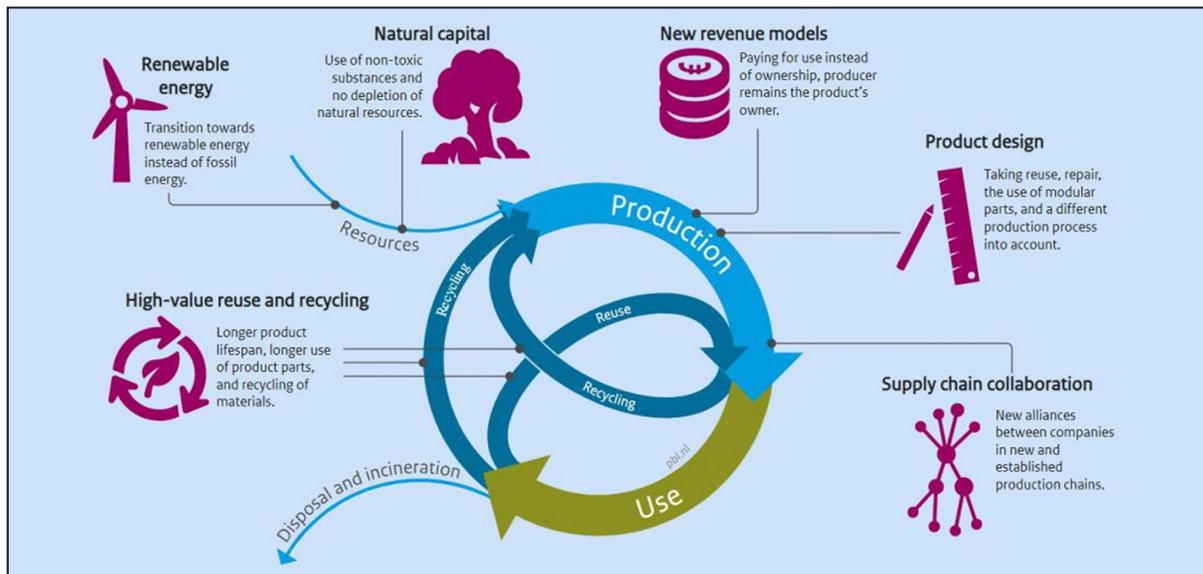


Figure 1. Some of the elements of the circular economy

Source: ASUS, n.d.

The European Green Deal (European Commission, 2019) announced an initiative to fully modernise the construction sector in line with the principles of the circular economy, namely improving the life-cycle efficiency of building assets and recovering construction waste from demolition. One of the initiatives is the introduction of a comprehensive strategy for a sustainable built environment that will promote the application of circular economy principles throughout the life cycle of buildings. This can be achieved by:

- introduction of requirements for the sustainability of construction products, including requirements for the content of recycled materials in certain construction products, taking into account their functionality and safety (Regulation (EU) No 305/2011);
- promoting measures to improve the adaptability and durability of building assets in line with circular economy principles related to building design and the development of digital building logs (European Council, 2022);
- promoting measures to reduce soil sealing, remediation of contaminated or derelict sites, etc.

3. THE ESSENCE OF SUSTAINABLE CONSTRUCTION

One of the areas where the needs of society and economic interests meet with environmental protection is construction. To a certain extent, construction technologies lead to disproportions in nature. The air, water and soil are polluted, the rates of depletion of non-reproducible resources are increasing, climate changes occur, and the so-called global warming is a consequence of environmental pollution. With the current unfavorable trends in the state of the environment, the environmentally friendly development of construction and the economy as a whole is necessary, and the search for an optimal balance between goals and interests.

The term „sustainable construction“ was defined at the international conferences held in 1994 and 1997 („Sustainable Construction“, Tampa, USA and „Building and the Environment“, Paris) as „an approach in which the creation and maintenance of buildings is based on the efficient use of natural resources and the preservation of the principles of environmental development.“ To be sustainable construction is necessary to increase the requirements for all its stages and to develop preventive activities related to the construction process from the beginning of the

development of the project to the end – the demolition of the building. This means that it is necessary to carry out an environmental assessment at all stages – design, construction and operation. It is also necessary to analyze the alternatives to the proposed solutions, which can be in several directions:

- extending the life cycle of buildings;
- energy saving;
- improving the quality of materials;
- Improving the quality of work.

Sustainable construction is a system of practices and technologies that optimize the consumption of materials and raw materials in order to reduce the negative impact of humans on the environment. While short-term economic goals are important for standard construction, long-term economy, quality and efficiency are a sustainable priority. It aims to reduce the environmental impact of buildings while optimizing their value and providing better comfort and a healthy living environment, i.e. with a city designed as sustainable, minimising the use of water, raw materials and energy throughout the life cycle.

In sustainable construction, the aim is to use local and easily accessible materials, with a short production cycle and easy to recycle, to optimize the use of water, energy and energy sources. In other words, sustainable is the construction that is ecological, energy-efficient and durable and there is a balance between three factors: economic, social and ecological.

The economic feasibility is expressed in the possibility of optimizing costs during the entire life cycle of the building, for recycling and reuse of materials.

In social aspect, it is necessary to provide high comfort, internal hygiene, cozy and healthier conditions, free access and efficiency of space.

In environmental terms, the natural environment mustn't be negatively affected by the construction of buildings and facilities.

Construction is sustainable if it is subject to the following principles, which are respected during construction and the operation of buildings:

- minimum energy intensity;
- minimum water intensity;
- minimal impact on nature;
- high living comfort;
- aesthetic appearance;
- high quality;
- safety and security;
- durability;
- maximum possibility of reuse of the input materials;
- there is an opportunity for improvement.

Minimum energy and water capacity during construction mean the use of natural materials or those that undergo fewer technological procedures, and the minimum energy and water intensity during operation means energy efficiency and the use of passive architecture techniques, i.e. ensuring that buildings can be heated, cooled and ventilated naturally or using renewable energy sources.

The environmental impact concerns the impact of each building on local ecosystems, such as changing air currents, shading, etc.

High living comfort is determined by taking into account the comfort parameters – temperature, speed, humidity and air purity, as well as the temperature of the surrounding surfaces.

The aesthetic appearance is related to the appropriate entry of the building or facility of the place where it is built and does not disturb or threaten the architectural ensemble and the natural environment.

In terms of quality, safety and security of buildings, the use of quality raw materials and accurate implementation of technology is required.

Durability is a characteristic feature of the objects of construction, it is good for each of them to have a long life, to be repairable and recycled.

In traditional construction, a large part of the materials after repair or demolition turn into unusable construction waste that pollutes the environment. The possibility of their reuse leads to an economy and a cleaner nature.

Each project must have the opportunity for improvement, i.e. green roofs, winter gardens, infrastructure for renewable energy sources, etc. can be built.

Some of the reasons why investments made in sustainable buildings, although larger (10-15% according to practice data) are repeatedly returned during operation are: (1) increased market value; (2) increased efficiency in water and energy consumption; (3) increased durability of the building; (4) provides an improved living environment.

To promote sustainable construction in Bulgaria, measures are needed in the following areas: (1) awareness of the importance of its introduction; (2) adoption of good practices by other countries; (3) development of programmes for its implementation; (4) development of a certification system for sustainable buildings; (5) preparing experts for the assessment and certification of sustainable buildings.

An important requirement for the implementation of sustainable construction in Bulgaria is the adoption of measures and incentives, some of which are: (1) municipalities to reconstruct and build municipal sustainable buildings; (2) to exploit the possibilities of European funding; (3) to apply lower taxes to sustainable buildings and lower garbage charges.

Bulgarian companies are part of the European market and can increase their competitiveness and find adequate solutions to the challenges of modern development by introducing a sustainable construction approach.

4. SOME CERTIFICATION SYSTEMS FOR SUSTAINABLE BUILDINGS

With the current adverse trends in the state of the environment, it is imperative in construction to seek a balance between goals and interests. „True sustainability“ is difficult to achieve through the application of existing building standards, so it is necessary to determine the highest

possible measure of sustainability of the construction environment that can be achieved based on the best practices currently in place.

In theory and practice, there are established systems of criteria for assessing the sustainability of buildings. They are developed as systems of loans (ratings) that take into account the impact of various indicators characteristic of sustainability. According to their type, buildings can apply for certification in any of the following categories: eco-homes, residential buildings, offices, commercial buildings, health institutions, schools, industrial buildings, and court buildings. The World Green Building Council recognizes some systems for assessing the sustainability of buildings, but in our opinion, it is necessary to unify the evaluation mechanisms and tools and create a unified assessment system that applies to all types of buildings.

Table 1. Indicators for the assessment of sustainable buildings

System	Indicator	Valuation in loans
BREEAM	<ol style="list-style-type: none"> 1. Management 2. Energy 3. Transportation 4. Water 5. Materials 6. Waste 7. Land use 8. Pollution 9. Well-being and health 	<p>Each of these indicators corresponds to a certain number of loans that form an overall score in percentage (100%):</p> <p>Pass (average) – over 30%;</p> <p>Good (good) – over 45%;</p> <p>Very good – over 55%;</p> <p>Excellent (excellent) – over 70%</p> <p>Outstanding (exclusive) – over 85%.</p>
LEED	<ol style="list-style-type: none"> 1. Environmental friendliness of location; 2. Water efficiency; 3. Energy and atmosphere; 4. Materials and resources; 5. Qualities of the environment; 6. Location and infrastructure connections; 7. Educational impact; 8. Innovativeness of design; 9. Regional importance. 	<p>The first seven indicators form a total of 100 points, and the last two bring an additional 4 and 6 points above these 100, respectively, forming a maximum score of 110. The certificates are the four levels:</p> <p>LEED Certified – from 40 to 49 points.</p> <p>LEED Silver (silver certificate) – from 50 to 59 points.</p> <p>LEED Gold (gold certificate) – from 60 to 79 points.</p> <p>LEED Platinum (platinum certificate) – over 80 points.</p>
DGNB	<ol style="list-style-type: none"> 1. Environmental friendliness; 2. Economy; 3. Sociocultural qualities and functionality; 4. Technical qualities; 5. Process management; 6. Location. 	<p>The indicators cover 49 criteria, with the location score presented separately from the others in the final certificate, so that buildings are assessed regardless of their location. Each of the criteria is evaluated on a scale from 1 to 10 and multiplied by the so-called severity factor, depending on its importance for the given object. The final score is measured on two scales. In one case, the total points collected are related to the maximum possible percentages and three types of certificates are awarded accordingly:</p> <p>bronzes – between 50 and 65 per cent;</p> <p>silver – between 65 and 89%,</p> <p>gold – over 89%.</p>
GREEN STAR	<ol style="list-style-type: none"> 1. Building management; 2. Internal quality; 3. Energy; 4. Transport; 5. Waters; 6. Materials; 7. Land use; 8. Harmful emissions; 9. Innovation. 	<p>Once all indicators have been evaluated, the influence of environmental factors, which differ from one territory to another, is also taken into account. Each of these indicators corresponds to a certain number of loans that form an overall score (100 points):</p> <p>4 Star Green Star Certified – best practice in environmentally sustainable design – (45-59 points)</p> <p>5 Star Green Star Certified – scientific excellence in environmentally sustainable design – (60-74 points)</p> <p>6 Star Green Star Certified – world leadership in environmentally sustainable design – (75-100 points)</p>

Source: Own research

This system: (1) must be transparent and flexible; (2) be supported by research; (3) take into account all factors; (4) stimulate the design and construction of sustainable buildings; (5) maintain a standard with quality assurance.

The most widely used environmental assessment systems are the British BREEAM (Building Research Establishment Environmental Assessment Method), the American LEED (Leadership in Energy and Environmental Design), the German DGNB (Deutschen Gesellschaft für Nachhaltiges Bauen), the Australian Green Star, etc. The German DGNB serves as a basis for the certification applied by the Bulgarian Green Building Council. Significant certification systems for Bulgaria are also the world leaders BREEAM and LEED (see Table 1).

According to their type, buildings can apply for certification in any of the following categories: eco-homes, residential buildings, offices, commercial buildings, health institutions, schools, industrial buildings, and court buildings. The evaluation systems used include aspects related to the use of energy, materials and water, as well as the comfort of the indoor environment (health and well-being), pollution, transport, waste and harmful emissions management, ecology and process management in general, etc.

The need to define the exact criteria and tools for measuring the sustainability of buildings is important from the point of view of property market participants. Buildings that meet certain standards for sustainable construction have many advantages, including many times lower operating costs, while maintaining and gradually increasing their price.

5. BUILDING LIFE CYCLE ASSESSMENT

The need to define the exact criteria and tools for measuring the sustainability of buildings is important from the point of view of property market participants. In terms of what and when to assess sustainability changes over the life cycle of the building – building materials and products are of paramount importance to manufacturers and contractors in terms of costs incurred, return on investment, sales or rental and durability. From the point of view of consumers (owners who have purchased buildings), building materials and products are of considerable interest in terms of their quality, their impact on health, the possibilities of easy maintenance and the provision of comfort.

Buildings that meet certain standards for sustainable construction have many advantages, including many times lower operating costs, while maintaining and gradually increasing their price.

In order to prove the usefulness of constructing new sustainable buildings and retrofitting existing ones, it is also necessary to assess their impact on the environment. With the help of project *ENSLIC_Building: Energy saving by applying life cycle assessment of buildings* (ENSLIC-SEC-WP3-100331, 2010), a methodology has been developed to assess environmental aspects and potential environmental impacts throughout the life cycle of buildings. *Life Cycle Assessment (LCA)* provides the basis for decision-making in optimizing environmentally friendly design solutions that take into account the lifetime impacts of buildings.

LCA is standardized by the International Organization for Standardization (ISO) (14040 I 14044). The questions that this methodology addresses are related to which supporting structure

is most environmentally friendly for the building, which is the best combination of building materials for the facade and what thickness of insulation would be optimal, what energy sources to choose, etc. LCA examines the environmental aspects and potential impacts on the environment throughout the life of the product – from the sourcing of raw materials to its production, use and destruction. The general environmental impact categories considered are resource use, human health, and environmental consequences (ISO 14040:2006).

The LCA assessment provides quantitative information on the contribution of buildings to climate change and the depletion of natural resources. The principle of LCA calculations is that for each stage of the life cycle, the quantities of materials and energy used, as well as the process-related emissions emitted, are examined. The latter are multiplied by characteristic coefficients proportional to the strength of their impact on the environment. A specific emission is selected as a reference and the result is presented in equivalents in terms of the impact of the reference substance. The number of equivalents summed for each environmental impact can be normalised and further weighted to arrive at an integrated result. Different instruments may use different characterization factors and different emission data if production processes differ. These instruments also use different normalization and weighting methods, which can lead to divergent results. The ability to easily obtain building data is constantly improved with the use of modern CAD applications, the use of building information models, and advanced databases. LCA may also include a universal database of emissions for many building materials and energy carriers. For more complex LCA calculations, access to larger international databases such as [Ecoinvent \(n.d.\)](#) is required.

LCA assessment includes several stages: definition of the long-term objective and scope, inventory analysis, impact assessment and analysis of results. In defining the long-term objective and scope, it is necessary to define one functional unit (the unit to which the environmental impact is linked) and the boundaries of the system (the limits of what will be included in the assessment). In order to be able to talk about a life cycle assessment approach, at least two stages of this cycle must be included, e.g. the production of building materials and the operation of the building. The definition of the functional unit is especially important when comparing different products, or in this case, different buildings. In the European standardization process “Sustainability in Construction” (CEN 350) it is recommended that it is called the functional equivalent at the building level in order to distinguish it from the functional unit at the product level (building material).

For a residential building, the functional equivalent can be described as a building with a certain location that meets national norms and requirements regarding comfort, health, safety, energy consumption, etc, for an assumed lifetime. This comparison can only be made when the functional unit or functional equivalent is the same for the two objects or design solutions compared.

Inventory analysis is the stage of collecting the data needed to carry out the assessment, and the calculations themselves are made at the next stage – life cycle impact assessment.

Many ISO and EN standards deal with LCA for built environments. These are EN ISO 14040 (Environmental management – Life cycle assessment – Principles and framework), EN ISO 14044 (Environmental management – Life cycle assessment- Requirements and guidelines), ISO 21930 (Sustainability in buildings and civil works – Basic rules for environmental product declarations for construction products and services), EN 15643 (Sustainability of construction

works – Framework for the assessment of buildings and civil engineering structures), EN 15804 (Sustainability of construction works – Declarations for environmental products – Basic rules for the product category of construction products) and EN 15978 (Sustainability of construction works – Assessment of the environmental performance of buildings – Calculation method).

According to ISO 14044:2006, this Life Cycle Impact Assessment (LCIA) has some mandatory elements: selection of impact categories, category indicators, models of characterization, allocation and calculation of results.

Life Cycle Costing (LCC) is a method of assessing the overall cost-effectiveness of an asset over time, including the costs of its acquisition, operation, maintenance and disposal. LCC is often used to determine the total cost of a building over its entire service life, to achieve better value for money invested in buildings and constructed assets. It takes into account all costs, including initial costs (such as capital investment costs, purchases and installation costs), future costs (such as energy costs, operating costs, maintenance costs, capital replacement costs, and financing costs) and any lifetime resale, salvage or disposal costs considered “cradle to grave” (Onat et al., 2013) of a product or project evaluated directly by one or more stakeholders in a product system (Liu & Qian, 2018).

LCC is mainly useful for comparing economic profitability and capital investment and should ideally be analyzed both from the system and end-user perspectives (Janjua et al., 2020) through widely adopted LCC methodologies in the construction sector.

The benefit of LCC is an opportunity to investigate the payback period for the entire life cycle of various construction products and design solutions, and the costs are divided into several groups: investment and construction costs; costs of annual energy consumption, operation, maintenance and repair; renovation and replacement costs; costs for the completion of the service life, demolition and removal of construction waste.

The focus is on both maximizing life-cycle cost reductions and reducing environmental impacts, so the two methods are suitable for combination, thus providing both insights into potential life-cycle costs and environmental impacts from alternative projects.

In recent years, proposals and standardized definitions of LCC and total cost of ownership for building owners have emerged, such as the European standard DS/EN 15643 series (ISO, DS EN 15643-5 2017) for sustainability in construction and civil engineering and the international standard ISO 15686 (Service Life Planning and Lifetime Assessment). In addition, LCC is increasingly an effective method of conducting economic assessments of the built environment (Toosi et al., 2020) through building sustainability certification systems, such as BREEAM and DGNB.

According to Langdon (2007), when using LCA and LCC in parallel in a larger evaluation process, one forms an input for the other. Combined the two methods can be used to evaluate both investments in a building and to select alternative technical solutions that are achieved with the lowest cost and certain environmental target values. In addition to the Life Cycle Assessment (LCA), which assesses environmental and resource impacts and life cycle assessment (LCC), in the context of the concept of sustainability, it is also necessary to investigate the social life cycle assessment (S-LCA). Typically, social benefits for end-users, such as inclusion, health and well-being, are not yet taken into account in the design, construction and renovation

of buildings are not analysed and are not taken into account in certification (Geldermans et al., 2019). Indicators can be very diverse, including health, safety, security, human rights, responsibility, quality, diverse environment, added social value, future value, historical continuity, cultural heritage, governance, socio-economic impacts, etc. (Liu & Qian, 2018) and this leads to a lack of consensus regarding the choice of impact indicators.

In this sense, it is necessary to develop a standardized methodology through the integration of LCA, LCC and S-LCA for a single summary assessment of the sustainability of buildings throughout their life cycle.

There are some developments related to Lifecycle Sustainability Assessment (LCSA) that describe a methodology including the three aspects of sustainability. Kloepffer (2008) develops LCSA for products, and with a broader scope, including for sector and economy, are the model of Valdivia et al. (2012).

LCSA finds application in some sectors, such as transport, agriculture, energy, but is not yet applied in the construction sector.

6. CONCLUSION

Although when we talk about sustainable buildings and sustainable urban development, we mean exactly the three pillars of sustainability – environmental, economic and social, there remains the need for a comprehensive assessment of sustainability throughout the life cycle. Currently, there are few specialists in the construction sector in Bulgaria with in-depth knowledge of LCA, unlike most European countries, where they have extensive experience in developing or using LCA tools for buildings. The most widespread building-related application to date is the use of LCA to compare the environmental impacts of different building materials.

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Unlocking Synergy: Are CESEE Countries Effectively Integrated into Global Value Chains?

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Abstract: *In an era of globalized economies, the integration into Global Value Chains (GVC) becomes very significant, as it not only shapes the trajectory of trade and economic development but also influences productivity growth, income convergence, and the overall competitiveness in the international markets. This paper examines the GVC dynamics in Central and South-Eastern Europe (CESEE) and the Baltic States. Findings reveal moderate GVC integration in the region, with a gradual decline in its share in gross exports. Sectoral and geographical structures vary among subgroups, emphasizing differences between CEE, Baltic, and SEE countries. Focusing on Macedonian trade, the study highlights increased integration and a shift towards higher forward linkages. Policy recommendations address shared obstacles, urging enhancement of non-price competitiveness and sector-specific strategies to boost innovation and collaboration. The proposed roadmap aims to guide CESEE policymakers in fostering GVC integration across diverse sectors.*

1. INTRODUCTION

GVCs have become a dominant paradigm in production over the last four decades, fundamentally changing the nature of globalization. GVC participation has made a positive impact on productivity growth and income, while simultaneously leading to heightened interconnectedness of countries and increased vulnerability to shocks due to rising vertical linkages (Cigna et al., 2022). Qiang et al. (2021) take an investment-focused approach, emphasizing the accelerated industrialization potential for developing countries through integration into multinational corporations (MNCs) production networks.

Expanding on the development paths within GVC for developing countries, UNCTAD (2013) identifies distinct trajectories, including engaging, upgrading, leapfrogging, and competing. The optimal outcome, as highlighted by the report, involves increasing GVC participation while simultaneously upgrading domestic value added in exports for higher GDP per capita growth. Concerning the recent GVC developments in the face of global shocks, WTO (2023) underscores potential signs of recovery but also warns about ongoing vulnerabilities that might hinder sustained growth. In addition, the World Bank (2020) concludes that GVC can foster growth, job creation, and poverty reduction, contingent on deeper reforms in developing countries and open, predictable policies in industrial countries. In that sense, technological change can be advantageous for trade and GVC, and the benefits can be shared widely and sustained through enhanced social and environmental protection.

This paper looks at the dynamics and structure of the GVC in the region of CESEE and the Baltic States². The purpose of this analysis is to offer insights into the intensity of integration in the

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² Baltic countries: Estonia, Latvia, Lithuania; CEE countries: Czech Republic, Poland, Hungary, Slovakia,

GVC and its characteristics, complementing the information offered by traditional foreign trade statistics. It uses UNCTAD's EORA global value chain database, whose main advantage is the broad coverage of more than 190 countries and 26 sectors, with freely available data as of 2018.

The research is structured as follows: after the introduction, there is a review of the recent empirical findings about GVC integration developments in the CESEE region and the basic theoretical concepts related to their measurement. In the third part, the results of the analysis of the scope and structure of GVC in the CESEE and Baltic countries are presented. The fourth section investigates the main developments of the GVC integration for the Macedonian economy. The fifth part offers policy recommendations that could potentially stimulate sectorial integration within the GVC for the CESEE countries. In the last part of the research, the concluding observations are summarized.

2. BACKGROUND

Examining the literature on CESEE countries in the GVC network, [Adarov \(2021\)](#) notes the diverse patterns of structural change and economic integration during the transition period. The extent of integration within GVC varies significantly across the region, with the core, represented by CEE countries and advanced CESEE economies, achieving significant structural transformation and integration. However, the periphery, encompassing Western Balkan and less developed EU Neighbourhood countries, lags, necessitating additional policy efforts for enhanced competitiveness and greater participation in cross-border production.

Building on this, [Pellényi \(2020\)](#) underscores the important role of GVC in CEE economies since the 1990s, contributing to productivity growth and income convergence. FDI has had a positive impact of FDI on the CEE region but there are challenges, including slowed technology generation and difficulties in catching up with Western counterparts in value-added capture. The need for a shift up the value chain is emphasized to address the challenge posed by successful income convergence, which undermines the traditional low-wage cost foundation of the CEE development model.

Turning attention to the Western Balkans, [Ilahi et al. \(2019\)](#) underscore the region's aspirations for export-led growth and convergence, yet acknowledges the subdued role of exports in driving economic development. GVC is recognized as an efficient means for smaller economies to integrate into global trade, with the report highlighting the importance of addressing openness, reliance on low-value products, and weak structural competitiveness to boost exports in the Western Balkans.

In alignment with this perspective, [Matusziak et al. \(2022\)](#) advocate for more intensive regional cooperation among Western Balkan economies to improve the economic landscape of the region. The identification of regional value chains is considered a key strategy to enhance competitiveness and innovation capacities, emphasizing the positive effects such an approach could have on the overall economic dynamics of the Western Balkans. In summary, the literature highlights the need for tailored strategies to address the specific challenges and opportunities of different regions within CESEE, taking into account their distinct positions in GVC and the broader context of economic integration initiatives.

Romania, Slovenia; SEE countries: Bulgaria, Croatia, Albania, Bosnia and Herzegovina, North Macedonia and Montenegro.

Integration of countries in GVC can be realized in two ways: by providing inputs for the export of other countries (forward linkage) or by using inputs from other countries that are incorporated into the exports of the domestic economy (backward linkage) (Ignatenko et al., 2019). The forward linkage indicator is represented by indirect domestic value added, while the backward linkage indicator is represented by the imported component of exports (ie foreign value added). Countries with a high degree of specialization are mostly involved in GVC through backward linkages, while resource-rich countries are dominated by forward linkages. One of the most commonly used indicators of countries' involvement in GVCs is the GVC participation index, which is calculated as a sum of forward and backward linkages divided by gross exports. For interpretation, a higher value of the index indicates a greater involvement in GVC.

3. GVC IN CESEE

The analysis continues with a review of the involvement in the GVC of the entire group of CESEE and Baltic countries and of the separate subgroups. The goal is to determine the degree of integration of these countries in the GVC, its development over time, as well as the differences between the subgroups. For this purpose, the GVC participation index is calculated for each of the countries in the sample in the period from 1995-2018.

Figure 1 shows that the countries of the region as a whole are moderately integrated in the GVC, while the value of the GVC participation index is about 62.8%, on average for the observed period. However, a trend of a gradual and slight decrease in the share of GVC in gross exports can be observed, indicating more limited benefits from trade in GVC. Viewed by individual subgroups of countries, the participation of the countries of SEE in the GVC significantly lags behind the CEE and the Baltic countries, reflecting their relatively smaller role within the GVC. In terms of the structure of the GVC, the participation of backward linkage prevails, that is, the countries of CESEE are on average net importers of value-added, which indicates more modest benefits from the GVC integration. However, in the countries of SEE, backward and forward linkages participate almost equally in GVC.



Figure 1. Global value chains participation index (% of gross exports)

Source: UNCTAD-Eora Global Value Chain Database, 2018; IMF, 2023; own calculations

If the GVC participation is measured in terms of GDP (Figure 2), the countries of the SEE are significantly less integrated in the GVC than the CEE and Baltic countries, which reflects the limited role of exports in these economies.

The following analysis refers to the sectoral and geographical structure of the GVC of the countries of the region. Tracking the position of countries or individual sectors within the value chains enables mapping of international production networks and analysis of the

international spillover of macroeconomic shocks. This analysis is also useful for determining the short-term dynamics of foreign trade flows. At the same time, macroeconomic shocks and trade policy measures can cause different effects on the individual components of foreign trade, depending on the degree of their integration in the GVC.

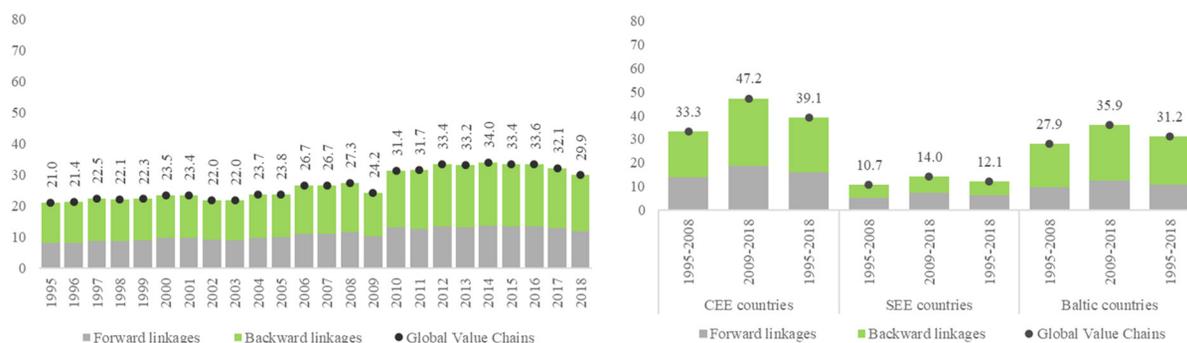


Figure 2. Global value chains participation index (% of GDP)

Source: UNCTAD-Eora Global Value Chain Database, 2018; IMF, 2023; own calculations

Data on the sectoral structure of backward linkages show that, on average, sectors with low and medium complexity of production, such as primary products, labor-intensive products and services, and regional processing, are predominant among the countries of the SEE, in line with the lower degree of economic development. The results of the Macedonian economy deviate positively from the average for the group of SEE, due to the higher representation of the foreign component in labor-intensive and primary products, in the form of raw materials and components for the needs of the domestic processing and textile industry. Regarding the CEE and Baltic countries, in addition to their relatively higher degree of integration in the GVC, they have a more favorable sectoral structure of backward linkages. Thus, among the countries of the CEE region, the segment of knowledge-based products, which represents industrial production with a higher degree of complexity and greater value, significantly prevails. These results indicate their better positioning in the mechanical, automotive and chemical industries.

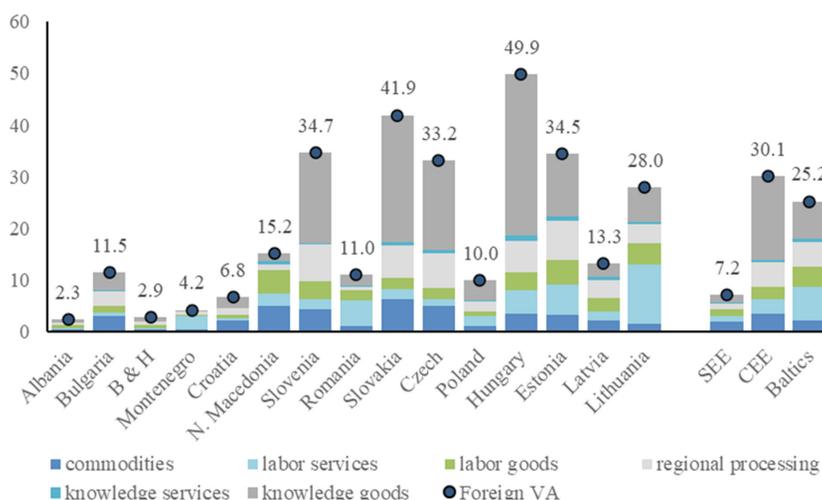


Figure 3. Sectoral decomposition of backward linkages, 2015 (% of GDP)

Source: UNCTAD-Eora Global Value Chain Database, 2018; IMF, 2023; own calculations

Countries from the region of CESEE and Baltics as a whole are less involved in GVC through forward than through backward linkages. Seen by subgroups, CEE economies are characterized

by the highest integration, which is due to relatively higher indirect value added in the segment of knowledge-based products, as well as regional processing and labor-intensive services. Within the countries of SEE, the sectoral structure shows an almost equal share of knowledge-based services, primary products and regional processing.

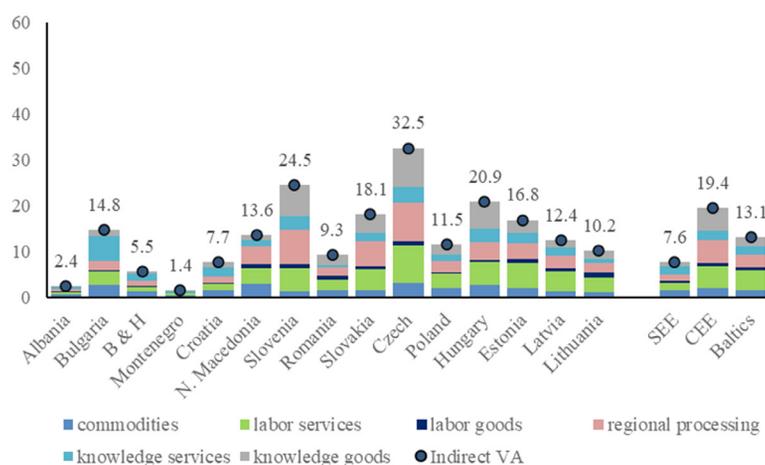


Figure 4. Sectoral decomposition of forward linkages, 2015 (% of GDP)

Source: UNCTAD-Eora Global Value Chain Database, 2018; IMF, 2023; own calculations

The geographical structure of the backward linkages in the GVC indicates a high degree of regionalization for the countries of CESEE, given that over 60% of the backward linkages in their exports originate from European countries. Compared to the CEE countries, the SEE countries are relatively less connected to Germany, which is the largest hub of GVC in Europe and a world export giant. As the geographical structure of the GVC has an impact on the benefits that countries will realize from joining the GVC, the strong connectivity of CEE countries in German value chains is seen as one of the drivers of the relatively stronger export performance of this group of countries. For the countries of SEE, part of the backward linkages originates from Italy (especially for Albania), as well as from the CEE, which is an indication that some of the companies originating from this region transfer part of their production activities with less value in the countries of SEE. Connectivity in the GVC within the region of SEE is relatively limited, except for Bosnia and Herzegovina and North Macedonia. For the Baltic countries, a relatively more significant part of the foreign-added value in GVC originates from Russia.

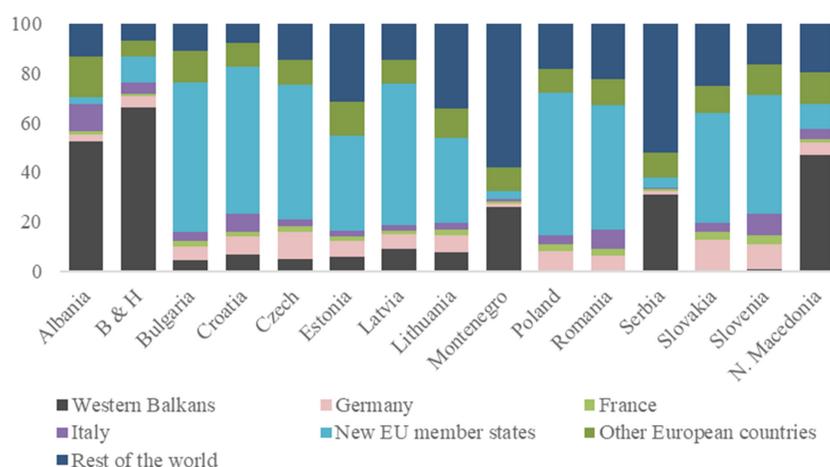


Figure 5. Geographical decomposition of backward linkages, 2015 (% of GDP)

Source: UNCTAD-Eora Global Value Chain Database, 2018; IMF, 2023; own calculations

Overall, the conducted analysis of GVC based on the EORA database shows that the countries of the CESEE region are moderately integrated into GVC. At the same time, the data indicate a pronounced regionalization of GVC and their concentration in several sectors of the economy. A more intensive GVC integration can contribute to better export performance, especially for the smaller economies in the region, enabling their integration into global trade, without the need for specialization in each separate stage of production.

4. MACEDONIAN INTEGRATION WITHIN THE GVC

The following analysis focuses specifically on the Macedonian integration within the GVC, in order to highlight several favorable developments in the more recent period. The Macedonian exports are more moderate when measured through value-added instead of through gross exports. Macedonian gross export of goods and services in 2018 amounted to 7.6 billion USD, out of which it contributed to GDP with only 4.3 billion USD (Figure 6). Dynamically, the added value in exports (income created through exports) is growing gradually, but still slower in relation to the growth of gross exports.

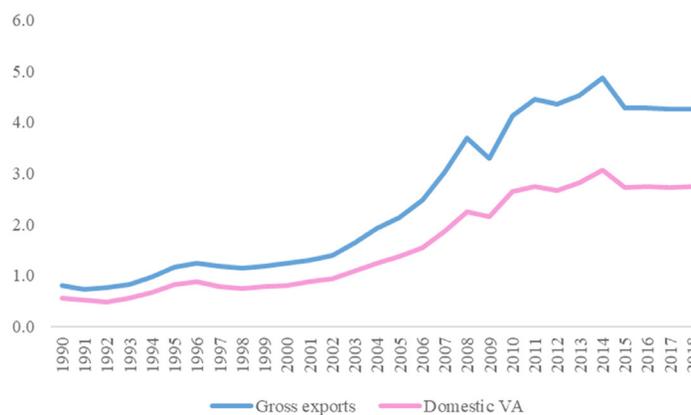


Figure 6. Gross exports and domestic value added in Macedonian exports (billion USD)

Source: UNCTAD-Eora Global Value Chain Database, 2018; NBRNM, 2023

Figure 7 represents the dynamics of the involvement of the Macedonian economy in the GVC in the period from 2000-2018. The GVC participation index of the Macedonian economy reached 72.6% in 2018, which represents a growth of 11.7 p.p. compared to 2000. This points to increased integration in GVC and greater openness of the Macedonian economy. At the same time, certain shifts in the structure of GVC are observed. Namely, in the observed period, there was an increase in the indirect domestic added value, whose share in 2018 is almost equal to the share of the foreign added value. In other words, the driver of increased integration in GVC is the intensification of the so-called forward link in trade. Since the indirect domestic value added is not intended for an economy as a final destination, it is re-exported here to third countries, it is relevant for real economic growth and job creation. At the same time, the data show that more than half of the domestic added value in Macedonian exports is indirect added value, which is similar to the average for the countries of SEE.

The further analysis investigates the involvement of the Macedonian economy in the GVC from the perspective of individual sectors. Figure 8 presents the calculated indexes of GVC by sectors, together with the constituent components, the indirect added value, and the foreign added value. Calculations made based on data from the EORA database show that metal and non-metal mineral products are the segment that is most integrated in GVC, which is due to the high

participation in exports of both forward and backward linkages. The high involvement of both the textile and the paper processing industries is mostly due to the establishment of strong backward linkages. The remaining sectors record a relatively moderate integration in GVC, while backward linkages also prevail in their exports.

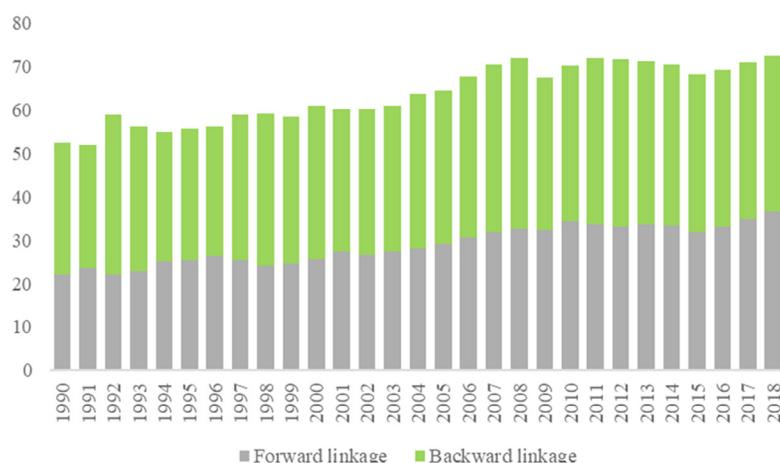


Figure 7. Global value chains participation index of the Macedonian economy (% of gross exports)

Source: UNCTAD-Eora Global Value Chain Database; own calculations

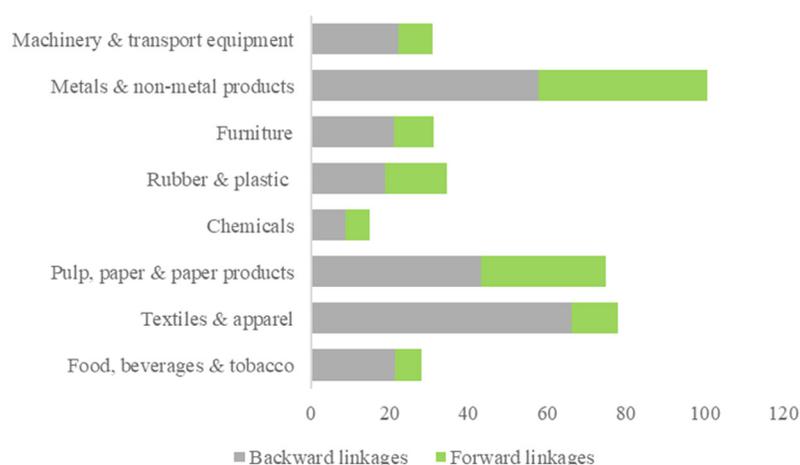


Figure 8. Sectoral decomposition of the global value chains participation index of the Macedonian economy, average for the period 2010-2017

Source: UNCTAD-Eora Global Value Chain Database; own calculations

In summary, the results show that there is an improvement in the GVC integration in the period from 2000-2018. Namely, the GVC participation index has increased, which is stimulated by the intensification of the forward linkages in foreign trade. Hence, in the last observed period, the almost equal representation of backward and forward linkages in Macedonian exports results in a relatively greater integration in GVC in comparison with the average for the SEE countries. At the same time, the data show that more than half of the domestic value added in Macedonian exports is indirect added value. The sectoral analysis of the domestic value-added points to high participation in the export of food, beverages and the tobacco processing industry, as well as in the export of chemical products, rubber and plastic products and furniture. The sectorial GVC participation indices provide insights into the industrial sectors that are most involved in GVC, as well as the role of forward and backward linkages.

5. POLICY RECOMMENDATION

Several economic sectors in CESEE countries encounter shared obstacles hindering their integration into GVC. These impediments primarily arise from financial constraints, elevated prices of input raw materials, a scarcity of skilled labor, limited access to input materials, and the complexities of trade regulations. Additionally, factors such as unfair competition practices, legal uncertainties, political instability, and bureaucracy contribute to these challenges. In the SEE countries, foreign-owned companies grappling with barriers to investment in the automotive sector encounter specific challenges. These include issues related to the regulatory framework, inadequate local supply of raw materials, restricted production capacity, lack of skilled labor, and political instability. Local companies within the automotive sector in these countries face hurdles such as limited competitiveness, insufficient resources for investments, labor-intensive operations, low technological and innovative capabilities, and a lack of collaboration along the value chain, further restricting their access to GVC. For the CEE countries, the sectoral specialization patterns can impact opportunities for advancement. In the automotive industry, a pivotal sector in CEE manufacturing, the low standardization of products amplifies entry and switching costs for suppliers, complicating efforts to upgrade. Lead companies maintain stringent control over design and R&D, further impeding progress. In the electronics industry, another critical sector, midstream firms face heightened competitive pressure due to extensive standardization, limiting available resources for innovation amidst margin constraints.

In fostering GVC integration in CESEE countries across various sectors, strategic recommendations are necessary to ensure effective implementation. One of the priorities should be to enhance the non-price competitiveness of producers. In that context, the agrifood sector should focus on supplying high-quality, ecological products, resilient to price elasticity. Capitalizing on the ongoing green transition megatrend becomes imperative, anticipating an upsurge in demand for such products. Similarly, the textile sector must also transition from the current low-value, low-cost state to a high-value state. Local firms should align their efforts to provide high-quality products that compete not only on price but also on overall quality. In the energy sector, the recommended strategy centers on renewable energy, energy efficiency and the reduction of pollution.

For the automotive value chain in SEE, a shift towards higher value-added activities is crucial, coupled with enhanced collaboration between local and foreign companies. For that purpose, this sector should focus on attracting foreign investors to technologically advanced companies at the higher value-added end of value chains, bolstering political stability and institutional quality, stimulating vocational education, fostering cooperation between foreign investors and local educational institutions, promoting collaboration between local and foreign companies, and prioritizing local sourcing of raw materials.

The IT value chain should strive to achieve greater innovation and comprehensive sector development. Moreover, it is important to provide specialized support for innovation activities through financial aid and guarantees, enabling local innovative companies to emerge as leaders. These targeted recommendations serve as a roadmap for facilitating GVC integration across diverse sectors in the specified regions.

6. CONCLUSION

In conclusion, this research provides a comprehensive examination of the GVC integration in CESEE and the Baltic countries, based on data from UNCTAD's EORA database spanning up to 2018. The study discloses a moderate level of GVC integration in the region, coupled with a gradual decrease in its share within gross exports. The nuanced analysis of sectoral and geographical structures among subgroups underscores the diversity in integration dynamics across the region. Delving into the specific case of Macedonia, the findings unveil positive trends, indicating an uptick in integration and a significant shift towards higher forward linkages.

Policy recommendations emerge as crucial components of this research, urging CESEE policymakers to address common obstacles hindering GVC integration. The proposed measures emphasize the need to enhance non-price competitiveness, foster sector-specific strategies promoting innovation, and facilitate collaboration. Given the critical role of GVC integration in influencing trade, productivity, and overall economic competitiveness, the outlined roadmap serves as a strategic guide for CESEE policymakers. It outlines steps for fostering a more robust and sustainable integration, positioning these nations for increased economic resilience and competitiveness within the global economic landscape.

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Placement of Small Producers in Large Retail Chains

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Abstract: *In the Republic of Croatia, there are almost no retail chains in which a large representation of domestic products has not become a development and marketing imperative. Small producers need to know how and in what way to market their products in order to reach the market and increase their sales. Several strategies can be used when placing products of small producers in retail chains. One of the strategies is “Field to Table”. This strategy is part of the EU’s green plan, and it aims to respond to the challenges of sustainable food systems. With the “Field to Table” strategy, the inextricable mutual connection between healthy people, healthy societies and a healthy planet is confirmed, with an emphasis on high quality and geographical origin. The strategy “Eat What’s Worth It” is implemented by the Croatian Chamber of Commerce to increase the consumption of local products and raise the culture of their consumption. Domestically produced products have become a business imperative for large retail chains, and they implement various marketing campaigns to increase their sales and find the appropriate market segment of customers. For the purposes of this paper, research was conducted on the position of small domestic producers in large retail chains and strategies and marketing campaigns that are implemented in the marketing of their products.*

1. INTRODUCTION

The retail chains are defined as a network of retail stores operating under joint ownership or franchise and with a standardized range of products or services. Retail chains can vary in size and specialization ranging from small local chains to large international trading corporations. An essential characteristic of all retail chains is their ability to offer customers a unique shopping experience in all their stores, and they achieve this by standardizing the product range, pricing policy, design of retail outlets, and the use of appropriate marketing strategies.

The retail market in the Republic of Croatia is characterized by the presence of both domestic and international retail chains, with several dominant chains that lead the market. In the last few years, the retail market has faced increased competition and consolidation, which has resulted in the further strengthening of the largest retail chains and an increase in their market share at the expense of smaller retailers. One of the significant characteristics of the Croatian retail market is the high level of penetration of supermarkets and hypermarkets, which indicates consumer preferences towards buying in larger sales formats. There is also a growing trend of online shopping, further driven by the COVID-19 pandemic, which has accelerated e-commerce development within retail chains. The Croatian retail market is also characterized by a growing focus on long-term business sustainability and increasing the share of local suppliers in the supply chain.

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Small producers represent significant stakeholders in the global economy, forming a key component in the innovation process, employment, and economic growth. The role of small producers is particularly pronounced in adapting to local markets and meeting the specific needs of customers in a particular smaller market of a local character.

2. RETAIL CHAINS

Efficiency in procurement and distribution is one of the key elements of the success of retail chains (Fournely et al., 2022). Through centralized inventory management and procurement, retail chains establish economies of scale, which is precisely the critical prerequisite that allows them to offer competitive prices in the retail market. Retail chains frequently use advanced supply chain management systems and specific technologies for data processing, inventory optimization, and demand forecasting. Retail chains use almost all aspects of modern marketing, such as various strategies of communicating with the market, customer loyalty programs, personalized promotions, and targeted marketing, all to attract and retain new and existing customers. Digital transformation has further encouraged digital channels through which retail chains communicate with consumers and has enabled them to use online platforms and social networks to communicate directly with customers.

The historical development of retail chains began in the 19th century with modern retail formats. The first retail chains that appeared in the United States started as small neighborhood stores that expanded over time and grew into a chain of stores. A critical moment in the historical development of retail chains was the introduction of the concept of self-service, and the first to implement the concept was Piggly Wiggly in the US in 1916. The self-service concept allowed customers to choose their products, thus reducing the need for sales staff and significantly accelerating the buying process. The further development of supermarkets in the middle of the 20th century contributed to the accelerated development of retail chains. Supermarkets offer a wide range of products within a single store, often at lower prices than traditional stores. This was the key to mass popularizing retail chains and building their dominant position in the retail market. The process of globalization and further technological progress in the late twentieth and early twenty-first centuries further transformed retail chains.

Large multinational corporations such as Walmart and Tesco have emerged and ushered in a new era in the development of retail chains by focusing on global expansion and supply chain integration. Digital transformation and e-commerce development have shaped a further direction of growth by allowing retail chains to upgrade their business through online platforms and providing online shopping services. In the late twentieth and early twenty-first centuries, retail chains faced growing pressure from the public and regulatory bodies regarding sustainability and ethical practices; it was precisely this that led to a focus on responsible business, including sustainable procurement practices, waste reduction, and respect for workers' rights.

In relation to classic retail formats, retail chains are characterized by numerous comparative advantages crucial for their success and development. The key and most significant advantage is the economies of scale; due to the large volume of their own business, retail chains can purchase products in large quantities and consequently at lower entry prices, allowing them to offer customers more competitive prices. The processes of centralized management and standardization of operations lead to a reduction in operating costs (Bonanno & Çakır, 2022). Broad reach also represents a comparative advantage.

Retail chains have great potential opportunities through which they can reach a wide range of customers using the network of their stores and online platforms, which allows them to build a strong brand and strengthen customer loyalty. The advantages are also in innovation and supply chain and logistics as a unifying function. Retail chains are often leaders in the implementation and operational application of advanced technological solutions for inventory management, optimization of delivery processes, and demand forecasting, which further improves efficiency and profitability (Arrigo & Pellicelli, 2022). In addition to the many comparative advantages that retail chains possess over traditional retail formats, they also face many challenges. It is documented that a large percentage of the variation in prices and promotion tactics across stores can be explained by retail chain and especially market/chain factors, whereas market factors explain only a smaller percentage of the variation. The chain-level price and promotions similarity can be explained by similarity in demand. In particular, a large percentage of the variance in price elasticities and promotion effects can be explained by retail chain and especially market/retail chain factors (Hitsch et al., 2021).

One of the biggest challenges is intense competition on the one hand from other large retail chains and, on the other hand, from small local stores that can often be more flexible and adaptable to the specific requirements of local consumers. A major challenge is maintaining relevance and continuously adapting to changing consumer habits. In a time of digital transformation and growing awareness of green policies and sustainability, retail chains are forced to constantly improve and adapt their business models to maintain market competitiveness (Vitiello et al., 2022). Supply chain management also poses a significant challenge, especially in the context of global disruptions such as pandemics or trade wars (Gatta et al., 2023). Maintaining supply chain efficiency requires sophisticated planning and quickly adapting to unforeseen external circumstances.

3. RETAIL MARKET IN THE REPUBLIC OF CROATIA

Consumers increasingly appreciate products of local origin and environmentally friendly business practices that retail chains strive to integrate into their offer and business practices as much as possible. Retail chains in the Republic of Croatia also face various other challenges, including regulatory changes, rising pressure on prices, and the need for continuous business innovation to meet the changing needs of consumers. Contrary to the significant challenges, the Croatian retail market and retail chains as its stakeholders continuously continue to grow, driven by investments in the modernization of sales facilities, the expansion of the sales network, and the constant improvement of the consumer experience.

The Croatian retail market is characterized by a relatively high degree of concentration, with several leading retail chains holding a significant part of the market (Table 1). The data presented in the table provide a clear insight into the Croatian retail market and its market dynamics and represent indicators of the performance of individual retail chains in the observed period. While some chains, such as Konzum, Lidl, Spar, and Kaufland, are showing signs of growing and strengthening their market position, others are facing challenges affecting the decline in their revenues and declining market share.

Analyzing these trends is crucial for the strategic management of retail chains because it provides a qualitative basis for strategic planning and decision-making to improve performance and achieve sustainable growth. Retail chains manage a significant market potential; cumulatively,

the largest retail chains in the Republic of Croatia own over ten thousand retail outlets and the arrival of manufacturers on the shelves of retail chains represents a substantial step forward in the development of small producers and the growth of their revenues and other benefits.

Table 1. Top 15 retail chains by sales revenues and the size of market shares in the Republic of Croatia from 2018 to 2022

	RETAIL CHAIN	Sales revenue in millions of EUROS					Market share of the retail chain (%)				
		2018	2019	2020	2021	2022	2018	2019	2020	2021	2022
1	KONZUM	1.190	989	1.310	1.383	1.573	25,25%	19,52%	25,25%	24,40%	23,84%
2	LIDL	688	783	800	866	1.032	14,59%	15,45%	15,42%	15,27%	15,64%
3	SPAR	553	891	610	658	757	11,73%	17,57%	11,74%	11,60%	11,47%
4	BERRIES	502	520	540	616	710	10,66%	10,26%	10,40%	10,86%	10,75%
5	KAUFLAND	477	514	513	555	621	10,12%	10,15%	9,89%	9,78%	9,41%
6	TOMMY	376	413	416	476	545	7,98%	8,14%	8,01%	8,39%	8,25%
7	STUDENAC	220	222	238	308	412	4,67%	4,38%	4,58%	5,43%	6,24%
8	KTC	194	204	201	213	237	4,11%	4,03%	3,87%	3,75%	3,58%
9	NTL	141	143	153	148	159	3,00%	2,82%	2,96%	2,62%	2,41%
10	SHOPS KRK	52	52	46	62	130	1,10%	1,03%	0,89%	1,10%	1,97%
11	BOSO	83	87	92	103	123	1,75%	1,71%	1,78%	1,82%	1,86%
12	LONIA	74	79	96	97	98	1,57%	1,55%	1,84%	1,71%	1,49%
13	RIBOLA	64	67	62	69	83	1,36%	1,32%	1,19%	1,22%	1,25%
14	GAVRANOVIĆ	57	58	62	62	64	1,20%	1,15%	1,20%	1,10%	0,97%
15	TRGOCENTAR	43	47	52	54	57	0,90%	0,93%	1,00%	0,96%	0,86%
	ALTOGETHER	4.713	5.069	5.190	5.670	6.600	100,00%	100,00%	100,00%	100,00%	100,00%

Source: authors, according to the data from the [Croatian Bureau of Statistics, n.d.](#)

4. METHODOLOGY AND RESEARCH OF MARKETING CAMPAIGNS FOR THE PLACEMENT OF SMALL PRODUCERS

For the purposes of the research, secondary research was conducted by analyzing retail chains' published data to gain insight into the marketing campaigns for the placement of small producers. The research was conducted in December 2023. Following the set theoretical-methodological approach and the titled issue, it is possible to set the hypothesis:

H_1 – Retail chains use marketing campaigns to promote small domestic producers.

Small manufacturers are represented through a wide range of companies, craftsmen, and independent entrepreneurs operating at a relatively simpler organizational level than large corporations. Fewer employees, lower incomes, and lower production capacity characterize them. Their competitive advantages are flexibility, close connection to the local community, and the ability to quickly adapt to customers, making them an indispensable part of the economy. The criteria for categorizing small producers vary between countries, the most common being the number of employees, the annual income generated, and the amount of funds invested (Otte et al., 2022). Small and medium-sized enterprises need clearer avenues of communication with the government and better resources for learning and training. SMEs also need to expand their implementation of information technology to improve collaboration. In the meantime, they need to improve their power positions in the supply chain and reduce dependence on supply chain partners (Yang et al., 2023). Small and marginal producers contribute significantly to agricultural production and livelihoods all over the world. The small size of operational holdings makes them highly susceptible to market risks leading to low levels of farm income (Lalitha, 2019).

Small producers in the Republic of Croatia are characteristically defined as companies with less than 50 employees and annual income that does not exceed a specific defined threshold. From a historical point of view, small producers were a driver of industrial development, especially during the early stages of the Industrial Revolution. Today, their development is characterized by rapid technological changes and globalization. Digital transformation has enabled small producers to have easier access to local and global markets, greater market visibility and more efficient production. All new technologies bring new challenges, requiring constant investment in innovation and adaptation to changing market trends.

Small producers face various challenges, including limited access to finance, high competition, regulatory constraints, and the most common lack of their supply chain. These challenges require strategic and innovative thinking to ensure sustainable business in a competitive market. Despite the challenges faced by small producers, they have unique market opportunities, and their flexibility allows them to quickly adapt to changes in the market. At the same time, closeness to customers helps them build strong and loyal relationships with customers. Very often, small manufacturers drive innovation in their niches, producing personalized and specialized products that meet the market's specific needs. Through the process of digital transformation and e-commerce, they are provided with opportunities to expand market reach and market visibility beyond their local environments (Abraham et al., 2022). Small producers are essential to the economy, providing a foundation for innovation, employment, and economic growth (Srbinovska & Santa, 2022). When asked what the largest challenges are for milk farms in the current agricultural system, the owner had one request: "Just let us be small" (Huber, 2020). Retail chains in all segments are improving their customer relationships, and investments in customer relationship management have been growing in recent years. The first step towards a successful CRM strategy is better customer knowledge, for which customer segmentation plays an important role (Oliveira et al., 2022).

In order to successfully market the products of small domestic producers, large retail chains implement various strategies for selling domestic products and marketing campaigns. The most famous is the "Farm to Fork" strategy, which is part of the European Green Deal, aiming to make Europe the first climate-neutral continent by 2050. The key benefits of the European Green Deal are clean air, clean water, healthy soil and biodiversity, renovated, energy-efficient buildings, healthy and affordable food, widespread public transport, clean energy, and cutting-edge clean technological innovation, longer-lasting recyclable products, recycled and reused, AND in terms of transition, future-proof jobs and skills training, and globally competitive and resilient industry (European Commission, 2023). The Farm-to-Fork Strategy is a new comprehensive approach in a way that Europeans value sustainability. In this way, an opportunity is created to improve lifestyle, health, and the environment. Creating a favorable food environment that facilitates the selection of a healthy and sustainable diet will benefit the health and quality of life of consumers, and reduce health-related costs for society. Consumers are paying increasing attention to environmental, health, social, and ethical issues and are looking for value in food more than ever before. Even as societies are increasingly urbanizing, they want to feel closer to their food. They want food that is fresh, less processed, and sustainably targeted (European Food Safety Authority, 2023). The goal of the "Farm to Fork" strategy is to build a food chain that will bring multiple benefits to producers, consumers, the environment, and the climate. A greater selection of healthy food from reliable sources will contribute to consumer health, increasing the quality of life and reducing production costs. In order to implement the strategy effectively, the European Commission has proposed concrete actions, e.g., reducing the use of chemical pesticides by 50%, reducing nutrient loss by 50%, reducing the use of chemical fertilizers, and reducing the sale of antimicrobials for farmed

animals and aquaculture by 50% by 2030. The strategy focuses on protecting animal and plant health and encouraging organic farming, which aims to have at least 25% of agricultural land in the European Union under organic farming by 2030 and to significantly increase organic aquaculture. It is planned to increase consumer confidence through promotional campaigns. The European Union also supports this strategy through financial instruments from the Cohesion Fund and the European Agricultural Fund for Rural Development. Member States will increase support for effective knowledge and innovation systems in agriculture and establish the work of advisory services necessary to achieve the Green Deal. The Farm-to-Fork Strategy covers five steps: production, processing, distribution, retail, and consumers. Production covers agricultural production of fresh fruits and vegetables, livestock farming, fishing, etc. Usually, countries specialize in a particular type of agricultural production depending on the local climate and production tradition. Processing involves processing fresh agricultural products into products (e.g., olives processing into oil). Distribution is the process by which processors and manufacturers connect with retail. Logistics services provide specialized food transportation options. Retail is a place where sellers expose products to consumers and provide them with easy access to food and payment methods. Consumers dictate the structure of the supply chain and the food that retailers offer to their liking. If the demand for certain foods increases, such foods will become more available in stores over time (Authena, 2012). The Farm-to-Fork is a new comprehensive approach to food sustainability in the European Union. It is also an opportunity for small producers for whom sustainability can become a trademark, and they are allowed to become market leaders (Gospodarski list, 2021).

The marketing campaign Eat What's Worth was launched by the Croatian Chamber of Economy to promote local fishery products, raise consumer awareness, and increase consumption primarily of local fishery products. The reason for this is the fact that the Republic of Croatia is a Member State of the European Union with one of the lowest annual consumption of fish per capita, which is only 8.9 kg per person and huge imports of fish. The project covers all types of fish; freshwater fish and fish from the sea. One of the tasks of this project is to use the consuming capacities that the population has through the knowledge of the health value of fish as a food and to identify the key obstacles that exist on the market today that make the national consumption of fish low. The campaign aims to create recognition of Croatian fishery products primarily among domestic consumers, but also in the foreign market. Targeted activities aim to provide Croatian producers with the same opportunities and conditions to equally participate and compete with other market participants (Croatian Chamber of Economy, 2017). The project was jointly initiated by the Ministry of Agriculture, Fisheries and Rural Development, the Croatian Chamber of Economy, and the Croatian Chamber of Trades and Crafts, and its implementation includes the Ministry of Tourism, fishing cooperatives as well as many professional and scientific institutions and associates.

The European Union ranks fourth (behind China, India and Peru) with a production of some 7 million tons of fish and the sector employs about 350,000 people. Within the European Union, the two largest fish producers are Spain and France. In the Republic of Croatia, cultivation activity occupies about 27% of the fishing sector, the total annual production of mariculture is about 12,000 tons, and freshwater aquaculture is somewhere up to 7,000 tons. The most important segment of Croatian fisheries is certainly commercial fishing at sea, where the current catch amount is about 70,000 tons, and the catch of small pelagic fish is as high as 85%. In these proportions, it is clear that Croatian fisheries products cannot compete in quantities on the world and the EU markets, but that they can compete with what is even more important for today's demanding customer, and that is quality (Agroklub, 2023).

The marketing campaign *The Best from Croatia* is carried out by the Konzum retail chain to involve domestic manufacturers in its product range. With the help of the campaign, Konzum helps small domestic producers market their products throughout the Republic of Croatia at Konzum's points of sale. Cooperation with domestic suppliers has been Konzum's strategic direction from the very beginning of its business, which emphasizes the awareness and importance of supporting Croatian production in order to achieve domestic self-sustainability (Konzum, 2023). In order to encourage the business empowerment of domestic producers, Konzum launched an initiative with the Ministry of Agriculture to secure additional places on its shelves for domestic producers whose products could, until then, be purchased only in local communities. With the help of large buyers such as PIK Vinkovci, Marinada and Fragarija, Konzum has opened a valuable channel of distribution of local products throughout the Republic of Croatia. The campaign *The Best of Croatia* established partnerships with individuals and families who work in creating local products in order to further develop. Reducing the length of the supply and transport chain from local producers also has a beneficial impact on the environment by lowering emissions and using additional packaging. Gradually, the cost of delivery also falls, and the quality of fresh produce increases because domestic goods do not pass a long-term supply chain that includes long-term transport and storage processes. In addition to encouraging sustainable development, products from Croatian producers can be seen in more than 50 Super Konzum stores in specially decorated corners of *The Best of Croatia*, special parts of Konzum stores intended only for domestic products. Konzum is the only one proud to use the *Meat of Croatian Farms* label and contributes to the preservation of the centuries-old tradition of Croatian fisheries with the label *Fish of Croatia – Eat What is Worth*, awarded by the Ministry of Agriculture and the Croatian Chamber of Economy as a quality label.

The marketing campaign *Tastes of Homeland* is carried out by the retail chain Lidl. Under the brand *Tastes of Homeland*, there are autochthonous products of Croatian family farms. Lidl has included domestic Croatian producers to supplement its offer and meet consumer requirements (Okusi zavičaja, 2023). The brand *Tastes of Homeland* contains autochthonous products from all Croatian regions. With this project, Lidl has supported domestic producers, and the *Tastes of Homeland* line, which includes cured meats, fish and dairy products, bread and pasta, fruits and vegetables, honey and oil, now count more than 70 products available to customers in all Lidl stores throughout the Republic of Croatia. Lidl's Product line *Tastes of Homeland* will also expand in the future, complementing new indigenous products.

The marketing campaign *Yes! It is domestic*. Spar supports small domestic producers in order to help market their products and reach their users. Spar Croatia, in this way, believes in the quality of local products, which are increasingly common on their shelves. Spar currently cooperates with as many as 400 small, medium, and large Croatian suppliers, and this number is constantly increasing. With the aim of even greater recognition of domestic products, SPAR Croatia has introduced the brand *Gardens of Croatia* under which you can also find products of more than 40 small domestic producers and family farms. All products under this brand are 100% domestically produced and are available on SPAR's shelves throughout the year depending on the season (Spar, 2023).

5. CONCLUSION

Small producers in the Republic of Croatia often represent key actors in the local economy, especially in the sectors of tourism, agriculture, and food production. An example of successful small producers are family farms (OPGs) that produce traditional products, small family wineries that rely on local grape varieties, and, on the other hand, startups that represent small companies of high

innovation that use digital platforms for sales and marketing. Creating an enabling environment for small producers is essential for any economy and requires coordinated action by the government and local community through business incubators, educational institutions, and financial institutions.

Measures should be adopted to facilitate access to finance for small producers, encourage upskilling and training, and facilitate cooperation between small producers and large corporations. It is necessary to continuously improve the business environment and regulatory framework to facilitate the launch of new and the development of existing small producers. Understanding and supporting their needs by competent institutions and identifying the challenges and opportunities they face is crucial to creating an environment that will guarantee their long-term sustainability. Small producers in the Republic of Croatia deserve special attention and support in business to be able to make a pivotal contribution to the national and global economy.

Retail chains have recognized the needs of consumers in the Croatian market and have an increasing number of domestic products from small Croatian farms in their assortment. In order to win over consumers and manufacturers, retail chains carry out marketing campaigns by which they want to involve domestic producers in their business process. Hypothesis H_1 – *Retail chains use marketing campaigns to promote small domestic producers* has been confirmed. The subject of future research could be the recognition of these marketing campaigns among consumers and manufacturers and research on the problems faced by small producers when placing products on the market.

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Virtuality of Economy as a Segment of Postmodern Theory

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Hyper reality;
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Abstract: *The virtuality of the economy is an implication caused by the transformation, so it represents a kind of transition from the modern to the postmodern period, that is, it is the period in which today's world exists. In the postmodern period, reality disappears or transforms into hyper reality, which is, in fact, a model of reality or a so-called simulated environment. The basic premise, that led to the realization of this research, was, in fact, to make an in-depth analysis of the real space versus the virtual space and its direct impact on the economic power of companies in modern globalization conditions. Space, as a physical dimension, is perceived by the human mind as a visualization of something that exists materially, measurable, defined, something that surrounds us and with which we coexist in an interactive compact whole. This concept will be the initial point from which research will be done to reach the virtual space, as a specific redefinition of the reality of the space in which man exists, perceives it at the lowest level, with materiality taking on a culminating character. First of all, the inductive-deductive method was used, and the analytical method was used throughout the research because the formulation of the conclusions derives from the analysis of the problem - the virtual space and its economic power. To make the comparisons between the real economic environment, on the one hand, and the virtual space, on the other hand, the comparative method was used.*

1. INTRODUCTION

The most radical change that has manifested itself in recent decades in the economy is the emergence of information, the so-called new or digital economy, and therefore the virtual space in which information is produced, distributed and consumed. The basic premise, that led to the realization of this research, was, to make an in-depth analysis of the virtual space and its direct impact on increasing the economic power of companies in the modern globalization conditions of business communication. Hence, the definition of space and time, as metaphysical and economic categories, affirmed its dominance, supported by the permanent development of information and communication technologies. According to the perceptions of many scientists, theoreticians and philosophers, who gave the first definitions of real space, it can be said that it is empirically given, and can be sensed. Unlike the real, the virtual space (which does not negate the real) implies a dematerialization of the world, that is, a logical projection of the evolutionary mind. Virtual space is an extract, i.e. an essential product of the communicative act. With the acquisition of communication sovereignty, users today take advantage of the multidimensional virtual space, whereby information becomes an undeniable resource for increasing the economic power of society in general.

In that context, **Baudrillard (1985)**, emphasizes that if the industrial age was characterized by an explosion of goods, science and technology, then this semiurgical society is characterized by an implosion of the boundaries between the real and the hyperreal. Namely, network markets

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today are open to all companies, but only a fraction of them use the benefits of e-commerce. Specifically, those companies that use EDI (indicator of concentration of buyers and suppliers) are more easily involved in business-to-business electronic commerce (which are mostly companies from the automotive industry, computer equipment industries, etc.), so their benefits are projected through: the reduction of administrative, transactional and operational costs (using just-in-time deliveries, on-line sales, TQM, know-how, etc.), the achievement of diversification of products and/or services, the reduction of production cycles and creating space for innovation (through partnerships and cooperation in defining ideas, using intellectual capital and adopting new knowledge), increasing transparency in price formation, etc. The series of transactions between these companies is called a supply chain, so adding new values increases the opportunity to reduce risks and achieve greater efficiency, effectiveness and profitability. As [Kraft and Truex \(1994\)](#) stated the virtual organization renders services as if it were in a traditional physical setting (such as a bank, brokerage house, or retail outlet) or via traditional media (e.g., paper or voice negotiation). The marketplace may be wholly electronic: the product may be made by other organizations, brokered, and serviced by still others. In this way, it is possible for companies, through the use of virtual space, to optimize production schedules, and communicate with suppliers in real-time, while eliminating large and complex (paper) documentation, controlling the entry of new companies into the market. and the business procedures of the competition are monitored as well. According to [Lacan \(2019\)](#), in a numeric world, there is no specific model to manage, and future management practices remain unknowable. Despite such uncertainty, there is a way for business leaders to prepare their organizations for the future: by developing the capability to understand the requirements of the digital age and to adapt to its consequences.

The ability to simulate business processes, the appearance and use of the pixel with its convenient financial construction, then existing virtual business games, as well as a series of other application programs ensure that companies balance supply and demand, reduce inventory, meet expectations of consumers, test business decisions and coordinate the way to perform in the network market. All of that contributes to increasing the economic power of both companies and society as a whole. But at the same time, it must be emphasized that there is a huge risk of taking over certain technological solutions from a certain potential competitor. So, postmodernism is the beginning of a new era based on hyper identity and hyper value, where everyone defines themselves according to the code in which they recognize themselves. As with any theory, [Elaati \(2016\)](#), will state that the theory of Postmodernism has pros and cons just like any other cultural phenomena and theories, and the rest of the curriculum of literary criticism. The pros Postmodernism, its liberation movement aimed at freeing man from the world of illusions and myths, and freeing it from the domination of mythology. However, the most significant cons of postmodernism are reliance on the idea of disruption and destruction and chaos, it does not offer a realistic alternative to human culture and practical, and it's hard to apply the perceptions of Postmodernism because of its whimsicality and extremism.

2. REDEFINING REAL SPACE

Real Space, as a physical dimension, is perceived by the human mind as a visualization of something that exists materially, measurable, defined, something that surrounds us and with which we coexist in an interactive compact whole. This concept will be the initial point from which research will be done to reach the virtual space, as a specific redefinition of the reality of the space in which man exists, perceives it at the lowest level, with materiality taking on a culminating character. We become aware of the real space gradually and it becomes an integral part of our existence. But that

phenomenon (the space) in which we exist seems to be intelligible on its own so that we do not feel its enigmaticity, because we do not examine it enough. In this context, we start from the assumption that we exist in a certain space and a certain or defined time, and hence our existence can be very clearly defined. We exist within a limited framework of real space that defines us as subjects, and as such, we act with the things that are given to us perceptually within a completely limited framework and at a specific time. This simultaneous existence repeats itself in the same way and according to the same principle. But the human mind does not function on a bodily, instinctive level, so to make a simple conclusion I, as a subject, perceive the world and the objects in it as objects. This is a simple interaction, which at first glance seems sufficient to explain human existence and the existence of the real space in which they act.

Space, as a metaphysical dimension, appears much earlier, in the discussions of many ancient philosophers who define it in different ways ontologically. Among the pre-Socratics, we can mention Anaximander (600 BC), according to whom the apeiron is taken as the principle for the existence of the world, and according to later investigations, what he defines as an apeiron is identical with today's attitude towards virtual space and in general about the existence of the critical mind level. What is characteristic of the Apeiron is that its determination takes a completely unexpected turn in philosophy, and it is precisely for this reason that it was mentioned in this context. That by which the apeiron is defined is not sensuous, immortality and imperishability indicate that it is timeless and spatially quantitatively limitless. It signifies a denial of internal boundaries and resembles a kind of primitive chaos, the living matter from which all things arise. Plato (400 BC), on the other hand, initiated virtuality 400 years ago, before our era, and according to him, the world we live in is only an illusion or a shadow of the real world, the world of ideas. Plato confirms this in his allegory of the cave. What people see during their lives are only shadows and images of the real world, that is, the world of ideas. The world in which man exists every day is a world of illusions, perceptible by the senses. Sensory perception gives a variable and relative statement about the things around it, and what is essential are their ideas. Plato makes a very important distinction between the world of sense—consisting of things that arise and perish—and the world of ideas, or the real world in which things appear as they are in themselves. Things in the sensory world are material, but doomed to perish, they are only copies and imitations of ideas that are immaterial.

At the same time, a very important category for the virtuality of reality appears, which is dematerialization, as a key term in the virtual space. Dematerialization can be illustrated as the absence of matter, limitlessness in existence, and astral projection...when the material disintegrates, and what is extracted from it is the astral, i.e. the idea in Plato or the virtual, which as such rises to a higher level, contemplation of the mind. Space exists as an abstraction of the mind. This is best explicitly explained by Kant with his conclusion about the existence of two pure forms that arise from rational intuition, as principles of a priori knowledge, namely space and time. So space exists independently of civilizational empirical experience. Space, according to Kant, is empirically real, and transcendently it is the ideal form of sensibility. So, space can be understood as the form of an object that is empirically given, that is, an object that can be sensed. But it can only be postulated, but it cannot be proven. Boundedness is an empirical category with material characteristics, and unboundedness is a virtual dimension projected by the mind. Virtuality surpasses earthly ones, i.e. physical limitations. The most powerful metaphor for virtual space is the dematerialization of the world. In the virtual space, the spirit, as an immaterial category, is transcended by the body, as a material category. Virtual space is a logical projection of the evolutionary mind. Therefore, virtual space is a parallel world in which everything is possible, but nothing is accidental.

Man exists in a limited space and time, which are created by nature or God, he exists at a low level of observation of things around him, i.e. in the subject and object relationship. However, the evolution of the mind implies the emergence of interaction between one subject and another, and virtual space appears as an extract. Evolution is a process of creating more and more complex and sophisticated theories about the world in which we exist. Here, again, the question arises: does the world exist outside and independently of us, does it exist by itself or is it only a projection of our mind and exists only for us. That is the eternal dilemma between realists and anti-realists. Namely, space has been a topic of interest among philosophers, scientists, and researchers for much of human history, and hence it is difficult to provide an accurate and clear definition of it. Virtual space does not negate real space, it just redefines it through a higher mental construct. Realspace dematerializes and acquires a new dimension of virtuality, which is perceived by the human critical mind. The virtuality of the space opens up new aspects and contents for the existence of man and is only the beginning of a completely different world in which he (the man) uses his potential, and this world offers him enormous opportunities for creation and action. However, the virtual space depersonalizes the person, i.e. it reduces him to a code, a code, a data, a sequence of messages that he sends and receives. On the other hand, a person can, by changing his identity on the network, either completely lose his sense of self or shape his authenticity. A basic question that arises is: who are we while we are in the virtual space, and who are we while we are in reality, i.e. are we finding ourselves or are we losing ourselves?!

3. VIRTUAL BUSINESS GAMES AND SIMULATING BUSINESS PROCESSES

Existing in the postmodern period, simulation appears as a primary unit in social experience. Simulation can be defined as the process of forming a certain model that corresponds to reality and conducting an experiment on that model. It is, in fact, a sublimation of the contents of several definitions of simulation, so a large number of theorists agree with this definition. According to [Best and Kellner \(1996\)](#), at the same time, the model can simulate a separate social, economic, social situation, etc. In a given society of simulations, models or codes shape experience and erode the differences between each model and the real state. Hence, all social games are designed almost on an identical principle, namely on the principle of simulating real life. These games are also known as business simulation games & tycoon games. The more identical the simulation is to real life, the better the game. So, the more real segments, such as, for example, material goods (property, cars, money, food, clothes), i.e. immaterial goods (for example, education, culture, religion, etc.) are represented, the more functional the game is. Many virtual games stand out with their design, content, interestingness and interest, and some of them are: blue mars, empire of sports, frenzoo, friends hangout, moove, sim world and many others, but we single out second life, as a game with the most residents (Residents), namely 5,724,413 million with the same number of AVATARS in that virtual world. Virtual games, which simulate real life, are differentiated from virtual business games mainly by the goal they want to achieve. Namely, the purpose of simulating real life in any virtual game is not precisely defined, unlike virtual business games, which are a kind of experiments on a separate economic phenomenon, to obtain certain quantifications for it. Virtual business games can have an educational character and serve as programs for many business trainings, in the fields of management, finance, human resources, etc. In that sense, a large number of universities have already implemented some of the existing virtual business games in their educational process. The most popular virtual business games that can be played online are: Hollywood Stock Exchange, Forevex, Tycoon Online, Kapilands, Industry Tycoon, Virtonomics, Kapi Regnum, Informatist, Taxi Mogul, Wall Street Survivor, Simunomics and so on.

These virtual business games differ from each other according to the goal they want to achieve, which refers to different segments of the economy. Thus, certain business games simulate a stock market (for example, Wall Street Survivor) in which stocks, bonds, options, or futures contracts are traded, i.e. they are sold, and bought, their growth or decline is monitored, the diversification of the portfolio of virtual companies, etc. At the same time, the large number of players establish interaction relations, control the processes of trade exchange and find new impressive ways of profiling the business and designing appropriate strategies for performance on the real stock exchanges. The games, furthermore, can aim to simulate the construction of one's own business, then the production of separate products, the placement of the products, one's own strategy of action, marketing, finance, etc. They can also serve to train future entrepreneurs, depending on the goal set in the business simulation. One of the business games, which was already mentioned, Virtonomics Economics Game Online, is a complex game that combines logic games, business strategy, finance, and products in its structure, that is, complete management of a separate real economy is implemented in it. Virtonomics Economics Game Online is a virtual business simulation that is played across more than 40 countries in the world. Players cooperate, compete, form partnerships, establish communication links, and exchange experiences, just like in the real business world. The advantage of such business simulations is that they are played virtually, the time involved in the game is no longer than a few minutes a day, and the risk of going bankrupt is not identical to real bankruptcy, so for those reasons, these simulations can be a kind of training for future managers, where they have the opportunity to test their strategies and their judgments in the business world, develop business vocabulary, understand economic principles and rules, and all this before starting a business in the real world. According to Dow (2002), as such postmodernism ushered in constructive developments in thought which had particularly important application to development economics: an awareness of the diversity of experience, understanding, and discourse – the very subject matter of development economics; an awareness of the need to take account of different types of analysis in formulating policy; and an awareness of the limitations on outside expertise.

4. VIRTUAL SPACE AS A COLLECTIVE CONSCIOUSNESS

The economic power of the virtual space is dynamically increasing, so that today it represents some kind of a new locational paradigm, which provides communication links, and its economic form exceeds all modern human expectations. But what is also rapidly expanding and increasing, and that in a negative connotation, is the emergence of collective consciousness or on-line and off-line consciousness, which represents the dichotomy between technology and society, during which one's own identity is lost. Personality, alienations, individuality, and fragmentation of identity are overcome and a completely new form of existence is obtained, which is characterized by virtual identity, virtual communities, and virtual social matrices of a parallel world, i.e. a world in which the social moment is neglected or is defined in a completely different way. This is a unique situation where the development of technology initiates negative consequences on human identity. Physical existence is only a form that should provide integration and collective consciousness that will impose itself over all that physically exists. Hence, the opinion of René Descartes, who believes that consciousness and science are never close friends, is completely compatible. Science always ignores the relevance of human consciousness. But this thinking of course refers only to the sociological identity of man, as a complex category, because the virtual space, in the last instance, is a step forward in the visualization of new spaces, i.e. the new worlds. The Internet is a collective memory, which people use according to their needs and desires. Social networks, which appeared almost at the same time with the emergence of

the Internet, (such as, for example, Facebook, Twitter, Skype, MySpace, etc.) represent a virtual place where communication between people takes place. They are a kind of crowd of individuals, grouped according to some goal, but the goal does not always have a definite meaning. According to Le Bon (1997), the conscious person merges with the feelings and ideas of the group, and thus united individuals, as a whole, are directed in the same direction. A collective soul is formed, which is temporary and shows clearly defined character traits. What everyone can state is that this communication is easy and simple and everyone can use it, because it is a step forward in terms of speed, efficiency and quality in the transmission of information. But what constitutes a sociological problem is the loss of personal identity in that mass communication, because human identity is not a set of simple words and images. Individuality, in this case, passes into a mass homogeneity or networked individualism, whereby the Internet acquires a transmission and procreative function. If the transmission function contributes to the breakdown of individualism, then the procreative function expands the boundaries of creativity among individuals, so as a result, the re-rooting of new social ties and relationships occurs. Hence, it can be concluded that the emergence of collective consciousness in the virtual space, in addition to negative connotations, also has positive impacts. So, in addition to the fact that the emergence of such a collective consciousness has a negative impact on the creation of man as a complex person or as a machine that produces clones, on the other hand, it also provides an opportunity for modern man to manage and balance his life in the functional virtual space. Bazrakar et al. (2014), found the effect of post-modernism on the paradigm in various fields:

- As a philosophical essentialist who criticizes wisdom assumptions and modern humanistic enlightenment.
- Or simply, as a specific time range that contains the view and all conversations that agree or disagree with such an attitude.
- •Pass from the simple notion of knowing the probability of the world toward the belief in the reality of its complex and multiple.
- The transition from the hierarchical world to a multipolar world order.
- •Transition from the world's imagination as the embodiment and machine to looking at the world as a visual shape.
- •Emphasizing the uncertainty of the world instead of the belief in the stability of the world and predictions based on previous assumptions.
- Pass from the stage of belief in the direct cause-effect and one-way relationship and achieve the stage of the effect of belief in the rotational and reciprocal cause-effect (emphasis on nonlinear relationships).

5. COMPARATIVE ANALYSIS OF THE VIRTUAL AND REAL ECONOMIC SPACE

The virtualization of the economic real space is a kind of implication of the information and telecommunication development and occurs as a consequence of the new conditions in which companies exist. A prerequisite for it to be the space of a completely new economy is social virtualization, which means that every segment of human existence gets a new status in this space, as it happens with human action itself. Hence, the new economy is a consequence of that way of functioning according to new rules and principles. The old industrial economy functions in a real economic space, in a certain time and space, according to certain principles and rules, in which the main role is played by physical capital. According to Best and Kellner (1996), the dynamics by which modernity produced a new industrial and colonial world can be described as 'modernization' - a term denoting those processes of individualization, secularization, industrialization, cultural differentiation, commodification, urbanization, bureaucratization, and

rationalization which together have constituted the modern world. Such an economy is dominated by physical, as opposed to virtual, existence, which is now becoming the basic driver and motivator of the new economy. The virtual economy has been promoted spontaneously, quietly and intensively in a space that until some time ago was completely unknown to users, as well as to powerful companies in the world. In the race for profit and position in the global market, companies have adopted a different concept of action, which is the main difference between virtual and real economic space. According to [Uygur and Akyo \(2019\)](#), the Postmodern approach has developed quality circles, project groups, new methods and techniques of doing business in contemporary organizations and has created new and more diversified products. Postmodern organizations have structural characteristics identified by post-industrial society or post-fordism. Postmodern organizations employ differentiated structures, niche marketing strategies, highly skilled workers and make extensive use of flexible production systems.

This new concept of action implied a complete reconceptualization of companies, mainly in their organizational structure, human resources management and in general the overall market-oriented strategy of business entities. The strict hierarchical organizational structure in the old economy is now being replaced by a democratic organizational structure, with human resource management becoming crucial to the success of companies. What claimed to be a key mechanism in the old organizational structure was the hierarchical arrangement of the company manager and the rest of the management team. Such a mechanism required that attitudes and strategies be accepted without reservation, and only because they were imposed by the management function, so it represented a closed system that has no place in the virtual economy since knowledge and intellectual capital are the main driving force of modern companies. Linear opinion, as an essential feature in the structure of companies today, is being replaced by dynamic cyclical opinion, and the main goal is to achieve the highest possible creativity, which, of course, will contribute to greater economic growth, development and success. The new strategy of companies operating in the virtual space imposes new attitudes not only inside the company but also externally towards consumers, customers and stakeholders. The psychological aspects in the virtual space are completely changed and a specific, i.e. greater responsibility and expectations from all employees in each company is initiated, while the manager is responsible for motivating and stimulating the employees. According to [Clegg and Kornberger \(2003\)](#), the virtuality of the economy is an implication caused by the transformation, so it represents a kind of transition from the modern to the postmodern period, that is, it is the period in which today's world exists. As such a paradoxical state of becoming rather than a predictable state of being can arise wherever whatever kind of modernity has been normalized. Which begs the question, of course – what is modernity? Well, without being too paradoxical, modernity is a state of being with little sense of paradox, small space for irony, and precious little space for reflection. It is one where the struggle for hegemony is dominant in its confusions and contestations, as the old orders refuse to die and the new orders struggle to be born. As [Linstead \(2004\)](#), stated pre-modern approaches, tending to be based on superstition, myth, magic, religion, and limited conceptual structures are one response. Modern approaches based on rationality, logic, order, scientific objectivity, calculation, and measurement are different but related approaches.

Postmodernism is an era of transformations in all segments of society, that is: socioeconomic, cultural, political, or in general the entire existence of humanity, during which it acquires a completely different essence. This postmodern postulate has radically changed aspects of living. According to [Lacan \(2019\)](#), the postmodern approach offers an efficient method for understanding current reality in a rapidly changing world; and since the world is a macrocosm of

many parts, the postmodern approach leads to understanding its microcosms, including the organization. So we can finish with the statement of Cullenberg et al. (2001), that perhaps then postmodernism in economics allows for a restatement of Samuelson's paraphrased maxim: funeral by funeral, economics does become other. Postmodernism cannot, and will not, promise "progress" in economic knowledge as a result of all that repositioned digging. All it can do is show that even if the quest for progress is dead and buried, still the excavation goes on, and transformations of this different terrain present new opportunities and new discourses for economic knowledge, funeral by funeral.

6. CONCLUSION

Many theorists argue about this transformational phenomenon, considering it from different aspects. In the postmodern period, reality disappears or transforms into hyperreality, which is, in fact, a model of reality or a so-called simulated environment. This hyperreality is more real than reality itself because implosion is a characteristic of processes. It is precisely this concept of implosion that is characteristic of postmodern theory and the consequences it has on the economy. If the industrial world is characterized by an explosion of goods, sciences and technology, then this semiurgic society is characterized by an implosion of the boundaries between the real and the hyperreal. Virtual reality is hyperreality composed of models and simulations of reality. Virtual space and its economic power are induced precisely through those models and simulations, where information, signs and codes are the material for the financial construction of this virtual economy. The transformation that has taken place and is increasingly being implemented in the economy is, in fact, a new aspect of perception in which the meaning gets a new definition. More precisely, civilization in general is built on other values, potentials and characteristics. Hence, postmodernism is the beginning of a new era based on hyper identity and hyper value, where everyone defines themselves according to the code in which they recognize themselves. Finally, one general conclusion can be sublimated that, although the virtual space is untouchable, unlimited and without a permanent location space or computer-generated environment, still the participants in it (individually or collectively) exchange information, contact and develop virtual connections and communications, and it all contributes to strengthening the economic power of the society, and the users to satisfy their desires, demands, preferences and needs.

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Exploring Theoretical Frameworks for Analyzing the Security Behavior of Smartphone Users

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Abstract: *This paper provides a comprehensive exploration of theoretical frameworks essential for understanding smartphone users' security behavior. It delves into the Decomposed Theory of Planned Behavior (DTPB), Technology Acceptance Model (TAM), Protection Motivation Theory (PMT), and Human-Computer Interaction (HCI). Every framework provides distinct perspectives on the implementation, acceptance, and usage of security measures. Through the integration of these frameworks, researchers get an in-depth understanding of the elements that impact behavioral intentions and actions in the domain of smartphone security. The paper also highlights the evolution and expansion of these frameworks over time, emphasizing their relevance in contemporary research and practical applications. Moreover, it outlines prospective directions for research, such as examining the interaction between developing technology and perceptions of security, evaluating the impact of cultural factors on security practices, and assessing the efficacy of interventions.*

1. INTRODUCTION

With cyber threats always on the rise in number and complexity, and considering the usage of smartphones in most of everyday life activities, it has become important to evaluate user's security behavior. This paper explores four theoretical frameworks essential for understanding smartphone users' security behavior, offering valuable insights into the complex dynamics influencing the adoption, acceptance, and usage of security measures in the digital age. The incorporation of the Decomposed Theory of Planned Behavior (DTPB), Technology Acceptance Model (TAM), Protection Motivation Theory (PMT), and Human-Computer Interaction (HCI) provides a foundation for examining and combining these frameworks to understand the complex aspects of users' security behaviors. The Decomposed Theory of Planned Behavior (DTPB) is an extension of Ajzen's Theory of Planned Behavior (TPB) that specifically examines belief structures and intention antecedents to get a more detailed knowledge of the factors influencing adoption and use choices (Taylor & Todd, 1995a, 1995b). The Technology Acceptance Model (TAM) examines user behavior by considering their perception of how easy a technology is to use and how beneficial it is. This model has evolved into TAM2 and TAM3, which provide predictive insights in other fields (Davis, 1989). The Protection Motivation Theory (PMT), developed by Rogers (1975), explores the evaluation of risks and coping strategies, providing insights into how users react to security concerns and manage them. Human-Computer Interaction (HCI) combines cognitive science and human factors engineering, emphasizing iterative design processes and co-evolution between human activity and artifacts (Carroll, 2014). By integrating these frameworks, one may get a thorough comprehension of human behavior

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and the processes involved in making decisions, specifically within the realm of smartphone technology and security. By considering insights from DTPB, TAM, PMT, and HCI, researchers and practitioners can develop more effective strategies for promoting security behaviors and designing user-centered security solutions.

This paper adopts a structured approach across its three main sections. Commencing with “Frameworks Insights”, it explores the foundational theories such as DTPB, TAM, PMT, and HCI. Subsequently, in “Analyzing and Integrating Theoretical Frameworks in Understanding Smartphone Users’ Security Behavior”, the paper delves into how these frameworks intertwine to offer insights into security measure adoption. Lastly, “Future Research Directions” are outlined, identifying critical areas for ongoing inquiry and development, including the interplay between emerging technologies, evolving threat landscapes, and cultural influences. Through a concise exploration of these sections, the paper contributes to the advancement of robust and user-centric security frameworks in the digital age.

2. FRAMEWORKS INSIGHTS

2.1. Decomposed Theory of Planned Behavior (DTPB)

Taylor and Todd (1995a) introduced the Decomposed Theory of Planned Behavior (DTPB) as an extension of Ajzen’s (1991) Theory of Planned Behavior (TPB), aiming to delve deeper into the relationships between belief structures and intention antecedents. This decomposition primarily targets the Attitude, Subjective Norm, and Perceived Behavioral Control constructs (Taylor & Todd, 1995a). By breaking down these components, the DTPB offers several advantages, including the clarification and enhancement of existing relationships, the provision of a versatile belief set applicable across different contexts, and the administrative relevance achieved by focusing on specific beliefs. Moreover, this model directs attention to particular factors that may influence adoption and usage, suggesting potential avenues for system design and implementation strategies (Taylor & Todd, 1995a, 1995b). The original diagram of DTPB, as depicted in Figure 1, encompasses various constructs aimed at understanding the factors influencing behavioral intentions and actions. Each construct offers unique insights into the decision-making process regarding the adoption of specific behaviors. Attitude reflects the individual’s favorable or unfavorable feelings towards performing a behavior (Taylor & Todd, 1995a), while Behavioral Intention signifies the intention to use information technology (Taylor & Todd, 1995a). Compatibility denotes the degree to which the innovation aligns with the adopter’s values, experiences, and needs (Taylor & Todd, 1995a), whereas Complexity represents the perceived difficulty in understanding, learning, or operating the innovation (Taylor & Todd, 1995a). Efficacy indicates an individual’s confidence in their ability to perform a behavior (Taylor & Todd, 1995a), and Facilitating Conditions (Technology) refer to the availability of resources necessary for engaging in a behavior, such as time and money (Taylor & Todd, 1995b). Normative Influence signifies the social pressures or perceived expectations individuals experience regarding a behavior (Taylor & Todd, 1995a), and Perceived Behavioral Control reflects perceptions of internal and external constraints on behavior (Taylor & Todd, 1995a). Relative Advantages denote the extent to which an innovation offers benefits surpassing its predecessor, including economic benefits and convenience (Taylor & Todd, 1995a), while Subjective Norm represents perceptions of whether significant others desire the individual to perform or refrain from a behavior (Taylor & Todd, 1995a). The original diagram of the DTPB has expanded over time to integrate additional constructs introduced by various scholars. These include Availability, Collaborative

Norms, Ease of Use, Future Obligations, Perceived Usefulness, and Usage, among others, which collectively enrich the DTPB framework, offering a more comprehensive understanding of the factors influencing behavioral decisions and actions.

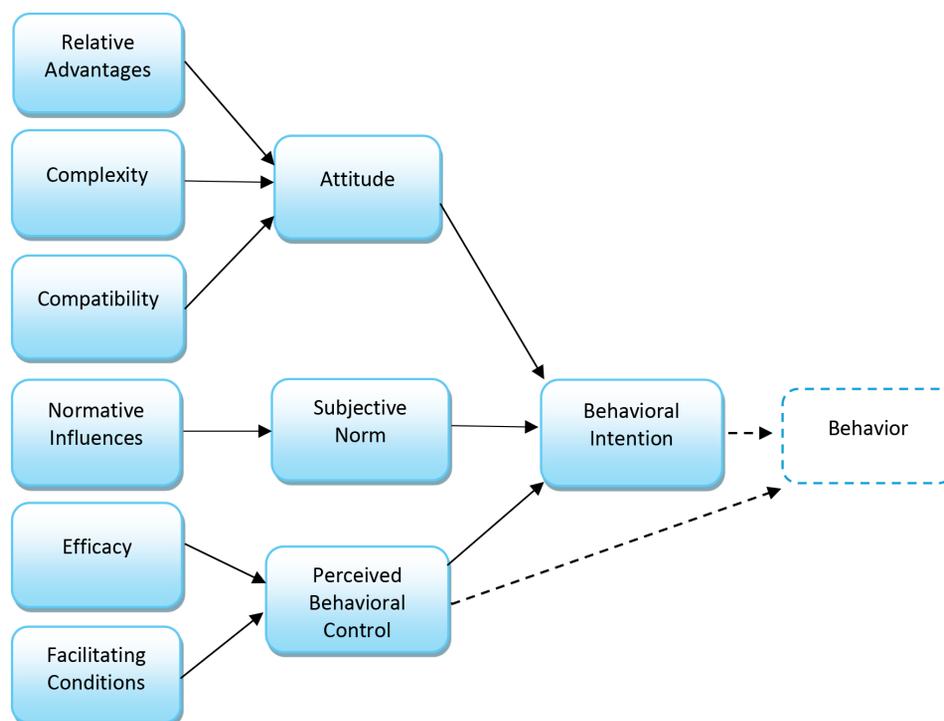


Figure 1. The original diagram of DTPB

Source: Taylor and Todd, 1995b

In a study, Hsieh et al. (2008) introduced the construct of “Availability,” which assesses the accessibility of technology for desired behaviors. Their research specifically examines digital inequality within the LaGrange Internet TV initiative, a project providing free Internet access through cable television. Using the DTPB framework augmented with personal network exposure, they explore post-implementation usage intentions among socio-economically advantaged and disadvantaged users, revealing distinct behavioral models shaped by socio-economic status and personal network exposure. Similarly, Van Slyke et al. (2007) introduced the construct of “Ease of Use,” focusing on beliefs about system simplicity. They investigated the impact of critical mass on computer-based communication technologies like instant messaging, studying adoption and use intentions through perceptions of innovation characteristics. In their study, “Perceived critical mass and the adoption of a communication technology,” the authors highlighted the significance of critical mass in communication innovation adoption and diffusion. Furthermore, Compeau et al. (1999) contributed to the DTPB framework by introducing the construct of “Usage,” measuring computer utilization at work and home. Their study examined individual reactions to computing technology through Bandura’s Social Cognitive Theory, developing a model to explore the influence of computer self-efficacy, outcome expectations, affect, and anxiety on usage. Through longitudinal data analysis, they identified significant relationships between these factors and usage, emphasizing the substantial impact of self-efficacy and outcome expectations on individuals’ responses to information technology. In this way, the continual integration of diverse constructs into the DTPB underscores the ongoing evolution and depth of understanding regarding the myriad factors shaping human behavior and decision-making processes.

2.2. Technology Acceptance Model (TAM)

Information technologies offer immediate and lasting benefits to organizations and individuals, including enhanced performance, financial savings, and time efficiency (Sharda et al., 1988). The willingness of individuals to embrace innovative technology has been a focal point of IS management research since the 1980s, coinciding with the rise of personal computing (Davis, 1989). However, early research lacked empirical insights into user responses to system performance. Prior to the Technology Acceptance Model (TAM), various perspectives sought to advance IS research, emphasizing user involvement in system design and implementation (Franz & Robey, 1986). Another focus was on evaluating system design and characteristics (Gould & Lewis, 1985). However, these studies often relied on subjective performance measures, lacking validation and significant correlation with actual use (Ginzberg, 1981). To address these limitations, Davis (1989) developed TAM based on the Theory of Reasoned Action (TRA), focusing on technology-specific variables. TAM aimed to be a concise framework for examining technology user behavior, departing from TRA's generic nature (Davis et al., 1989). TAM aimed to elucidate the processes driving technology acceptance, offering both theoretical insights and practical guidance for system implementation (Davis, 1989, 1993). Davis initially crafted the model to explain how external factors influence system use through cognitive responses, employing the TRA to explore human behavior in the context of information systems (Davis, 1989, 1993). Davis's approach involved identifying key variables like perceived ease of use and perceived usefulness, which were validated through empirical studies (Davis, 1989). These constructs, rooted in psychological theories like Bandura's self-efficacy, provided a foundation for understanding user behavior (Bandura, 1982). Perceived usefulness gauged how technology improves performance, while perceived ease of use measured the effortlessness of system interaction (Davis, 1989). TAM posited a three-stage process: external factors triggering cognitive responses, which shape affective attitudes toward technology and influence usage behavior (Davis, 1989, 1993). Attitude toward behavior, influenced by perceived ease of use and perceived usefulness, determines the likelihood of technology adoption (Ajzen, 2011). By validating subjective measures and establishing correlations with usage behavior, TAM enhanced both theoretical understanding and practical usability assessments in information systems (Davis, 1989).

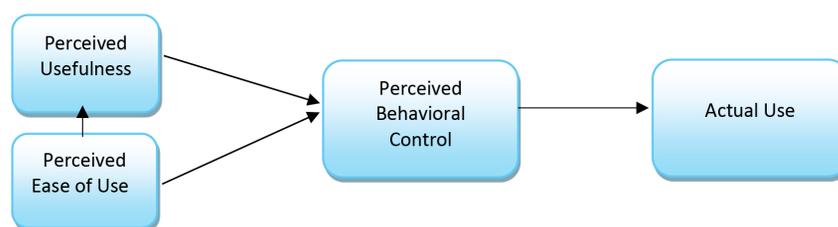


Figure 2. The original diagram of TAM

Source: Davis, 1989

The original TAM diagram, shown in Figure 2, delineates key components: Actual Use, Perceived Ease of Use, Perceived Usefulness, and Perceived Behavioral Control (Davis, 1989). Perceived Ease of Use denotes how effortlessly individuals perceive using a specific system (Davis, 1989), while Perceived Usefulness gauges the extent to which individuals believe utilizing a particular system would enhance their job performance (Davis, 1989). Subsequently, other authors introduced additional components, leading to expansions of TAM known as TAM2 and TAM3, broadening its application scope. TAM and its expansions serve as vital tools across various disciplines and global contexts, offering predictive insights into user behavior. Beyond its roots in information

systems management, TAM finds application in the marketing and advertising realms (Gefen et al., 2003). In marketing, TAM assesses consumer attitudes toward technologies like chatbots and e-commerce platforms, influencing online trading dynamics (Gefen et al., 2003). For instance, it gauges consumer perceptions of online shopping tools, shedding light on purchase intentions (Gefen et al., 2003). Moreover, TAM's adaptability extends to diverse technology realms, including mobile banking, telecommunication, and virtual reality (Al-Gahtani, 2016). While perceived usefulness consistently influences technology adoption, the impact of ease of use varies. For example, the adoption of text-mining tools requires both perceived usefulness and ease of use (Demoulin & Coussement, 2020). TAM's efficacy spans sectors like agriculture and healthcare, explaining adoption patterns of technologies like dairy farming tools and telemedicine (Arkesteijn & Oerlemans, 2005). Across cultures, TAM remains robust, explaining technology acceptance in countries like the Netherlands, India, and Arab nations. Cultural nuances influence TAM's variables, impacting technology adoption behaviors (Singh et al., 2020). Practically, TAM aids vendors in gauging technology demand and assists practitioners in designing user-friendly IT products (Davis, 1989). TAM2 and TAM3 inform managerial decisions regarding technology implementation, guiding pre- and post-implementation strategies to enhance acceptance rates (Venkatesh & Bala, 2008).

2.3. Protection Motivation Theory (PMT)

Rogers (1975) introduced the Protection Motivation Theory (PMT) to delve into fear appeals and human responses to them. Initially rooted in Richard Lazarus's research on stress coping mechanisms, Rogers expanded the theory in 1983 to encompass broader aspects of persuasive communication. Lazarus's exploration in "Stress, Appraisal, and Coping" laid the groundwork, emphasizing cognitive appraisal processes in stress management. He highlighted individual variations in sensitivity, vulnerability, interpretations, and reactions to different events (Monat & Lazarus, 1991). While Lazarus provided foundational concepts, Rogers applied them specifically to fear appeals. Today, the PMT finds significant application in discussions concerning health issues and individuals' responses to health-related diagnoses. Originally conceived to decipher how individuals respond to fear appeals, the PMT posits that people's self-protection behaviors stem from two primary factors: threat appraisal and coping appraisal. Within the threat appraisal process, two critical dimensions are considered: severity and vulnerability, which delineate the magnitude and likelihood of harm within the situation (Plotnikoff & Trinh, 2010). It emphasizes identifying the origins of the threat and discerning factors that may heighten or mitigate maladaptive behaviors. Severity denotes the extent of harm stemming from the unhealthy behavior, while vulnerability assesses the probability of experiencing harm. Additionally, the appraisal considers rewards, reflecting positive aspects of unhealthy behavior. Perceived threat level integrates severity, vulnerability, and deducts rewards. Threat appraisal evaluates how events impact children's well-being, aligning with Lazarus's primary appraisal concept, which examines challenges to children's commitments, goals, or values. Unlike stress evaluation, threat appraisal assesses specific threats, not just stressfulness. It focuses on children's negative appraisals of events, not general response styles. Heightened threat appraisals may lead to negative arousal, coping challenges, and increased psychological symptoms. On the other hand, coping appraisal includes response efficacy, self-efficacy, and response costs. Response efficacy gauges the effectiveness of behavior in preventing harm, while self-efficacy reflects belief in executing the action. Response costs indicate adoption expenses. Coping ability arises from response efficacy and self-efficacy minus response costs, focusing on adaptive responses and threat management. Coping appraisal involves evaluating the effectiveness of the recommended behavior, such as sunscreen use, in preventing adverse effects like premature aging, alongside assessing one's confidence in consistently implementing the recommended

actions (Prentice-Dunn et al., 2009). Richard Lazarus, in “Stress, Appraisal, and Coping,” highlights the correlation between coping styles and specific health outcomes. For instance, managing anger is linked to controlling hypertension. Coping mechanisms impact health through various avenues: altering the frequency, intensity, duration, and patterns of neurochemical stress reactions; engaging in harmful substances or risky activities; and hindering adaptive health-related behaviors (Lazarus & Folkman, 1984). Response efficacy pertains to the belief that adopting a specific behavioral response effectively reduces the threat of diseases, while self-efficacy involves confidence in successfully executing the coping response (Van der Velde & Van der Plicht, 1991). Traditionally, the measurement of behavior consequences links them to the recommended behavior and assesses whether individuals perceive these consequences as likely outcomes of the recommended action (Lwin & Saw, 2007). Among the six factors influencing protection motivation—vulnerability, severity, rewards, response efficacy, self-efficacy, and response costs—self-efficacy demonstrates the strongest correlation, as evidenced by meta-analysis studies (Floyd et al., 2000).

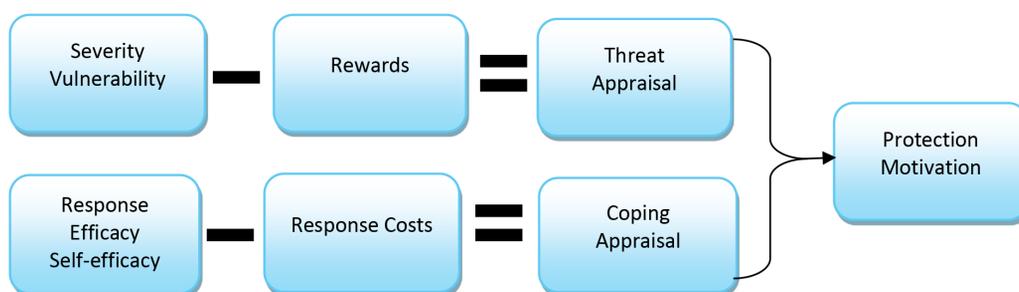


Figure 3. Cognitive process of PMT

Source: Rogers, 1983

The cognitive process of PMT developed by Ronald W. Rogers in 1983, is illustrated in Figure 3. Typically, each significant factor is assessed through survey questions. For instance, Boer (2005) explored the intention of condom use to prevent AIDS based on the protection motivation theory. Traditionally, the protection motivation theory has found application in personal health contexts. A meta-analysis categorized its primary topics as cancer prevention, exercise/diet/healthy lifestyle, smoking cessation, AIDS prevention, alcohol consumption reduction, and adherence to medical treatment regimens. Additionally, more specialized areas like prevention of nuclear war, bicycle helmet use, and driving safety were explored, all related to personal physical health (Floyd et al., 2000). Beyond personal health, the theory has extended into other realms. In the field of information security, researchers have applied the theory to encourage security behaviors in workplaces, employing threats or security policies as motivators. Recent studies by Boss et al. (2015) have revisited the theory’s full range and integrated fear measurement in organizational security contexts. Four areas for improving ISec PMT research were identified: incomplete use of PMT constructs, limited use of fear-appeal manipulations, lack of fear modeling, and focus on security intentions over behaviors. Testing PMT in two ISec contexts revealed promising results, validating the need for enhancement. Their findings strongly supported a process-variance model of the protection motivation theory.

2.4. Human-Computer Interaction (HCI)

The inception of Human-Computer Interaction (HCI) in the early 1980s marked a pivotal moment, initially merging cognitive science and human factors engineering within computer science. Over the ensuing three decades, HCI has evolved rapidly, drawing professionals from

various disciplines and incorporating diverse approaches. Today, HCI represents a synthesis of semi-autonomous research and practices in human-centered informatics. Despite originating from disparate epistemologies and paradigms, HCI exemplifies how diverse concepts can harmonize and integrate into a dynamic intellectual endeavor (Carroll, 2014). The expansion of HCI beyond traditional desktop interfaces exemplifies a broader trend seen across various levels of analysis in technology development. HCI delves into the interactive relationship between human activities and the artifacts, such as interactive tools and environments, that facilitate them. It involves not only understanding and evaluating the interactive technologies people use, but also how these interactions evolve as users adapt to technology, refine their skills, and express new needs and aspirations (Carroll, 2014). Conversely, HCI involves exploring contemporary human practices and aspirations, considering how they are shaped by existing infrastructures and tools. HCI seeks to uncover the intricacies of human activities and envisage new technological possibilities to enhance them. This entails exploring design spaces, iterating through the task-artifact cycle, and ultimately realizing new systems and devices that co-evolve with human activity and needs (Carroll, 2014).

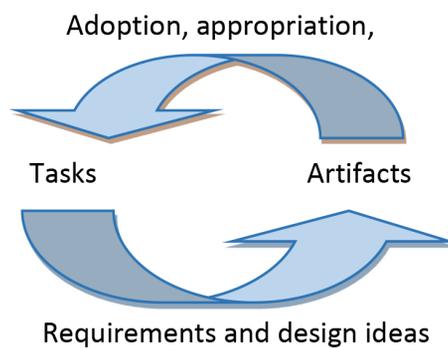


Figure 4. The task-artifact cycle

Source: Carroll, 2014

As illustrated in Figure 4, human activities implicitly articulate needs, preferences and design visions. Artifacts, while initially designed in response to needs, often exceed their original purpose. As they are embraced and adapted, new designs unlock fresh avenues for human action and interaction. This iterative process not only addresses existing needs but also catalyzes the emergence of new human preferences and design aspirations (Carroll, 2014). Viewing HCI within the context of a co-evolution between human activity and technological artifacts offers valuable insights. It underscores the dynamic nature of HCI, where its infrastructure, encompassing concepts, methods, and focal issues, remains in constant flux. The co-evolution is driven by a multitude of contingent initiatives across diverse actors, rendering HCI non-convergent and unpredictable. While progress in HCI is not random, its trajectory resembles the complexity of world history rather than the predictability of physics. This perspective highlights the influential role of individual and collective initiatives in shaping HCI, contrasting with the deterministic nature of physics (Carroll, 2014).

HCI pervades many aspects of modern life, from smartphones to complex healthcare systems. It includes technologies like IoT, which merges physical and digital realms for intuitive interaction. Eye-tracking aids in market research and medical diagnosis, while speech recognition enhances accessibility and hands-free control. AR and VR create immersive environments, and cloud computing offers remote access to resources. HCI continually evolves to meet users' dynamic needs, shaping how we interact with technology.

3. ANALYZING AND INTEGRATING THEORETICAL FRAMEWORKS IN UNDERSTANDING SMARTPHONE USERS' SECURITY BEHAVIOR

Integrating theoretical frameworks in understanding smartphone users' security behavior involves analyzing various models such as the Decomposed Theory of Planned Behavior (DTPB), Technology Acceptance Model (TAM), Protection Motivation Theory (PMT), and Human-Computer Interaction (HCI).

The DTPB, an extension of Ajzen's TPB, breaks down constructs like attitude, subjective norm, and perceived behavioral control, offering insights into adoption and usage decisions (Taylor & Todd, 1995a). It evolves by integrating additional constructs like availability, ease of use, and usage, providing a comprehensive understanding of behavioral factors (Taylor & Todd, 1995a, 1995b). Similarly, TAM, rooted in the Theory of Reasoned Action, explores user behavior through perceived ease of use and usefulness, evolving into TAM2 and TAM3 to enhance predictive insights across various domains Davis (1989). PMT, introduced by Rogers (1975), focuses on threat and coping appraisals to understand self-protection behaviors. Threat appraisal considers severity, vulnerability, and rewards while coping appraisal evaluates response efficacy, self-efficacy, and response costs (Prentice-Dunn et al., 2009). It finds applications in health contexts, personal health, and information security, aiding in understanding fear appeals and responses. Furthermore, HCI, emerging in the 1980s, combines cognitive science and human factors engineering, evolving to encompass diverse approaches. It explores the interactive relationship between humans and technology, emphasizing iterative design processes and co-evolution between human activity and artifacts (Carroll, 2014). Each framework contributes unique perspectives to understanding human behavior and decision-making processes in various contexts. DTPB emphasizes belief structures and intention antecedents, TAM focuses on technology acceptance, PMT delves into fear appeals and coping mechanisms, while HCI explores human-technology interactions and design processes. These frameworks, integrated and expanded over time, offer valuable insights into user behaviors, motivations, and preferences. For instance, in the context of smartphone security behavior, DTPB can elucidate factors influencing users' intentions to adopt security measures. TAM helps understand users' acceptance of security features based on perceived usefulness and ease of use. PMT provides insights into users' responses to security threats and coping mechanisms. HCI aids in designing intuitive and user-friendly security interfaces and systems, considering users' cognitive processes and interaction patterns. The continual integration and refinement of these frameworks enhance our understanding of complex human behaviors and decision-making processes, particularly in the dynamic landscape of smartphone technology and security. By considering insights from DTPB, TAM, PMT, and HCI, researchers and practitioners can develop more effective strategies for promoting smartphone users' security behaviors and designing user-centered security solutions. These frameworks serve as valuable tools in addressing emerging challenges and advancing our knowledge of human-technology interactions in the digital age.

4. FUTURE RESEARCH DIRECTIONS

Future research on smartphone users' security behavior could explore the interplay between emerging technologies and evolving threat landscapes. With the proliferation of IoT devices, 5G networks, and AI-driven applications, it is necessary to investigate how these advancements shape users' perceptions of security and influence their behaviors. Furthermore, investigating cultural and demographic influences on security decision-making might provide

useful insights for developing more comprehensive and efficient security measures. Also, longitudinal studies monitoring users' security habits over time may provide a more profound comprehension of behavioral patterns and the variables that influence behavioral change. By incorporating a range of disciplines such as psychology, sociology, computer science, and design, we may enhance our comprehension of the security behaviors observed among smartphone users in various situations. Moreover, researching the effectiveness of interventions and nudges based on behavioral economics and social psychology might provide insights for creating persuasive techniques that promote security-conscious behaviors among smartphone users. By addressing these research directions, both academics and practitioners can contribute to the development of more robust and user-centric security frameworks in the ever-evolving landscape of mobile technology.

5. CONCLUSION

In conclusion, the examination and integration of the Decomposed Theory of Planned Behavior (DTPB), Technology Acceptance Model (TAM), Protection Motivation Theory (PMT), and Human-Computer Interaction (HCI) frameworks provide an in-depth comprehension of smartphone security behavior in the contemporary digital landscape. By synthesizing insights from these frameworks, researchers and practitioners gain useful perspectives on users' perceptions, motivations, and interactions with security measures on smartphones. The comparative analysis highlights the complementary nature of these frameworks, emphasizing the importance of considering psychological, technological, and design factors in shaping users' security behaviors. The insights obtained from these frameworks provide practical guidance for creating user-centric security solutions, improving digital trust, and promoting a safer and more inclusive digital environment as technology progresses and cybersecurity threats evolve. Moving forward, the integration of these frameworks serves as a foundation for further research and practical interventions aimed at addressing the complex challenges of smartphone security and promoting positive user experiences in the digital realm.

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Enhancing Security in the Age of Electronic Public Services in Albania

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Personal data



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Abstract: *The rapid digitization of public services has revolutionized the way government entities provide services to their citizens and businesses. During the last 10 years, Albania has made significant progress in electronic governance through the establishment of the e-Albania portal. Increased accessibility, transparency, time and cost efficiency are some of the advantages of electronic public services. Although this system has radically changed citizens' access and their trust in public electronic services, this transformation has brought significant concerns related to the security of the systems and especially to the protection of personal data. Considering the fact that such systems are the target of many cyber-attacks, makes the security of these systems a very critical component. This paper provides an overview of the progression of digital services in Albania offered by the aforementioned portal. It highlights both the advantages and disadvantages associated with exclusively delivering public services through electronic channels.*

1. INTRODUCTION

Public electronic services, using technology and systems, are like a structure that focuses on making, interacting with, and delivering digital services. On one hand, individuals or users provide their data including personal ones and on the other hand, public institutions assist them with various electronic services. So, this is a mutually beneficial relationship, but it should be guided by clear principles and policies of personal data protection, during collection, storage, processing, transfer, and destruction. At the same time, the benefits of electronic services are growing, the risks are increasing as well and a lot of security and privacy issues and concerns arise.

This paper presents a general background of electronic public services offered by the government of Albania, specifically the case of the e-Albania portal. This unique governmental portal administered by the National Agency of Information Society enables centralized e-services delivery for citizens, businesses and government employees and ensures interoperability of the Albanian state systems and databases through its connection to the Government Interoperability Platform. The primary objective of the portal is to facilitate citizen-oriented, transparent, accountable, efficient, and empowering governance. During the last 10 years, the access and use of the e-Albania portal have shown continuous growth. Over the years, the number of services offered by this portal has increased, along with the number of users. Current official statistics report that the number of electronic services has reached 1,237, with 3,067,531 registered users on the platform. 2,504,280 applications for electronic services have been encountered in December 2023 (NAIS, 2023). Taking into consideration that now 99% of public services in Albania are offered as digital services,

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this has further highlighted the security problem faced by the systems that offer these services. Beyond the positive developments of technology, these systems present some negative aspects, especially those that have to do with the security of personal data.

This paper aims to identify the benefits and challenges of digital services and to observe the users' perception regarding the security of the e-Albania portal through the development of a survey.

This paper is organized as follows. In section number two, the authors have done a literature review regarding e-government. The methodology of this paper is described in section number three. The fourth section of the paper explores the digital transformation landscape of Albania, drawing comparisons with the broader region. Moving to the next section, a comprehensive exploration of the benefits and drawbacks of e-services is undertaken. In the sixth section, the collected data from online and face-to-face surveys are analyzed. Their analysis produces significant conclusions and findings for this paper in the last section.

2. LITERATURE REVIEW

E-Government is the centerpiece of information systems-supported reforms to digitize the delivery of services and the process of governance occurring across all levels of government (ITU, 2008).

It is generally characterized as the use of Information and Communication Technologies by the government in conjunction with institutional transformation to enhance administration structures and procedures (Twizeyimana & Andersson, 2019). It is considered to optimize web-based applications to promote adaptable communication between state entities with citizens and various general sector organizations by redesigning conventional government services to strengthen service delivery and security (Al Smadi et al., 2009).

E-government services in different countries have different service levels since the level of development of each country is different and the habit of using the Internet and the expectations of the citizens from the state vary by culture (Mosse & Whitley, 2009). Digital services promote citizen participation in public administration, enhance citizen awareness of government programs, improve the transparency of public decisions, and reduce corruption (Shim & Eom, 2008). As a result, governments worldwide have worked extensively to approve specific initiatives for the development of e-governance (Deng et al., 2018). Initiatives for e-governance can significantly contribute to the more effective delivery of public services, the strengthening of democracy, the reduction of corruption and the enhancement of transparency (Alam et al., 2023).

According to the UN, e-government is a pivotal factor in advancing the implementation of the Sustainable Development Goals. Public services should be accessible to all, and e-government has to harness existing and new technologies to ensure that.

The implementation of electronic public services, especially in developing countries, although promising, often faces several challenges. These challenges include the lack of a well-thought-out strategy for e-governance, insufficient technological and IT infrastructure, appropriate policies and legal frameworks, organizational issues, cultural factors, and operational costs (Alshehri & Drew, 2011). Privacy is a critical issue in the implementation of e-government in both developed and developing countries. The difficulty of protecting individual privacy can be an important barrier to e-government implementation. Since privacy protections are difficult

to interject once a system has been built, the planning and design of e-government systems must include privacy considerations (Alshehri & Drew, 2011). A comprehensive privacy policy should specify citizens' rights to privacy and mandate that personal data be collected and processed only for legitimate purposes.

Therefore, understanding the attitudes and individual behaviors of users toward the adoption of electronic governance services, especially their willingness to use such services, is a key factor contributing to the successful implementation of e-governance (Kolsaker & Lee-Kelley, 2008).

3. METHODOLOGY

For the study, authors have created and developed a survey about Albanian citizens' level of awareness regarding the e-Albania governmental portal, their usage, and their perspectives on its transparency and security. The survey was developed not only through interviews with users but also online through the Zoho Survey service. The survey was written in the Albanian language and was developed through the period 01.09.2023-30.11.2023. Utilizing a survey consisting of 10 questions, primary data were collected from 400 citizens.

4. DIGITIZATION IN ALBANIA COMPARED TO WESTERN BALKAN COUNTRIES

Digital Governance is a crucial indicator of the well-being of a country's citizens. Notably, the most developed countries in the world are those with the most advanced digital governance. Reports from prestigious world organizations have consistently given Albania high ratings in digital governance, emphasizing its importance as a key indicator of citizens' well-being.

The United Nations Report on E-Government (UN, 2022) evaluates the developments made by its member states and analyzes the efficiency and effectiveness of public service delivery. This report tracks the progress of e-governance development through the United Nations E-Government Development Index (EGDI) and is conducted every two years. Some of the new approaches governments are adopting in pursuing digital government transformation include providing electronic governance as a platform, integrating multi-channel online and offline service delivery, expanding electronic participation and partnerships, strengthening digital capacities to offer people-centric services, and innovatively utilizing new technologies. Albania in the latest report shows an improvement in electronic governance, ranked 63th out of 193 member states.

Table 1. Albania's Ranking Over the Years in the Overall e-Governance Index

E-Government Development Index	2022	2020	2018	2016	2014	2012	2010	2008	2005	2004	2003
Albania (Rank)	63	59	74	82	84	86	85	86	102	110	114
Albania (Value)	0.74130	0.73990	0.65190	0.53305	0.50455	0.51606	0.45192	0.46700	0.37316	0.33998	0.31079

Source: United Nations, 2022

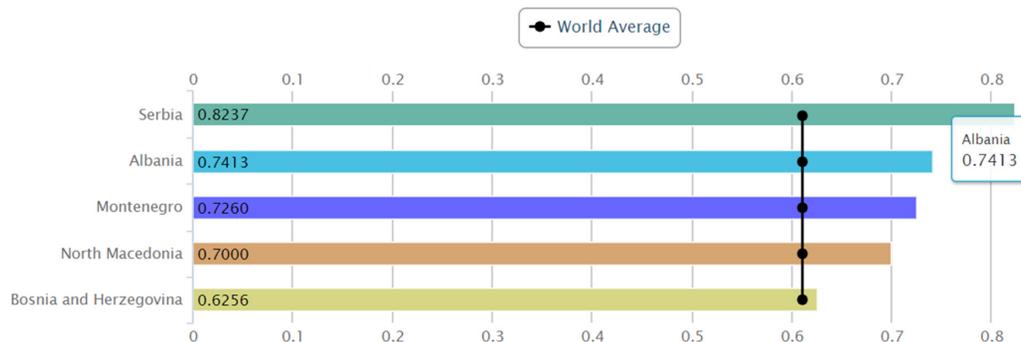
The concept of electronic participation revolves around the use of Information and Communication Technology to engage people in public decision-making, administration, and service delivery. Electronic participation is typically considered a part of e-governance. In terms of delivering an online service through digitization, Albania is positioned at 22th out of 193 countries globally, a significantly high rank compared to previous years.

Table 2. Albania’s Ranking Over the Years in the Overall e-Participation Index

E-Participation Index	2022	2020	2018	2016	2014	2012	2010	2008	2005	2004	2003
Albania (Rank)	22	36	59	55	59	101	86	152	105	97	123
Albania (Value)	0.76140	0.84520	0.75840	0.64407	0.52941	0.10530	0.12857	0.02272	0.03174	0.03278	0.01720

Source: United Nations, 2022

In terms of electronic governance, Albania compared to the WB countries, in 2022 ranks second with a very small difference from the first place.



Graph 1. Electronic Governance Development Index for the Year 2022

Source: United Nations, 2022

Digital Governance Analysis is a method for assessing electronic governance performances, aiming to comprehend how specific country characteristics influence. In the 2023 annual report “e-Government Benchmark” by the [European Commission \(2023\)](#), which evaluates Digital Governance performance, Albania secured the second position in the region after the Republic of Serbia with an overall score of 45. This comprehensive report assesses the utilization of information and communication technology in the public sector, focusing on the development of citizen-centric online public services, the transparency of service delivery, and the integration of ‘key enablers.’

[Organisation for Economic Cooperation and Development \(2020\)](#) compares the achievements of the six Western Balkan countries in the field of digital governance, where Albania was rated the highest among the six Western Balkan countries, positively fulfilling the highest number of indicators (7 out of 7 indicators and 5 out of 6 sub-indicators). Following Albania, Serbia ranks next (fulfilling 6 out of 7 indicators and 5 out of 6 sub-indicators), and North Macedonia comes next (fulfilling 5 out of 7 indicators and 5 out of 6 sub-indicators).

Albania achieved a remarkable milestone in e-governance, topping the region and outperforming European Union member states, as highlighted in the 2021-2022 report by the [European Bank for Reconstruction and Development \(2022\)](#). The country’s ascent is particularly notable in the electronic public services index, where Albania surged from 33rd to 17th place among the 51 nations analyzed since 2015. This significant improvement of 16 positions in e-governance surpasses not only Western Balkans countries but also several EU nations.

5. BENEFITS AND CHALLENGES OF ELECTRONIC PUBLIC SERVICES

Digital services have numerous advantages in comparison with traditional offline services and a lot of benefits for citizens, businesses, and government entities:

- ***Accessibility***
Electronic governance provides equal services to all, regardless of time or location. Platforms like e-Albania revolutionize service accessibility, eliminating geographical constraints and enabling remote 24/7 access for citizens and businesses.
- ***Time and Cost Efficiency***
Digital government services create direct channels for communication, facilitating prompt information exchange and service delivery between citizens and government entities. This connection speeds up the processing of requests and inquiries, resulting in faster responses and resolutions.
- ***Transparency***
To ensure transparency and efficiency, governments should utilize electronic governance channels, reflecting their commitment to acting in the best interest of citizens. This transparency contributes to better public administration and open governance, allowing citizens easy access to information online.
- ***Data Accuracy***
Compared to traditional, paper-based and manual processing public services, digital services reduce the likelihood of human errors, ensuring accurate and consistent service provision. Accuracy is very crucial to guarantee that data are up-to-date and free from mistakes and so to significantly contribute to system and data integrity.
- ***Adaptability***
Digital systems that support electronic services and processes can easily and quickly change and upgrade in response to technological evolution, legislation changes, social needs and government priorities. These adaptive systems give public institutions the ability to update forms, processes and workflows to respond to potential legal modifications and to further improve user experience.
- ***Environmental Impact***
The transition of government processes and services to digital platforms significantly restricts the demand for paperwork. By reducing the need for paper, it results in a substantial reduction in the energy and resources required, thereby minimizing the environmental impact.

Despite the obvious benefits of electronic public services, several challenges and concerns can delay progress in the implementation of digital government:

- ***Digital and Technological Divide***
Not all citizens have equal access to the internet or technology. The absence of Internet access and the necessary technological infrastructure within certain segments of society emerges as a primary barrier to the adoption and success of e-government initiatives. Without the means to connect to the digital domain, individuals are excluded from the convenience, efficiency, and accessibility that electronic governance can provide.
- ***Low Digital Literacy***
Individuals with a lack of digital skills may struggle to access and navigate digital government platforms, leading to reduced utilization of online services. This limitation decreases the potential reach and impact of digital services. Older citizens and also those who live in rural areas may face difficulties in using electronic services.
- ***Protection of Personal Data and Privacy Concerns***
The difficulty of protecting personal data and privacy can be an important barrier to the implementation of electronic public services. Both technical and policy responses may be required when addressing e-privacy issues in an e-government context. The recent

exposure of some databases in Albania, including salary and political preference information, has raised concerns about the impact of privacy in electronic public services. This incident highlights the potential risks of data leaks, affecting individuals' reputations and finances, and posing threats to businesses and government institutions.

- **Security Concerns**

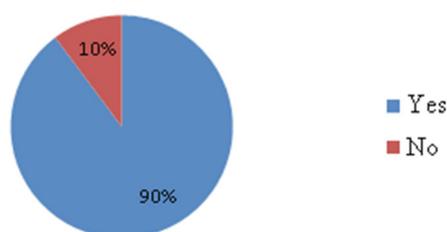
Digital systems and services are the target of many cyber-attacks, which not only aim to deny services but also to steal the data contained in them. In July 2022, state cyber actors launched a destructive attack on the Government of Albania, resulting in severe consequences, compromising servers, disrupting public services, and exposing sensitive information.

6. A SUMMARY OF SURVEY RESULTS

The research employed a dual approach to data collection, utilizing both online and manual surveys distributed among diverse age groups. The initial three questions focused on gathering demographic information (age, gender, and education) while ensuring respondent anonymity. The survey predominantly drew participation from the 20-29 age group (38.2%), followed by the 30-39 (24.4%), 40-49 (17.7%), and ≥ 50 (14.5%) age groups. The under-20 age group had the lowest participation at 5.2%. In the sample, 61.3% were female, and 39.7% were male. The results revealed that 52.7% of citizens had completed high education, 35.6% had secondary education, 6.5% finished elementary education, and 5.2% held a doctoral degree.

The citizen's acquaintance with the e-Albania portal was measured, revealing that 90% of them are aware of its functionality, whereas 10% are unfamiliar and recognize it only by name.

Are you familiar with the functioning of the e-Albania portal?

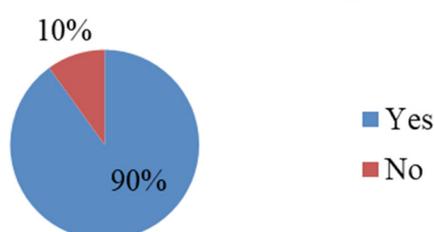


Graph 2. Citizens acquaintance with the e-Albania Portal

Source: Own calculations

In response to the question of whether they own an account on the e-Albania portal, 90% of the citizens surveyed answered affirmatively, while 10% expressed that they do not have an account on the e-Albania portal by the moment.

Do you have an account on the e-Albania portal?

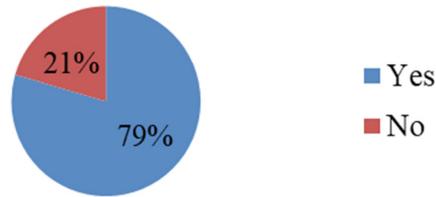


Graph 3. Number of citizens who own an account on the e-Albania Portal

Source: Own calculations

In the next question, participants were asked about their awareness regarding the exposure of their personal or sensitive data. A majority, accounting for 79%, responded positively, indicating that they are aware of the flow, while 21% stated that they are not aware.

Are you aware of recent personal data leakages?

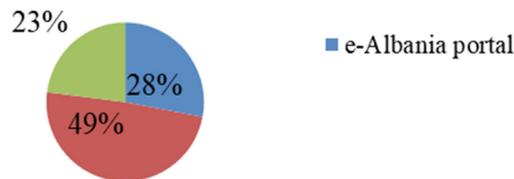


Graph 4. Citizens’ Opinions Regarding the Leakage of Personal Data

Source: Own calculations

Regarding their opinion on where was the point of entry for the data leakage, 49% of the respondents think the data leaks originated from relevant institutions that deal with the processing of this data. 28% of them respond that the breach occurred through e-Albania portal, whereas 23% of them declare that the data may have been collected independently by non-state entities for malicious purposes.

Regarding the cases of data leakage, where do you think they came from?

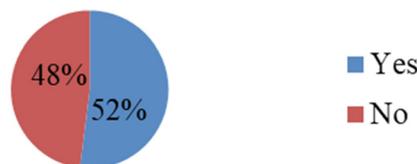


Graph 5. Citizens Opinions Regarding the Causes of Personal Data Leakage

Source: Own calculations

Finally, in relation to the assessment of the system’s security derived from their experience, 52% of the respondents perceive the e-Albania portal as a secure platform. On the other hand, 48% of them express concerns about the security of the portal.

Based on your experience using the portal, do you think E-Albania is secure?



Graph 6. Citizens’ Opinion on the Security of the e-Albania Portal

Source: Own calculations

7. CONCLUSION

Digital services have several benefits and advantages. The extended features and online services of the e-Albania portal have enhanced service delivery and decreased processing times. This has effectively eliminated the need for paper-based services.

Reports from different organizations, consistently award Albania high ratings in digital governance.

Regardless of the survey results, citizens remain aware that public electronic services are the best alternative for service delivery, and they will continue to use them. Citizens believe that the e-Albania portal is still in development and needs further enhancements to improve quality and avoid network overload.

The government should support the acquisition of electronic participation skills among the population by focusing on strengthening the capacities of various groups in society and developing the digital skills needed for people to enable and empower them to engage in electronic participation.

The provision of e-governance services should aim to overcome digital divides by adapting technologies to make them accessible to all user groups, regardless of individual, social, cultural characteristics, or geographic location.

E-Albania portal and the relevant institutions must take further measures regarding the protection of citizens' personal data in processing, transfer and storage. National Agency of Information Society, as the administrative institution of the e-Albania portal, should establish clear agreements with public institutions regarding data ownership to avoid ambiguity that citizens may face concerning the breach of personal data.

Also, strengthening the security of electronic public services should be a priority in order to ensure the availability and integrity of those systems against cyber-attacks and to increase citizen's trust in digital services.

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Innovation in the Tourism Sector – Case of Vlore Municipality

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Abstract: *The rapid development of tourism in Albania has brought not only positive economic consequences, but at the same time, it has also brought out the problems and challenges of the future. Since Vlora represents one of the most important tourist destinations in Albania, this article deals with these problems and challenges for this tourist destination. Tourism represents one of the most significant alternatives for the sustainable and long-term use of these values, and the general social-economic development of the country, especially in unfavorable economic times. This is the reason that tourism was one of the priority sectors in the attention of almost all governments of the post-communist period. In addition, tourism continues to remain one of the most underdeveloped sectors in our country. This article is based on primary data collected from a sample survey of this tourist destination. The article closes with the relevant conclusions.*

1. INTRODUCTION

The development of tourism in Albania is characterized by many different problems. First, there is a general lack of information on the policies, initiatives and projects undertaken or the development of this sector by various interest groups. This context, in addition to weakening the potential for cooperation and synergy, in many cases leaves room for different initiatives not only to serve development but to turn into an obstacle and bring costs to this process. In recent years, Albania has seen a tourist boom, having a significant impact on the development of the economy, but also expressing the level where we are in the field of tourism and the various problems for the development of quality and sustainable tourism. To analyze some elements of the level of tourism development in the municipality of Vlora and the current challenges of this development, this paper was undertaken as a result of a study on tourist businesses in the Municipality of Vlora. Part of this study is also surveying these businesses and data analysis. In its entirety, the methodology that was followed to carry out this part of the work is based on primary sources and was carried out after the collection of secondary data.

The travel and tourism industry must constantly adopt innovative strategies to make tourism businesses more efficient, keep costs low, and maintain a competitive edge. Using technology makes it possible to personalize the customer experience and improve customer satisfaction as issues can be handled in real time. Plus, technology makes it possible to improve operations and reduce costs in many departments (Flipo, 2001). This is also because a sufficiently comprehensive approach has not been followed for the drafting of the national tourism development strategy itself, to achieve a high efficiency of its implementation. Our coastline represents one of the areas with the highest tourist potential, and for this reason, it has always been in the attention of many investors and the prey of many investments, outside of any touristic and environmental plan and standard. Such chaotic development has affected these areas the most. In all cases, these investments are accompanied by impacts on the surrounding environment, which in itself represents the tourist asset, thus eroding the

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tourist potentials together with the benefits that derive from them, and at the same time devalues the investments made. One of the most representative cases that we can mention here is the frenzy of chaotic construction of tourism service facilities; such as hotels, restaurants and apartments in the Golem beach area, in Kavaje. Large sums have been invested in this area, which can already be considered as burnt investments, since, apart from not reaping benefits, they simultaneously destroyed the surrounding nature and the potential tourists of this area. Such investments continue to this day along the Albanian coast, under the same conditions as in the mentioned case. Who guarantees us that these investments will not have the same fate and will not bring the same problems as before?

The innovation process includes the actions of renewal or change. This includes both renovating something that exists and introducing something new. Within the context of business, [Perdomo-Ortiz et al. \(2006\)](#) define innovation as a “dynamic capability” based on patterns of thinking and action that allow an organization to regularly modify the way it operates to improve its effectiveness. Thus, innovation involves taking new ideas from creative thinking and putting them into practice ([Aslanyürek, 1984](#)). The result can be several types of innovation such as product innovations (a new product or service that is new or significantly improved), process innovations (where the production process is changed), information handling innovations (where forms are adopted knowledge management innovations), marketing innovations (the evolution of new marketing methods with improvements in product design or packaging), management innovations (where the way in which a business is managed changes) and institutional innovations (where the structure of an organization is changed) among others. As [Okpara \(2007\)](#) explains, no entrepreneur or enterprise, no matter how successful and large, can continue to hold a leading position if it does not recognize that modern business operates in a world of galloping change that creates new problems, risks and opportunities, and for which resources must be mobilized before changes can make their impact felt. As a result, any established business that wants to achieve growth and sustainability must be able to react to changes while maintaining a competitive advantage, otherwise, they face the possibility of ‘decline’ and ‘bankruptcy’. Therefore, responding to change through innovation is essential if firms and countries are to thrive in today’s highly competitive and connected global economy. As such, innovation is a powerful engine for development and for addressing social and global challenges, and holds the key, in both advanced and developing economies, to employment generation and improved productivity growth through the creation of knowledge and its application and dissemination ([OECD, 2010](#)).

The issue of solid waste management and wastewater treatment continues to be very problematic. Unfortunately, almost all tourism facilities in our country are “adorned” by waste that is carelessly thrown everywhere. This bad vice of ours, not only makes their landscape ugly but also the feeling that the tourist receives and transmits. In addition to addressing the above-mentioned issues, tourism development efforts must now prioritize sectors beyond summer tourism. This approach aims to ensure stability for the industry throughout the year and fully utilize its potential ([Aslanyürek, 1984](#)).

2. METHODOLOGY AND DATA

Based on the primary data collection strategy and built a questionnaire directed at the interest groups in our case are owners, managers, or those in key positions in tourism businesses. The main reason for the selection of interest groups was to fill in the gap that exists from secondary data. The collection of primary data through the questionnaire was carried out using the entire database of tourism companies in the municipality of Vlora, business enterprises from 506 registered in this field, and including the case selection. Determining the number of interviews

was carried out and determined through classic formulas for determining the number of questions where part of the statistics was obtained from the pilot test. Data processing was carried out through statistical processing.

To collect primary data as accurately as possible through the designed questionnaire, we initially secured a list of registered businesses that are the focus of our field study. A pilot test was conducted with 12 businesses from different sectors included in the study. After refining the questionnaire based on the pilot test results, a data template was created according to the final version of the questionnaire.

Data Processing and Statistical Analysis: Data retention and quantity control were implemented to ensure the accuracy of the data collected from the survey.

3. PURPOSE AND WHAT THIS STUDY PRESENTS

The data were entered into the database, cleaned, and checked for consistency. The procedure then continued with their analysis.

Ethics. The study was based on the Ethical Principles and Guidelines for the Protection of Observed Data during Research according to the Ethical Principles of Psychologists and the Code of Conduct of the American Psychological Association as well as the ethical principles of the NGO Ecopana. In the collection and analysis of data, the dignity, autonomy, equality and diversity of all those involved in the survey process were respected (Chheang, 2013).

Conducting the survey. The survey was carried out in the period November 2023 to January 2024. This period outside the tourist season was chosen for the reason that in this period the managers of the tourist units have more time to answer the questions and fill in the questionnaires. Based on the survey theory, before conducting the survey, we carried out the preparatory phase, which is a very important phase. In this phase of the study we built the questionnaire, conceived the study that we were going to carry out and built the preliminary tables of results as well as the database that we thought we would get at the end of the survey, as well as we carried out the pilot study to test not only the questionnaire but also elements of others of the survey.

Construction of the questionnaire. Cognitive actions for data collection represent a rather delicate phase in a statistical study. In this phase, the questionnaire is constructed, the questionnaire is checked, insisting on the fact that the information collected through the questionnaire is confidential, and the types of errors that are possible during data collection are determined. The method used to conduct primary data collection plays an important role in what questions will be asked, how many questions will be asked, and in what order the questions will be asked. Since we decided to interview the respondents (managers of tourism companies) through the face-to-face method, the ordering of the questions was also done according to this interview method. The questionnaire was developed based on a literature review and the adaptation of several existing questionnaires. It was tailored to align with the purpose and objectives of our research, as well as the specific conditions and types of businesses in the Municipality of Vlora.

The constructed draft questionnaire was subject to the comments and suggestions of some experts in the field. For the most part, these comments and suggestions were reflected in the final questionnaire. The constructed questionnaire was subjected to a pilot test where 12 tourism

companies were selected (2 tourist agencies, 2 cruise ships, 6 hotel bar restaurant structures and 2 businesses for providing apartments and rooms for rent). Completing a questionnaire took about 20 minutes. Based on the observations and the difficulties encountered by the tourism business managers regarding the completion of the questionnaire, appropriate improvements were made and the final questionnaire was constructed (De Kadt, 1979). The ongoing actions of data collection after the revision of the questionnaire based on the observations received from the pilot study etc., consisted of the codification of the questions, the registration (disposing of the data), as well as the construction of mock-ups of the statistical tables.

4. RESULTS AND DISCUSSION

The study included 51 businesses in Vlora, represented by different people directly connected to the businesses. The businesses are analyzed according to the main indicators.

Table 1. Distribution of businesses according to the indicators

INDICATORS	Distribution	number (n=51)	% (n=51)
Years of activity	1-5 years	28	54.9
	6-10 years	14	27.5
	Over 10 years	9	17.6
Main Activity	Commerce	8	15.7
	Foodservice	15	29.4
	Accommodation	17	33.2
	Accommodation and food	6	11.8
	Other services	4	7.9
	Handicraft	1	2
Is your business a contractor of another business?	Yes	0	0.0
	No	51	100.0
Is your business a subcontractor of another business?	Yes	2	3.9
	No	49	96.1
The role of the business representative	Manager	28	54.8
	Administrator	4	7.8
	Employed	5	9.9
	Owner	14	27.5
The gender of the business representative	M	15	29.4
	F	36	70.6

Source: Own research

The majority of businesses (54.9%) have been active for 1-5 years, indicating a relatively young business landscape. Only a small portion (17.6%) has been operating for over ten years.

The most common main activities are accommodation (33.2%) and food service (29.4%). Commerce and other services are less common, with handicrafts being the least represented.

All businesses are independent, with none acting as contractors for other businesses. Only a small fraction (3.9%) work as subcontractors.

The most common role for business representatives is manager (54.8%), followed by owner (27.5%). Administrators and employed representatives are less common.

The majority of business representatives are female (70.6%), which indicates strong female leadership in the business sector.

The business landscape is relatively young, with a strong focus on accommodation and food service. There is a notable female presence both in the workforce and in leadership positions. The majority of businesses are independent, not acting as contractors or subcontractors for other businesses.

5. CONCLUSION

Enhancing Albania's tourism sector necessitates a multifaceted approach. Prioritizing innovation within businesses, improving the training of operators and staff, and fostering effective collaboration between public and private agents through regional strategies are paramount. Additionally, diversifying tourism products based on the varied experiences of tourists, understanding their motives and expectations, and promoting innovative entrepreneurial practices will contribute significantly to the sustainable growth and success of the industry. By addressing these key areas, Albania can strengthen its position as a desirable and competitive tourist destination.

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Film Tourism as a Promoter of Tourism Development in Korca Region

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Sustainable tourism;
Personalised experience

Abstract: *Given that it may create jobs and revenue, tourism is being mentioned more and more as a means of stimulating the economy. So, considering this systemic view of tourism and the current state of the economy, tourism-related phenomena become increasingly important in this globalizing world. In order to grow as a tourism destination, places must stand out in a competitive market. Referring to this, Albania is a destination that in recent years has seen a rapid increase in tourism and income. One of the most frequented destinations is Korca Region, but the development of tourism in this destination must be extended throughout the year and be sustainable. This paper intends to analyse whether the implementation of a new form of tourism in Korca Region will be effective in raising sustainable visitor numbers and year-round tourism. A new emerging trend within modern tourism has been dubbed film-induced tourism. Film tourism is a personalized experience that is heavily dependent on the viewer's emotional reactivity, personality, and background (cultural and ethnic), making each visitor's experience unique. This presents a hurdle when it comes to assessing and measuring the industry. This study attempts to define film-induced tourism, as well as to explore the relationship between films and tourism in the Korca Region. The article looks at the general understanding of the phrase under investigation as well as the present tourism profile of the Korca Region. Moreover, we must highlight, that consumer behavior and motivation play a special role in choosing a travel destination, analyzing these to understand tourists' motivations. An online questionnaire was used to conduct a mixed-method study with 70 participants. Five of those participants were contacted to conduct semi-structured interviews. We may therefore conclude that film tourism has a good effect on a location and, by utilizing contemporary technologies, offers passengers novel experiences. It also stimulates local tourism, revitalizes depopulating regions, and strengthens a nation's economy.*



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1. INTRODUCTION

Film tourism has attracted a great deal of attention in the travel and tourism literature since it was realized that cinema may be a major factor in the growth of tourism for many countries. The development of “new images, alter negative images, and strengthen weak images” of a place while serving as the primary tool for tourism promotion determines the impact of films on tourists’ desire to visit a nation (Beeton, 2006). Stories were traditionally passed down from one generation to the next, allowing them to become ingrained in our culture (Dunnigan, 2004). These days, screens are largely how we are able to see those stories (Dunnigan, 2004). Film tourism is a subset of cultural tourism that is primarily focused on travel to film sites that are shown on television and big screens (Bernardi, 2016). The film has been recognized as a way to promote destinations over the years, particularly in the last ten years, since it casts images of buildings, monuments, landscapes, and icons onto a large screen, providing a backdrop for the

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stories portrayed in movies (Bernardi, 2016). Films influence the perception of a destination by exporting customs and information that can entice viewers to come there, helping to transfer a region's or nation's identity (Bernardi, 2016). Based on the production of experiences, film-related landmarks, or the location of filming, a destination's appearance on screen becomes a resource that can assist in diversifying the tourist offer of a site or overcoming seasonality (Bernardi, 2016). In addition to becoming well-known, a place in a movie might gain from the promotion and the impression it leaves on viewers' thoughts (Bernardi, 2016).

2. LITERATURE REVIEW

2.1. Tourism Induced by Film

A nation's tourism industry has the potential to be its greatest ally or worst enemy. In analyzing its effects Beeton (2016) asserts that tourism has the power to unite or divide communities by acting as "a force for peace, an economic and social generator and diversifier, and can bring communities together." In an effort to boost the number of visitors to developing nations, film tourism websites have encouraged travellers to travel to particular nations or destinations (Beeton, 2005). Film-induced tourism, which is a relatively new phenomenon, was previously known as film tourism. According to Beeton (2005) argument, over time, the impact of film tourism can have both beneficial and negative consequences on a destination. Cultural tourism is another term for film tourism. It describes all kinds of travel to places where people can engage in some way with the film industry. Film tourism is an increasingly popular global phenomenon that falls under the broad category of cultural tourism. It is driven by the expansion of the entertainment sector as well as the rise in international travel. All travel to destinations that let visitors engage in some way with the film industry is referred to as "film tourism." Additionally, it is separated into three categories: travel-related tourism, tourism for film promotion, and tourism for tourism induced by film.

2.2. Relation between Film and Tourism

Arriving at a site, tourists do so based on the impression they have of the place from movies and television (Bernardi, 2016). The term "locations of filming" or "venue of recordings" refers to the places where a movie's plot is developed, the locations of movie studios, places associated with the lives of actors, producers, screenwriters, or directors, as well as museums and other film-related resources (Bernardi, 2016). Destinations that think of promoting this form of tourism should take into account the benefits it can bring to the destination and the local community. These destinations should take into account that the further development of this form of tourism will help them:

- To promote the destination;
- To give a good image;
- To increase tourist arrival;
- To give a good destination for films;
- To introduce new places to the world;
- To help the growth of tourism.

Ideally, to achieve sustainable development of this form of tourism, consideration should be given to each stakeholder (group), regardless of the level of interest and/or power held. Sautter and Leisen (1999) provide a simplistic example for identifying stakeholders of tourism planning, which in the case of film tourism would translate into Figure 1.



Figure 1. Film tourism stakeholders

Source: Heitmann, 2010

The degree of involvement and participation in the planning process varies depending on the role and interest of each player in film tourist planning. As illustrated in Figure 2, destination management organizations (DMOs), the local community, travellers, tourism-related enterprises, and the film industry are the main stakeholders that need to be considered.

2.3. Films and Tourist Behaviour

Different people will perceive films in different ways, therefore there is an opportunity to explore a variety of perspectives on human behavior. Films and behaviour are two closely related topics, suggesting that there is a direct or indirect relationship between them. In the pursuit of studying film-induced tourism, it is imperative to delve into the reasons for tourists’ visits to film locations, in addition to more intricate observations like individual and private motives (Beeton, 2010).

The idea of “film tourism” is defined as the ability of a film to affect a person’s perception and desire to travel (Araújo, 2013). The topic of tourism behavior is the emphasis on Moutinho’s (1987) approach to the tourist process. Various elements, including “personality,” “learning,” “motivation,” “perception,” and “attitudes,” influence the behaviour of tourists.

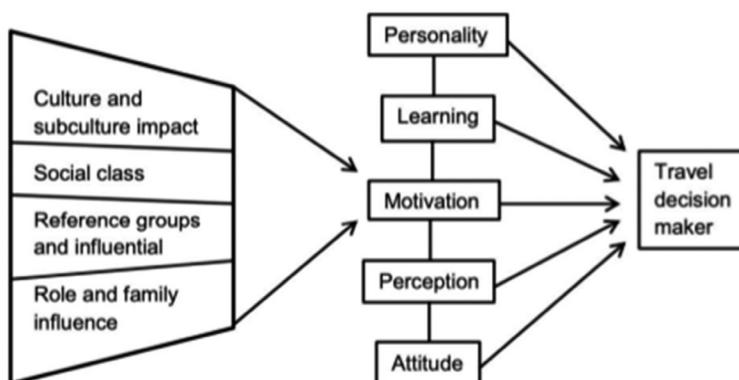


Figure 2. Factors Affecting Personal Travel Behavior

Source: Based on Moutinho, 1987

Travelers’ vacationing behaviour has evolved and gotten more sophisticated as a result of the fact that planning a trip now takes far longer than the actual holiday (Moutinho, 1987). Figure 2 indicates that these behavioural aspects are influenced by an individual’s decision-making

process, which is molded by prior influences and cultural backgrounds. A deeper understanding of how individuals view destination places, learn to travel and consume, make travel decisions, and which personality factors influence those decisions is essential for developing marketing strategies and campaigns (Moutinho, 1987). Furthermore, Moutinho (1987, p. 5) conducted a study of the factors that drive and impact “individuals’ travel decisions; how attitudes are formed; and how various groups affect travel behaviour. Beeton (2016) concurs with the fact that movies have an impact on behaviour, but they also have an impact on the motivation of tourists.

3. TOURISM DEVELOPMENT IN ALBANIA AND KORÇA REGION

The tourism industry plays a crucial role in the Albania economy, and a rise in the number of visitors translates into higher revenue and more job opportunities. In the long run, this increase in tourism numbers benefits mostly Alban society and its communities by filling in the gaps left over from previous decades, aside from the short-term benefits to the country. Referring to the official data in Albania obtained from the Institute of Statistics, the development of tourism in Albania in recent years has seen a significant increase. Based on the data (INSTAT, 2024), 10,155,640 foreign nationals arrived in Albania in 2023—a 34.6 percent increase from 2022.

1,362,511 citizens of Albania and other countries arrived on the country’s territory in December 2023. In December 2022, this indicator was 41.1% higher (INSTAT, 2024).

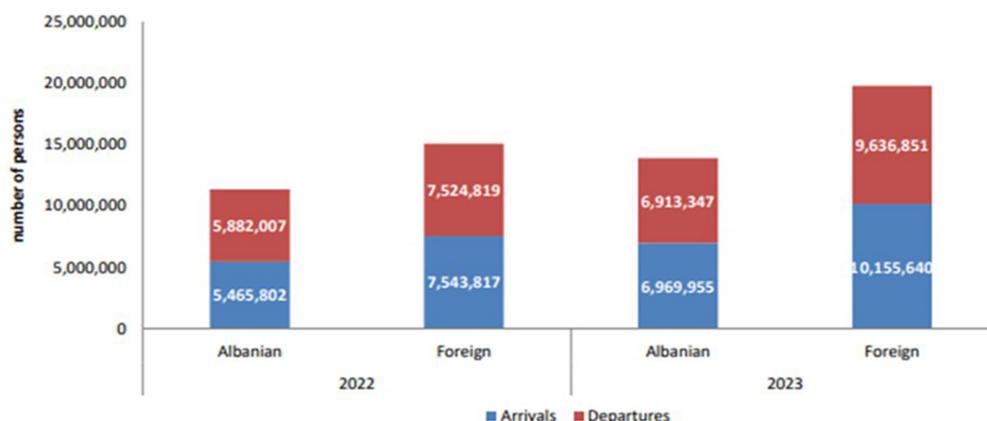


Figure 3. Movements of citizens in Albania, 2022 –2023

Source: INSTAT, 2024

Korce region is one of the most frequented and visited areas in Albania by local and foreign tourists. It is located in the south-eastern of Albania, a country in Europe. Beautiful churches, mosques, museums, and pathways are just a few of the sights and activities to be found in the Korca region. It is close to Greece and North Macedonia.

For the year 2022 (January - December period), there are about 96,940 local and foreign visitors. The city of Korça continues to attract more and more local and foreign visitors, who find the climate, beauty and cultural heritage of this city in the southeast of Albania very attractive.

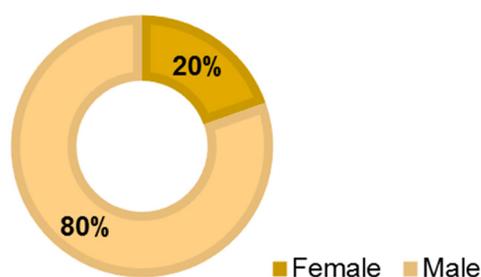
Tourists can enjoy a variety of tourism experiences in the Korce region, including cultural, religious, gastronomic, natural, and white tourism. Tourism in the Korca region, in addition to the rapid development of tourism, some challenges require a proper strategy to be faced. One of the

main challenges is that tourists usually visit the Korce region during holidays or more on weekends. The other days of the week have a lower number of tourists, which brings difficulties for the tourism and hospitality sector. Based on the above, I think that the approach and promotion of a new form of tourism, such as film-influenced tourism, could be a solution to this challenge. As for film tourism, we must mention that in Albania we have only one international film that was recorded in this destination, while the other recorded films belong to the history of Albania at the time of liberation or to the communist regime. As for film tourism, we must mention that in Albania we have only one international film that was recorded in this destination, while the other recorded films belong to the history of Albania at the time of liberation or to the communist regime.

Based on this, it is assumed that the tourists who would visit the Korce region even during the weekdays will be the tourists who are passionate about the film, the nostalgic tourists of Albanian films and the tourists who study the history of the Albanian people through films.

4. THE STUDY RESULTS

To achieve the objectives of this study and to draw conclusions on the behaviour of tourists and if film tourism is a promoter for the development of tourism in the region of Korca, we used the surveillance method which will help us in this direction. Over 25 days, 70 responses to the online survey were collected. Respondents included both domestic and foreign tourists with a specific interest in movies. A range of graphs and tables are used to summarise and analyse the results of the questionnaire in the section that follows. Each figure is also explained, and conclusions are reached based on the body of current material.



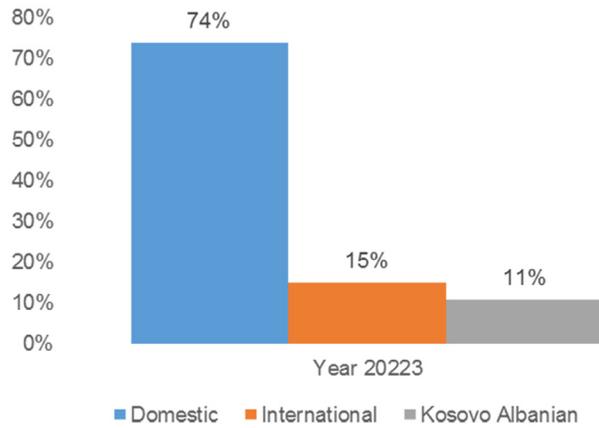
Graph 1. Gender of respondents

Source: Own research

In terms of demographics, there were over 20% of men and over 80% of women. When analyzing the data, these figures will demonstrate a higher feminine point of view as opposed to a male one. In addition, women tend to respond to questionnaires more quickly, which accounts for a large percentage of female responses. Therefore, the majority of the perspectives in this research are those of women.

Graph 2 represents the country of origin of all the participants. Most of the respondents more than 74% are domestic tourists, 15% of them are international travellers and 11% are Kosovo Albanian travellers². This percentage shows that when it comes to film tourism, local tourists are the most interested in answering the questions because most of them may have experienced moments from their childhood that bring you a kind of nostalgia to see the places where these films were recorded.

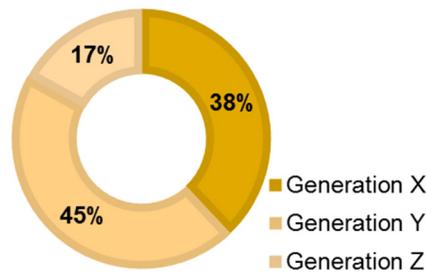
² Kosovo Albanians belong to the ethnic Albanian sub-group who inhabit the north of Albania, north of the Shkumbin river, Kosovo area, southern Serbia, and western parts of North Macedonia.



Graph 2. Nationality of tourists

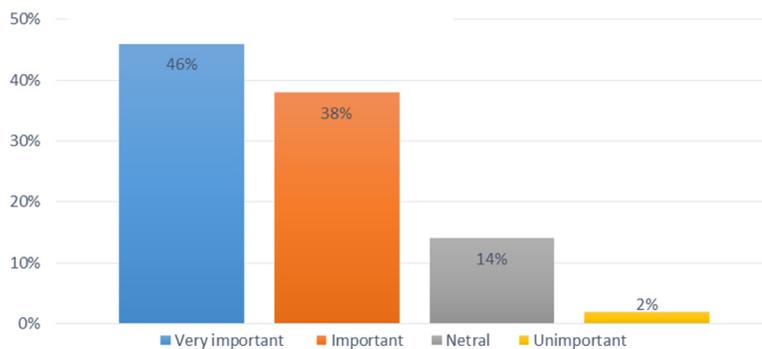
Source: Own research

Additionally, the respondents’ ages ranged from 20 to 75 years old. Looking at graph 3, four distinct generations have been shown according to the participants’ age range. All those born in generation Y (1996–1985), generation X (1975–1963), and generation Z (1995–2013) are considered members of these generations. Therefore, over 45% of the participants are from “Generation Y,” followed by 38% from “Generation X,” and 17% from “Generation X.”As a result, how these outcomes are portrayed will favour the viewpoint of the younger generation over the older one.



Graph 3. Age generation

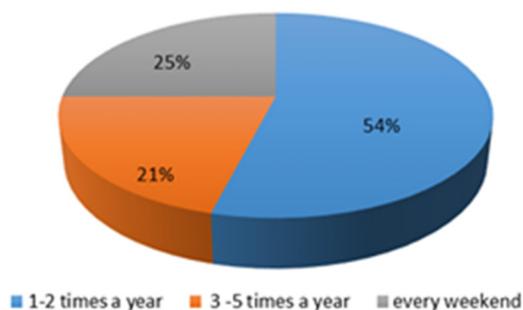
Source: Own research



Graph 4. Importance of traveling

Source: Own research

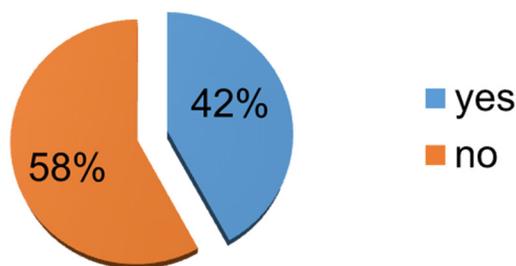
In the next section, participants were asked about their behaviour and attitude towards tourism. The data presented in Graph 4 indicates that a significant proportion of participants (46%) and considered it important (38%) to travel during their free time. This implies that individuals consider taking a vacation anytime they wish to break away from their daily routines. As a result, the majority of participants consider travel to be a significant daily activity.



Graph 5. How often do you travel?

Source: Own research

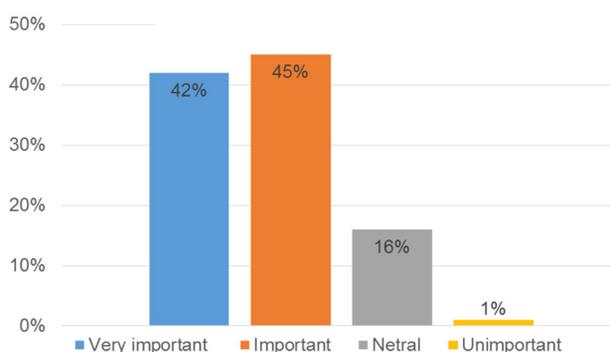
To understand the profile of the tourist, the question of how often you travel, graph 5, the majority of respondents (54%) travelled 1 to 2 times a year, another 25% every weekend and about 21% traveled 3 to 5 times a year. We must also add the fact that after the pandemic the desire to undertake trips has increased, but they are concentrated on a few days of stay.



Graph 6. Have you ever heard of the concept film-induced tourism before?

Source: Own research

The purpose of the following section is to find out whether the respondents have previously heard the term “film induced tourism” (Graph 6) and, if yes, what kinds of tourism fall under this category. On the one hand, the findings show that 58% of respondents had never heard of this concept before, compared to nearly 42% who had.



Graph 7. Importance of film tourism as a motivation to come to Korca

Source: Own research

In Graph 7, we asked the respondents to estimate how important film tourism would be as a motive to visit the Korca region. About 45% of the respondents answered that it would be an important motive that would push them to visit Korca. no less than 42% answered that it would be very important as a motive to visit Korca through film tourism. There were those (16%) who gave a neutral assessment because they came to the Korca region for other motivations.

Semi-structured interviews are used to complete the second questionnaire form. In order to gain a deeper understanding of the subject matter, two interviews have been designed for this study. A total of five individuals have been contacted to respond to the interview inquiries. Two of them are movie tourists who have visited Dubrovnik, the location of Game of Thrones filming. The remaining three responders consist of a travel agent and a tourism sector expert. Furthermore, from these interviews, we managed to get a deeper overview of what film tourism can bring and where it can intervene in the further development of tourism in a destination.

5. FUTURE RESEARCH DIRECTIONS

Future studies in this area are important because there are still a lot of unanswered questions about film tourism. It will also be helpful for those who lack the means to visit a location to learn more about it online. More precisely, the Internet and all the photos published on various social media platforms could contribute to raising awareness among younger generations. Thus, an interesting field of study for the future would be to look more closely at how much a nation's economy is impacted by film-induced tourism both domestically and globally in relation to other nations.

6. CONCLUSION

Korca Region is a destination that has the potential to offer domestic and foreign tourists year-round tourism. This destination can increase the number of its tourists by offering a unique product, and traditional and inherited hospitality between generations. In this destination from the national cinematographic archives, we have discovered a series of national films which were recorded in Korce, which is an initial indicator to think that this new form of tourism can be promoted. Currently, film-induced tourism is a developing phenomenon that has gained popularity; over 42% of those who answered this survey had heard of it. Travel motivation is significantly influenced by landscapes and other site qualities, according to those who have travelled or plan to travel to a film destination. These qualities are also typically linked to pull considerations, in which the movie itself serves as the primary incentive to travel to a certain location. Experts believe that the concept of showcasing a place through film tourism is an appealing and cost-effective way for both domestic and foreign tourists to increase their understanding of the historical and cultural facets of a nation, based on the responses provided during the interview. The profile of tourists who visit the Korce region are those who come during the weekends or who generally book short trips, but this can also come as a result of exhausting the activities that can be offered in this destination in a few days. There is a strong correlation between film and tourism, and film tourism could encourage tourists to travel. This suggests that film tourism plays a significant part in modern tourism. Furthermore, professionals in the industry agree that movies have a significant influence on people's motivation to travel when it comes to destination image and promotion. The results of this study provide a great starting point for many cities' governments, stakeholders as the information provided can help them make informed decisions, by being able to assess the impacts of film-induced tourism clearly.

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Gastronomy at the Crossroads Towards Climate Neutrality: From Counting Calories to Monitoring CO₂ Emissions

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Keywords:

Gastronomy;
Food system;
Climate change;
Climate neutrality;
GHG emission



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Abstract: *One of the biggest threats to today's society is climate change – the result of an increase in atmospheric concentrations of greenhouse gases (GHG), produced by human activities such as the burning of fossil fuels for energy production, transport and industrial processes. One of the largest GHG emissions sources is agriculture, but also a whole food system. This paper aims to analyse people's awareness of the food system's impact on climate change and if they are familiar with mentioned mitigation opportunities. The research on people's awareness of the impact of the food system on climate change was conducted among three groups of respondents – chefs, teachers and lecturers and students. The research showed that although people are aware that climate change is a serious problem, they are unaware of how it occurs and that the food that is produced, stored, transported, prepared and finally consumed affects climate change.*

1. INTRODUCTION

One of the biggest threats to today's society is climate change (King, 2004), which is the result of an increase in atmospheric concentrations of greenhouse gases, primarily carbon dioxide, produced by human activities such as the burning of fossil fuels for energy production, transport and industrial processes, and have far-reaching impacts on the environment, human health and social and economic systems. One of the most significant impacts of climate change is the rise in global temperatures, which leads to the melting of glaciers and polar ice caps, causing sea levels to rise. Rising global temperatures are also causing more frequent and intense heat waves, droughts and forest fires (Seneviratne et al., 2021), which can have devastating effects on agriculture and food production (Perry & Swaminathan, 2010), as well as human health and well-being. Climate-induced natural disasters, such as droughts, floods, earthquakes, cyclones and hurricanes have been more frequent recently and they can lead to the erosion of the nutrient-rich topsoil, resulting in infertile soil and extinction of traditional food crops (Dembedza et al., 2022).

On the other hand, agriculture and food production also impact climate change since agriculture contributes up to about 30% of the anthropogenic GHG emissions that drive climate change (Smith & Gregory, 2012). Moreover, the whole food system affects the GHG emissions, including preproduction – mostly fertilizer manufacture, and postproduction activities such as processing, packaging, refrigeration, transport, retail, catering and food management (consumption), and waste disposal (Vermeulen et al., 2012). The climate impact of the food system is measured by greenhouse gas intensity expressed in kilograms of carbon dioxide equivalents and it shows that animal-based foods, red meat (especially beef, lamb and mutton) (Lochman, 2023) and dairy are associated with the highest GHG emissions. Moreover, ultra-processed food

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also impacts the environment and the research conducted by [da Cruz et al. \(2024\)](#) showed that a decrease in beef and ultra-processed food purchases would result in a 21.1% reduction in carbon footprint and a 20.0% reduction in water footprint.

On the other hand, plant-based foods, such as fruits and vegetables, whole grains, beans, peas, nuts and lentils, use less energy, land and water, and therefore, have lower GHG intensity than animal-based food ([Poore & Nemecek, 2018](#)). Also, oil and fats are relatively minor contributors ([Harrer et al., 2021](#)).

The effect of food on climate change has also been analyzed as a part of the tourism offer. The research conducted in Galicia, a region in north-western Spain where local dishes are an important part of the tourism offer, showed that the higher the portion of animal products in the recipes, the costs and carbon footprint are higher. On the other hand, plant-based recipes tend to reduce greenhouse gas emissions and increase cost competitiveness and energy efficiency indicators ([Cambeses Franco et al., 2022](#)). Also, the analysis of the local food in the Autonomous Region of Madeira showed that their regional dishes, such as fried corn, boiled corn, tomato soup, wheat soup, passion fruit pudding and others, contribute to food sustainability, protect the environment and improve the tourism offer of the region ([Sousa & Mota, 2020](#)). Additionally, the research conducted by [Lochman and Vágner \(2023\)](#) showed that a meatless image represents an opportunity for the future development of an urban European destination.

Finally, there are several mitigation opportunities related to food system-related GHG emissions. Some of them include substituting food products with high GHG intensities with those of lower GHG intensities, reducing food over-consumption and reducing food loss and waste ([Babiker et al., 2022](#)). Also, the use of local food from local retailers and urban gardening not only affects climate change but also increases social well-being and improves nutrition ([Siiger, 2023](#)). This paper aims to analyze people's awareness of the food system's impact on climate change and whether they are familiar with the mentioned mitigation opportunities.

2. METHODS

Research on people's awareness of the impact of the food system on climate change was conducted in two phases – desk research and questionnaire. Desk research included an in-depth review of the relevant scientific literature (books, articles) and available Internet sources. The desk research results were the basis for the development of the questionnaire, which was divided into two parts. The first part of the questionnaire consisted of four questions related to food sustainability and climate change, while the second part related to the impact of food on the environment and consisted of 15 questions.

In the first part of the questionnaire, the respondents have been asked which of the mentioned practices and foods are the most sustainable, and which of the mentioned foods needs more water for its production. The second part of the questionnaire was related to the impact of food on the environment and the respondents were given a list of activities and food, including sweet food, salty food, meals and drinks to choose the most climate-neutral options. The respondents were also given the possibility to answer “I do not know”, to exclude the possibility of guessing the correct answer.

The survey was conducted among three groups of respondents - chefs, high school teachers and adult education lecturers, and students. A total of 51 participants participated in the research, of which 21 were chefs, 10 were teachers and lecturers, and 20 were students.

3. RESULTS

In the part of the questionnaire related to food sustainability and climate change, the participants were asked which of the below they consider to be the most sustainable practice. The answers offered were long-distance air transport of food, locally produced organic meat, deep-freezing vegetables, and growing vegetables in greenhouses heated by fossil fuels. The correct answer is locally produced organic meat, and 85.7% of chefs, 60% of teachers and lecturers and 50% of students answered this question correctly.

In the next question, participants had to choose which of the following options they considered the most sustainable – growing food locally, growing food with less fossil fuels, food containing genetically modified organisms, and food grown without harmful impact on the environment. The correct answer to the above question was food grown without harmful effects on the environment. A total of 47.6% of chefs and restaurateurs answered correctly. Most of the teachers and lecturers, 60%, answered that the most sustainable option is food grown without harmful effects on the environment, while 50% of students also answered correctly.

Also, participants were asked which of the following foods – grains, beef, melons and leafy vegetables such as lettuce or spinach - require the most water to grow for a typical serving of food. The correct answer to that question is beef, and 57.14% of chefs answered this way. On the other hand, only 30% of teachers and 25% of students answered that beef requires the most water.

Finally, the last question in the first part was what foods should be in order to maximize the benefits of a vegetarian diet that is proven to be more environmentally sustainable. The answers offered were regionally/locally produced, seasonally consumed, organically grown and all of the above. The correct answer is all of the above. A total of 47.6% of chefs and restaurateurs answered correctly, as well as 40% of students, while teachers showed the best awareness of food sustainability since 90% of them answered correctly. The results of awareness of food sustainability and climate change are presented in Figure 1.

In the second part of the questionnaire, participants were asked which aspect of the food industry has the greatest impact on the environment and climate change. The answers offered were production, storage, packaging, transport, and I don't know. The correct answer to this question is production, which was given by 57.1% of chefs, 10% of teachers and 40% of students.

Also, participants were asked if they think it is true that the production of meat and dairy products causes higher CO₂ emissions per kilogram than the production of vegetables. The correct answer to that question is that this statement is true. A total of 85.7% of chefs and only 30% of teachers and 30% of students answered correctly.

Furthermore, participants had to answer whether they believe it is true that the production of 1 kg of beef causes more greenhouse gases than the production of 1 kg of wheat. The correct answer to that question is that it is true, and 66.7% of chefs and restaurateurs answered this way, as well as 30% of teachers and 20% of students.

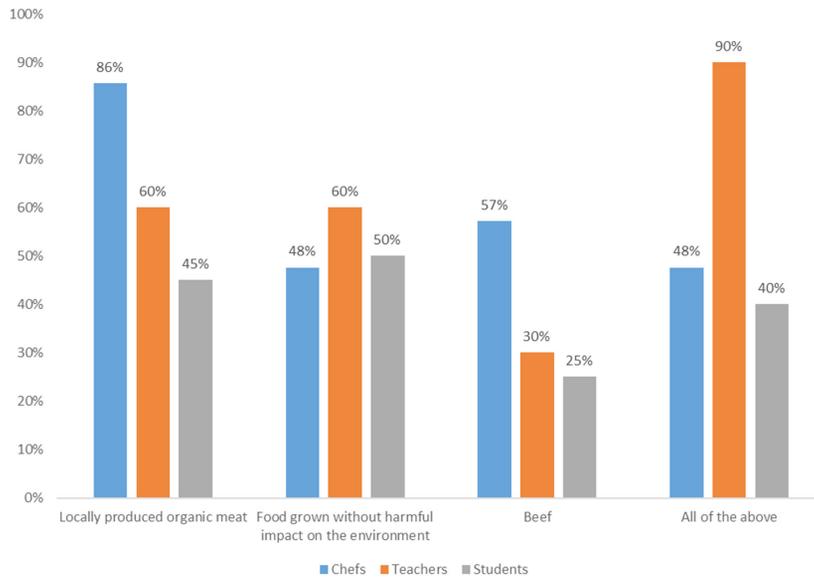


Figure 1. Awareness of food sustainability and climate change
Source: Own research

The next question was whether participants considered that the negative effects of food production and consumption on climate change and the environment could be reduced by switching to a vegetarian diet (without meat consumption). The correct answer to that question is that the statement is true. A total of 57.1% of chefs answered correctly, while only 40% of teachers and 15% of students are aware that switching to a vegetarian diet can reduce the negative effects of food on climate change. The awareness of the effect of the food industry on climate change is presented in Figure 2.

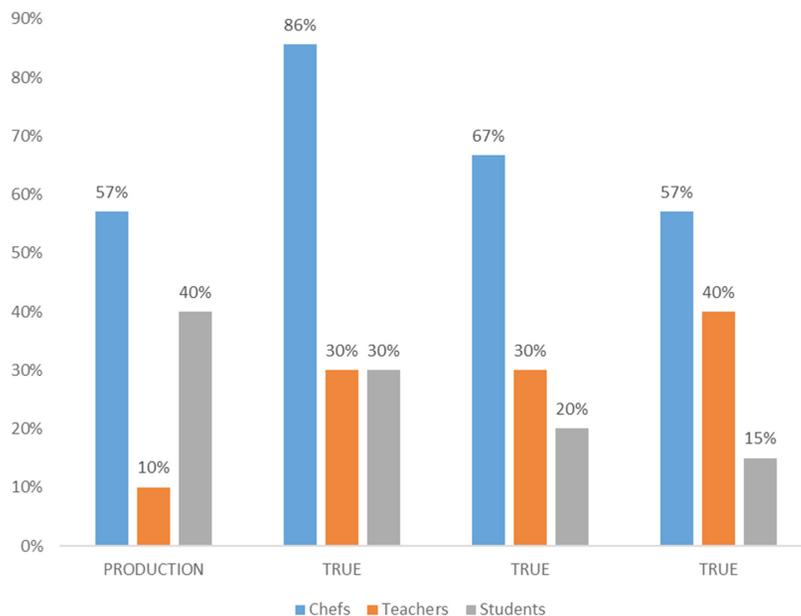


Figure 2. Awareness of the effect of the food industry on climate change
Source: Own research

In the following questions, participants were offered several types of food from which they had to choose which is associated with the least impact on climate change and the environment (per 100 kg). Between potato chips, bagels and salami sticks, the correct answer is bagels. The

correct answer to this question was given by only 23.8% of chefs and 15% of students, while none of the teachers and lecturers answered correctly.

Between milk, white and dark chocolate, dark chocolate has the least impact on climate change and the environment. Most of the chefs, 42.9% answered correctly, while the same share of them did not know the answer to this question. 50% of teachers and lecturers are aware that dark chocolate is a more environmentally friendly option, as well as 35% of students.

Between pasta with bolognese beef sauce and pasta with vegetables and tomato sauce, the more climatically and environmentally friendly dish is pasta with vegetables and tomato sauce. All of the chefs who participated in the research answered that the most climatically and environmentally friendly dish is pasta with vegetables and tomato sauce, while 70% of teachers and lecturers and 50% of students also answered correctly.

Between the organic beef burger, the organic salmon burger and the quinoa burger, the most climate and environmentally-friendly dish is the quinoa burger. A total of 66.7% of chefs are aware that quinoa burger is the most climate and environmentally-friendly dish, while only 30% of teachers and 20% of students answered correctly.

In the selection consisting of kebabs with meat and kebabs with falafel, the more climatically and environmentally friendly dish is the kebab with falafel, which was answered by 61.9% of chefs, 40% of teachers, and only 20% of students. The results of the awareness of climate and environmentally friendly ingredients are presented in Figure 3.

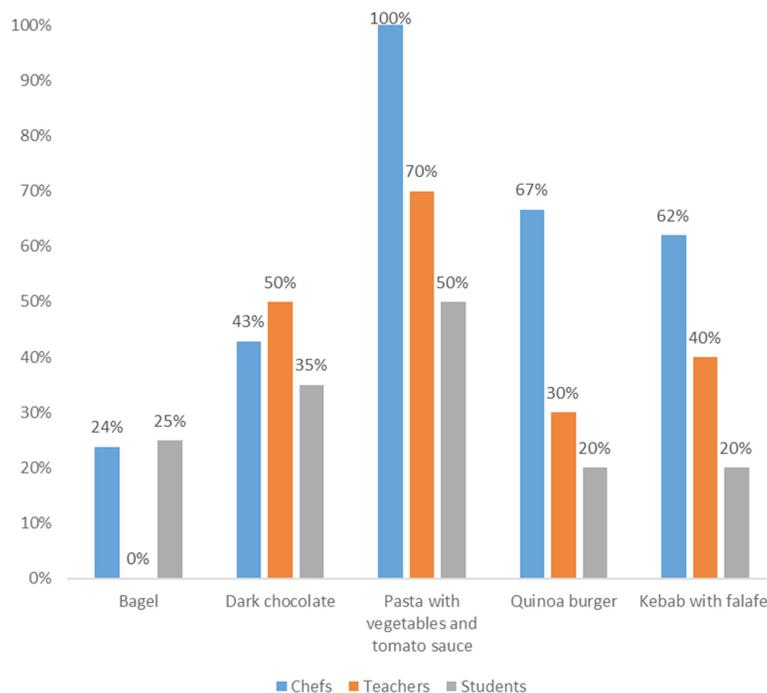


Figure 3. Awareness of climate and environmentally friendly ingredients

Source: Own research

In the next set of questions, participants were offered several dishes and had to choose which of them was the most climatically and environmentally acceptable. Firstly, participants had to choose between beef ragu, mashed potatoes and beans, chicken ragout, mashed potatoes and

beans, and mushroom ragout, mashed potatoes and beans, of which the most climatically and environmentally acceptable dish is mushroom ragout, mashed potatoes and beans. The correct answer to this question was given by 76.2% of chefs, while only 40% of teachers and the same share of students are aware that mushroom ragu, mashed potatoes and beans are more environmentally friendly than beef or chicken ragout.

In the next question, participants were given a choice of 100 g of imported asparagus (transported by plane), 100 g of domestic chicken, 100 g of domestic beef, 100 g of imported tofu (transported by boat) and 100 g of domestic pork. Of the mentioned products, 100 g of imported tofu (shipped by ship) is the most acceptable in terms of climate and environment. Only 14.3% of chefs and 10% of students are aware that among others, 100g of tofu imported by ship is the most environmentally friendly option and none of the teachers and lecturers answered correctly.

Continuing with the subsequent question, participants had to choose an ingredient for the main dish if they wanted to prepare a dinner that was as climate and environmentally friendly as possible. The answers offered were tofu from overseas imports and meatloaf from local meat, and the correct answer was tofu from overseas imports. It was recognized by only 28.6% of chefs and 10% of students, while none of the teachers answered correctly.

In addition to the main ingredient, participants had to choose a side dish for the climatically and environmentally friendly dinner. The answers offered were asparagus imported by plane and beans imported by ship. The correct answer to this question is beans imported by ship and 47.6% of chefs answered that way, while only 10% of teachers and 15% of students gave the right answer. The awareness of climate and environmentally friendly dishes is presented in Figure 4.

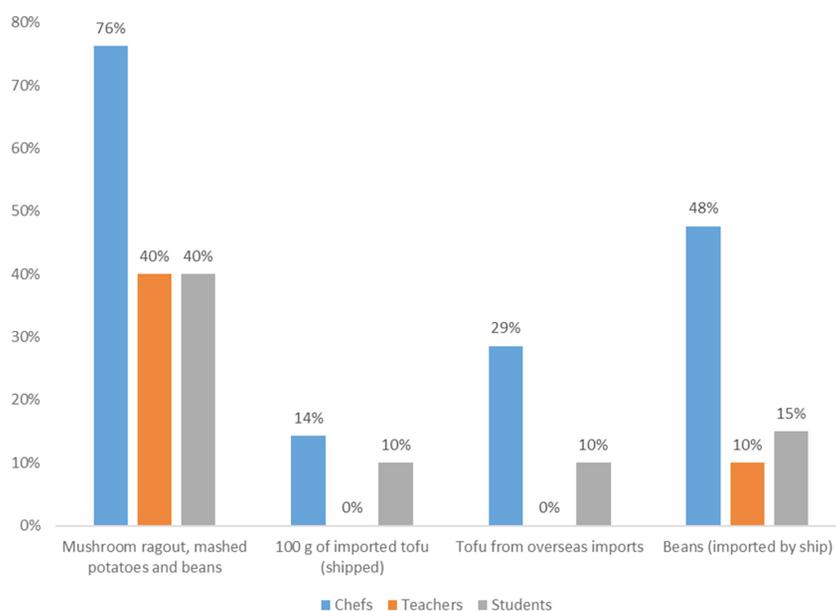


Figure 4. Awareness of climate and environmentally friendly dishes

Source: Own research

The last two questions were related to climatically and environmentally acceptable drinks. In the first question, participants had to choose between coffee and black tea, and the correct answer was black tea. Most of the chefs, 71.4% are aware that black tea is more environmentally friendly than coffee, as well as 50% of students, while only 30% of teachers answered that way.

In the last question, participants chose between mineral water and ordinary tap water as a more environmentally and climate-friendly drink. The correct answer to this question is plain tap water and it was answered by 71.4% of chefs, 60% of teachers and 50% of students. The result of the awareness of climate and environmentally friendly drinks is presented in Figure 5.

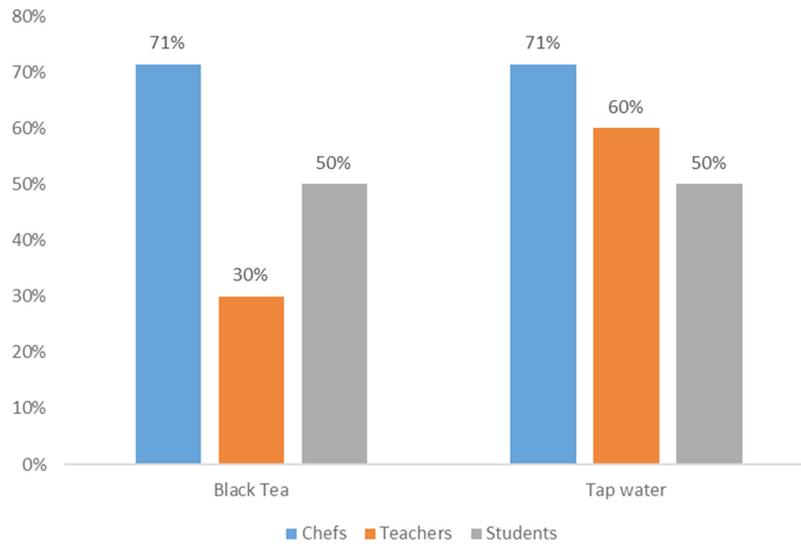


Figure 5. Awareness of climate and environmentally friendly drinks

Source: Own research

4. FUTURE RESEARCH DIRECTIONS

The importance of the effect of agriculture and the food system as a whole has risen significantly in the past years. A lot of papers have been published analyzing the effect of meat and dairy foods on climate change and a significant number of researchers have shown that plant-based food is more climate neutral. Also, a significant contribution has been made to analyze whether a plant-based diet can be a new tourism path, for ensuring climate neutrality together with tourism development.

An interdisciplinary approach to these topics is still missing and it should be emphasized in the future. Research on the impact of the individual's eating habits on their health and well-being is a global trend. However, research on the impact of these habits on production and trade chains from the aspect of climate changes, natural disasters such as droughts, stormy winds, or melting glaciers as the final consequences of climate changes and consequent geo-climate migrations is still lacking. The example of the necessary research connecting and providing a holistic insight into socio-economic development and climate changes are related to sustainable tourism development, including the catering industry and gastro tourism and their impact on the prevention and mitigation of the consequences of climate change.

The conducted research points to a widely perceived lack of knowledge of the wider population on climate changes in general, and especially related to the gastro sector. Therefore, such research should also be supported in the future. Bearing in mind the fact that education from an early age is one of the key ways of changing people's awareness of environmental challenges, it would be important to investigate the existence of educational programs related to this topic, as well as to develop new programs at all levels from primary and secondary school, vocational education to professional and scientific university studies.

In conclusion, an interdisciplinary approach to the topics of nutrition, education and climate challenges has just opened and is an important area of cooperation of different scientific fields in the future.

5. CONCLUSION

In the previous several years, the importance of the effect of agriculture and the whole food system has become an emerging topic. A lot of authors analyzed the effect of production, storage, transportation, preparation and finally waste disposal of the food and showed that meat and dairy-based foods produce more GHG emissions than plant-based foods. This paper aimed to analyze the awareness of people of the impact of the food they consume on climate change.

In the conducted research, 21 chefs, 10 teachers and lecturers, and 20 students participated in the research of knowledge and skills about the impact of food preparation on climate change and carbon dioxide (CO₂) emissions. The research employed a questionnaire divided into two parts. The initial section focused on food sustainability and climate change, requiring participants to identify the most sustainable methods in food production, distribution, packaging, and consumption. Results indicated that chefs and teachers possessed a higher understanding of food sustainability compared to students. The second part of the questionnaire delved into the environmental impact of food, assessing respondents' perceptions of the life cycle and negative effects of production, processing, distribution, and storage. Chefs and restaurateurs demonstrated superior knowledge in this area, while students and professors lagged, collectively providing only 29% correct responses.

The research suggests although people are aware that climate change is a serious problem, they are not aware of how it occurs and that the food that is produced, stored, transported, prepared and finally consumed affects climate change. The results of the research showed that chefs are aware of which types of food are the most environmentally acceptable. On the other hand, students, teachers and lecturers are not so aware of the sustainability of food and the impact of food on the environment.

To address these gaps, recommendations include organizing workshops on circular economy, climate change, and CO₂ emissions for the gastronomic sector, urging employers to facilitate employee participation. Additionally, timely dissemination of relevant educational programs to teachers, lecturers and students is essential. Encouraging sustainable practices in restaurants, conducting workshops on the impact of food on the environment, and integrating climate change into the school curriculum are proposed measures for improving awareness and fostering responsible practices.

Acknowledgment

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Business Management Strategies for Water Supply Systems in the Republic of Croatia: Mitigating Water Loss as a Performance Indicator

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Abstract: *The metric of non-revenue water provides insights into the extent of water lost in the network, representing the variance between water produced and water sold.*

This delves into an analysis of 35 water supply companies in the Republic of Croatia, collectively responsible for pumping approximately 95% of the total water supply. The sample encompasses all large and medium-sized companies out of a total of 147 (categorized as large, medium, small, and micro) according to FINA categorization, aligned with the Accounting Act (Official Gazette 78/2015).

Data for the analysis was sourced from secondary data sources, covering the period from 2011 to 2018. This comprehensive exploration seeks to unveil the intricate dynamics of business management strategies employed by water supply companies in Croatia and their direct impact on water loss reduction, thereby contributing to the sustainability of water supply systems.

1. INTRODUCTION

Water utilities are constantly caught in a difficult position and subject to conflicting priorities. The utility must provide services to all customers at affordable prices while controlling quality and maintaining financial incentives for its staff (Danilenko et al., 2014, p.22). Water losses are one of the key indicators of success in the management and sustainability of water supply systems, so lower losses will result in a better overall result of the company's operations (Taylor, 2010, p.2). By increasing certain categories of investment in material factors such as better infrastructure, better quality materials, and similar investment maintenance segments, water losses in the water supply network are reduced, positively affecting the state of the water supply network and the sustainability of water supply systems.

Non-revenue water shows how much water is lost in the network and the difference between water produced and water sold.

In this paper, an analysis was made on a sample of 35 water supply companies in the Republic of Croatia, which pump about 95% of the total pumped water. The sample represents all large and medium-sized companies out of a total of 147 (large, medium, small and micro) according to the FINA categorization, which is based on the Accounting Act (Official Gazette 78/2015). The data was collected from secondary data sources and was collected for the period from 2011 to 2018.

Hrvatske vode in its multi-year program for the construction of communal water structures 2014-2023. has an investment plan as an important part of reducing losses and improving the water supply infrastructure (Hrvatske vode, 2014, p. 57).

¹ Zagreb, Croatia

Table 1. Non-revenue water shown as a loss in euros for the average price of water for 35 companies in relation to revenues from sold water

YEAR	LOSS IN EUROS	REVENUES FROM SOLD WATER	SHARE
2011	394.800.260,2694	404.823.137,8326	97.52%
2012	1.150.426.912,8675	957.238.497,8433	120.18%
2013	1.021.442.104,5856	1.056.179.212,5556	96.71%
2014	1.104.925.386,8206	1.090.135.960,8468	101.36%
2015	1.159.775.655,4516	1.152.673.938,9475	100.62%
2016	1.080.108.026,4118	1.320.564.461,7427	81.79%
2017	1.125.673.244,0109	1.370.563.235,6493	82.13%
2018	1.159.396.149,1804	1.365.941.785,9181	84.88%

Source: Own research

Table 1 above shows non-revenue water as cost/loss in euros against revenues in euros for 35 companies.

Column 1 shows the losses in euros over 8 years, so we see a constant increase in the amount in euros from 2011 to 2018 and a sharp increase in the amount in 2012 due to a larger amount of water sold, and increased income in that year.

Column 2 shows total revenues in euros over 8 years, so we observe a constant increase in revenues from sold water due to an increase in the amount of delivered water.

Column 3 shows the shares of non-revenue water for all 8 years in the total revenue over 8 years, so we see an increase in the share of non-revenue water in 2012, followed by a decrease in 2013. The increase is visible again in 2014, and a decrease until 2018, in which a slight increase is visible.

2. HYPOTHESIS, DESCRIPTION AND DESCRIPTIVE STATISTICS OF VARIABLES

Hypothesis (H) states that by increasing certain categories of investment and material costs in the investment maintenance segment, water losses in the water supply network are reduced.

For testing, the author uses the variables listed in the following table 2. At the same time, non-revenue water represents a dependent variable, the other variables are predictive.

Table 2. The variables we use to test the hypothesis

VARIABLE NAME	THE LABEL OF THE VARIABLE
Nonrevenue water (m ³ /day/km)	NONREVENUE WATER
Material costs (euros)	COSTS
The length of the water supply network (km)	LENGTH
The number of connections	CONNECTIONS
Water coverage (%)	WATER COVERAGE

Source: Own research

Table 3 calculates the median values of the variables material costs, length of the water supply network, number of connections, coverage of the water supply network and nonrevenue water for each of the 35 entities in the period from 2011 to 2018 (Botica, 2022, p. 52).

Table 3. Median values of the variables material costs, length of the water supply network, number of connections, coverage of the water supply network and non-revenue water

ENTITY	COSTS	LENGTH	CONNECTIONS	WATER COVERAGE	NONREVENUE WATER
BELI MANASTIR	3125104.89	303.5	6811	100	5.505
BIOGRAD	4819287.5	149	12772	97	20.98
BJELOVAR	6372637	243	8362	98	10.55
CAKOVEC	9058285	1064	37902.5	100	5.255
DUBROVNIK	17890977.5	324	23605	99	33.3
DJAKOVO	2330787	450	14140.5	99	3.97
BUZET	34740536.5	2347.5	66474.5	100	9.345
KARLOVAC	12945748.5	540	15304.5	99	19.085
KOPRIVNICA	9083500	563.88	14948	97	1.485
KRIZEVCI	5851021.5	288.155	5108	77	4.39
KRK	18447572.13	518.6	23044	100	3.51
KUTINA	4607845.5	461.5	10586	81	3.385
LABIN	5781655		11698.5	99	4.25
MAKARSKA	6569514.5	260	17698.5	100	37.49
NASICE	4378849	263	6510.5	95	7.53
NOVA GRADISKA	2926964.535	327	5969.5	85	2.32
NOVI VINODOLSKI	3807529.2	427.5	18166.5	98	8.795
OMIS	5047237.5	480.5	11120.5	97	7.46
OSIJEK	20464882.5	542.2	27029	100	28.755
PETRINJA	2434695.5	254.9	7384.5	83	18.505
POZEGA	5629461	884	15602.5	95	4.755
PULA	22808893.5	898	44125.5	100	5.54
RIJEKA	36271028.5	969.5	41351	100	29.24
SINJ	6315993.325	488	14584.5	97	14.58
SISAK	16013001.5	496.45	13860	99	12.055
SLAVONSKI BROD	11761554.5	555.64	25159.5	93	15.28
SPLIT	32858464.5	887.3	59335.5	98	80.615
VARAZDIN	25482931.5	667	44371.5	100	15.83
VELIKA GORICA	12249196	617	18468.5	95	21.98
VINKOVCI	19262676.96	638	31942.5	100	16.835
VUKOVAR	6745116.76	294	19972.5	100	9.08
ZABOK	13510121	1492.5	28938	97	2.8
ZADAR	27368563.5	981.8	45754.5	98	60.52
ZAGREB	143871146.5	2267	95777	93	68.38
ZAPRESIC	8322518.26	479	8248.5	100	20.695

Source: Botica, 2022

The following table 4 calculates the minimum and maximum median values for each variable (Botica, 2022, p. 52).

Table 4. Minimum and maximum median values for each variable from Table 3

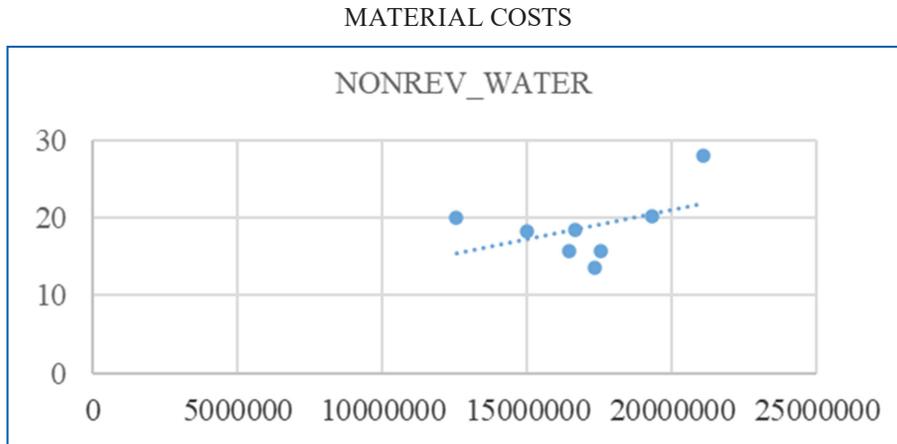
	MATERIAL COSTS	LENGTH	CONNECTIONS	WATER COVERAGE	NONREVENUE WATER
Min	2,330,787.00	149.00	5,108.00	77.00	1.49
Max	143,871,146.50	2,347.50	95,777.00	100.00	80.62

Source: Botica, 2022

The range of variables material costs, length of the water supply network, number of connections, coverage of the water supply network and non-revenue water illustrates the heterogeneity of the observed entities.

The following graphs show the dependence of the mean value of nonrevenue water per entity for each of the 8 years (total of 8 values) in relation to the mean values of the predictive variables per entity for each of the 8 years (8 values for each of the predictive variables).

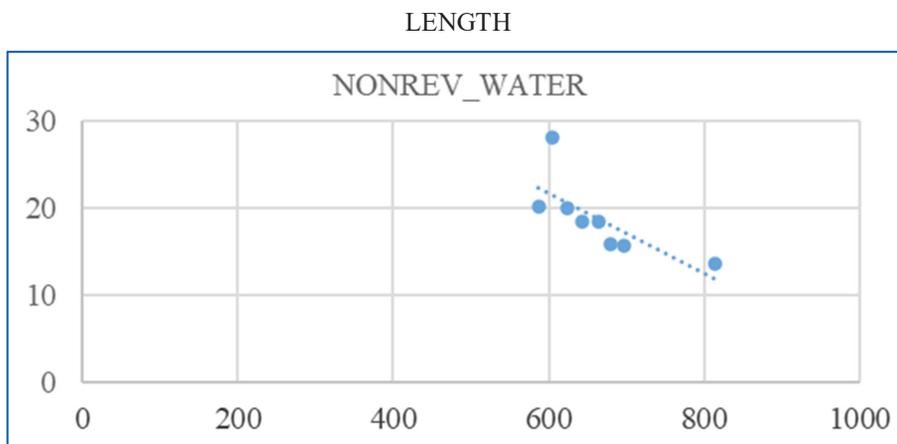
On graphs where the points are close to the line, along the line, or on the line, the variables are more predictive and useful for forecasting. If the points are more dispersed, the variables are more variable (inconstant, changing).



Graph 1. Dependence of the mean value of nonrevenue water per entity for each of 8 years (total of 8 values) in relation to the mean value of the predictive variable material costs per entity for each of 8 years (8 values for each of the predictive variables)

Source: Own research

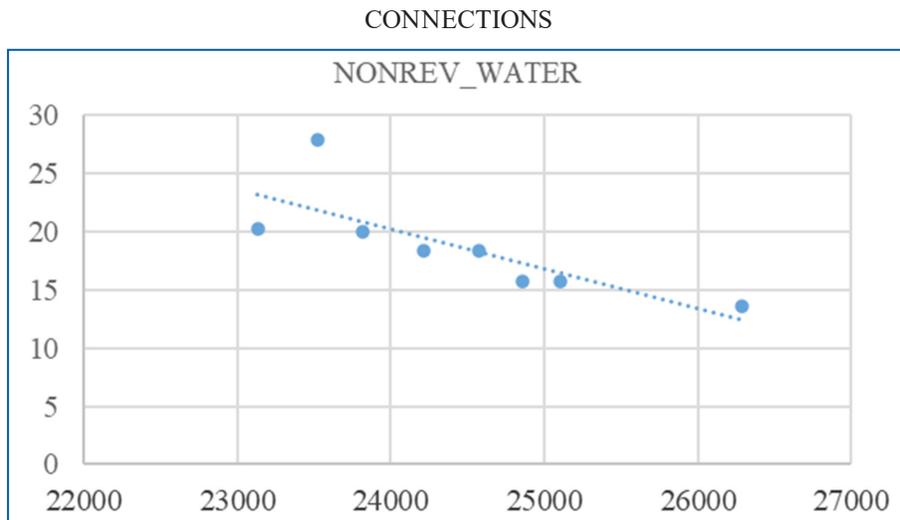
It is visible that the points are more dispersed, so the variables are more variable (inconstant, changing).



Graph 2. Dependence of the mean value of nonrevenue water per entity for each of 8 years (total of 8 values) in relation to the mean value of the predictive variable of the length of the water supply network per entity for each of the 8 years (8 values for each of the predictive variables)

Source: Own research

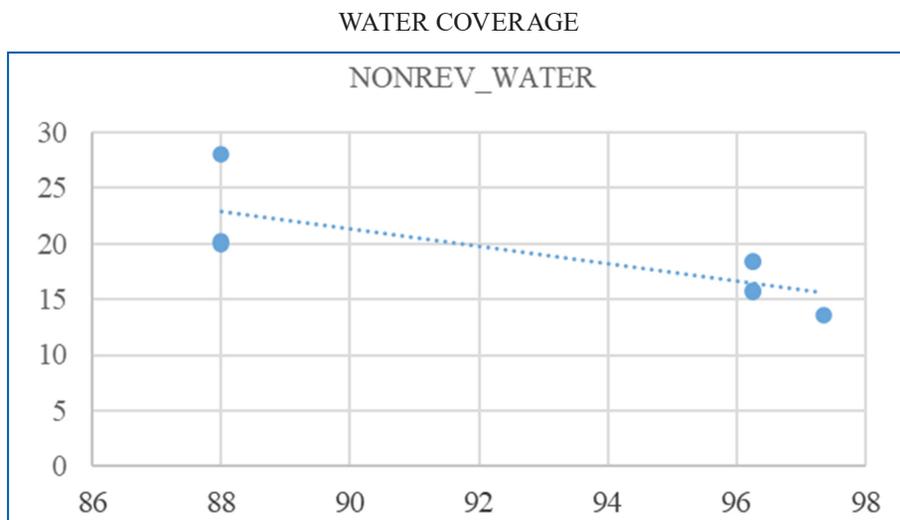
It is visible that the points are close to the line, along the line, or on the line, so the variables are more predictive and useful for forecasting.



Graph 3. Dependence of the mean value of nonrevenue water per entity for each of the 8 years (8 values in total) in relation to the mean value of the predictive variable number of connections per entity for each of the 8 years (8 values for each of the predictive variables)

Source: Own research

It is visible that the points are close to the line, along the line or on the line, so the variables are more predictive and useful for forecasting.



Graph 4. The dependence of the mean value of nonrevenue water by entities for each of 8 years (total of 8 values) in relation to the mean values of the predictive variable water supply service coverage by entities for each of the 8 years (8 values for each of the predictive variables)

Source: Own research

It can be seen that the points are more dispersed, so the variables are more variable (inconstant, changing).

3. PANEL ANALYSIS

The linear panel models are used to conduct panel analysis (Torres-Reyna, 2007). In the process of selecting models and significant variables, statistical tests are used, as well as expert understanding of the problem. A fixed effects model and a random effects model are applied for the dependent variable nonrevenue water and four predictive variables: material costs, length of the water supply network, number of connections and coverage of the water supply network. The programming language R and related packages are used.

When selecting variables for the final model, the backward method is applied to the fixed effects model. At the same time, in each step, and in each iteration, the fixed effects model is applied and the variable that is not statistically significant at the 10% significance level (p-value > 0.1) and which has the highest p-value is removed. The process stops when all variables in the model are significant at the 10% significance level.

Table 5. Coefficients (Botica, 2022, p. 58):

	Estimate	Std. Error	t-value	Pr(> t)
MATERIAL COSTS	9.4010e-08	6.2438e-08	1.5056	0.133468
LENGTH	-1.5864e-02	7.6290e-03	-2.0794	0.038637
CONNECTIONS	-2.0877e-03	6.5916e-04	-3.1673	0.001737
WATER COVERAGE	1.9841e-02	1.0234e-01	0.1939	0.846443
Total Sum of Squares:	36659			
Residual Sum of Squares:	31256			
R-Squared:	0.14737			
Adjusted R-Squared:	0.012933			
F-statistic: 10.4139 on 4 and 241 DF, p-value: 8.5053e-08				

Source: Own research

In the first step, the variable water coverage, which has the highest p-value of 0.84, and the variable material costs which has the p-value 0,13 are removed. Continuing the process, the final model is reached, which includes the variables length of the water supply network and number of connections.

By applying the fixed effects model and the random effects model for the selected variable, the following result is obtained (Botica, 2022, p. 59):

Table 6. Fixed effects model (Botica, 2022, p. 59)

	Estimate	Std. Error	t-value	Pr(> t)
LENGTH	-0.01402851	0.00753546	-1.8617	0.0638574
CONNECTIONS	-0.00216612	0.00064484	-3.3592	0.0009076
Total Sum of Squares:	36659			
Residual Sum of Squares:	31551			
R-Squared:	0.13933			
Adjusted R-Squared:	0.011825			
F-statistic: 19.6693 on 2 and 243 DF, p-value: 1.2094e-08				

Source: Own research

Table 7. Random effects model (Botica, 2022, p. 59)

	Estimate	Std. Error	z-value	Pr(> z)
(Intercept)	11.3029012	3.9078938	2.8923	0.003824
LENGTH	-0.0325109	0.0057244	-5.6794	1.352e-08
CONNECTIONS	0.0011882	0.0001835	6.4749	9.488e-11
<hr/>				
Total Sum of Squares:	45805			
Residual Sum of Squares:	39580			
R-Squared:	0.13589			
Adjusted R-Squared:	0.12965			
Chisquare: 43.5611 on 2 DF, p-value: 3.474e-10				
<hr/>				
Hausman Test				
chisquare = 29.985, df = 2, p-value = 3.081e-07				

Source: Own research

According to the F test, the fixed effects model is shown to be significant at the 1% significance level ($p\text{-value} = 1.2094e-08$). According to the chi-square test, the random effects model is significant at the 1% significance level ($p\text{-value} = 3.474e-10$). According to the Hausman test based on the chi-square test statistic, the fixed effects model is preferred, as it is statistically more significant than the random effects model at the 1% significance level ($p\text{-value} = 3.081e-07 < 0.01$). According to R-squared, the fixed effects model explains 13.93% of the dependent variable. The relatively low R-squared in regression analysis limits the possibilities of using the model for prediction purposes.

Although the R-Squared is relatively low, the low p-values of the variables' number of connections and length of the water supply network imply the existence of a statistically significant influence of those variables for the dependent variable nonrevenue water.

4. CONCLUSION

High levels of nonrevenue water lead to low levels of efficiency (Asian Development Bank, 2010, p. 9). Nonrevenue water management allows utilities to expand and improve services, improve financial results, make cities more attractive, increase resistance to climate change and reduce energy consumption (Kingdom, 2016).

Statistically significant variables in the hypothesis H are the number of connections and the length of the water supply network. This is also visible in graph 2 and graph 3, where it can be seen that the points are close to the direction, along the direction, or on the direction, so the variables are more predictive and useful for forecasting.

According to the above results in panel analysis, it is obvious that by investing in extending the length of the water supply network and the number of connections, water losses also increase.

However the coverage of the water supply service is not statistically significant as the extension of the network and the increase in the number of connections. The same can be explained by the fact that the coverage of the water supply network does not mean that people are connected to the water supply system.

The increase in the number of connections and the extension of the network significantly affects the increase in water losses, since it is necessary to deliver more water to a larger number of users through the old and new network. In order to avoid an increase in losses and increase sustainability, it is necessary to invest in the reconstruction and maintenance of the existing and old infrastructure, as well as in the quality of the new one, in addition to investing in the expansion of water supply coverage.

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Improving Water Resource Management: Evapotranspiration-Based or Tensiometer-Based Irrigation Scheduling

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Abstract: *Climate changes and competition between agriculture and other sectors for soil and water resources usage that water resource management obtains increasing significance. As a part of agricultural water resource management the choice of irrigation scheduling method influences the yield, water and fertilizer use efficiency, energy consumption, cost-effectiveness, etc. This paper focuses on the comparative analysis between evapotranspiration-based and tensiometer-based irrigation scheduling components and cost-effectiveness. Using data from a greenhouse experiment carried out with first-year strawberry plants (*Fragaria x ananassa* "Snow White") in 2023 at the experimental field of Chelopechene at the Institute of Soil Science, Agrotechnologies and Plant Protection "Nikola Pushkarov", Sofia, Bulgaria. The results show that evapotranspiration-based irrigation scheduling is more cost-effective than tensiometer-based one.*

1. INTRODUCTION

The world population has increased rapidly in the last 60 years (approximately 38% according to FAOSTAT, 2023a) and it is expected to increase by nearly 2 billion persons in the next 30 years and agriculture should respond adequately to increasing food needs. The main limiting factors of agricultural production are land and water. According to FAOSTAT (2023b), approximately 34-37% of land area was used from agriculture from them only 3-7% (Figure 1) is irrigated but the renewable internal freshwater resources per capita decrease (Figure 2). At the same instant climate change challenges and competition between agriculture and other sectors for soil and water resources usage that water resource management obtains increasing significance.

2. IRRIGATION SCHEDULING

“Water Resource Management encompasses the whole set of technical, institutional, managerial, legal, operational actions acquired to plan, develop, operate and manage water resources. Water Resources Management can be considered as a process including all activities of planning, design, construction and operation of water resources systems. Water Resources Management integrates by definition all aspects and functions related to water” (Savenij, 1996, p.1). As a part of agricultural water resource management the choice of irrigation scheduling (right water amount applied at the right time for the best quality and quantity crop yield) method

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influences the yield, water and fertilizer use efficiency, energy consumption, cost-effectiveness, etc. Irrigation scheduling is determining when and how much to irrigate. According to [Dong \(2023\)](#), the irrigation scheduling methods are: feel and appearance; gravimetric; weather-based; sensor-based; plant-based; IoT sensor technology and smartphone APP. This paper focuses on weather-based and sensor-based irrigation scheduling.

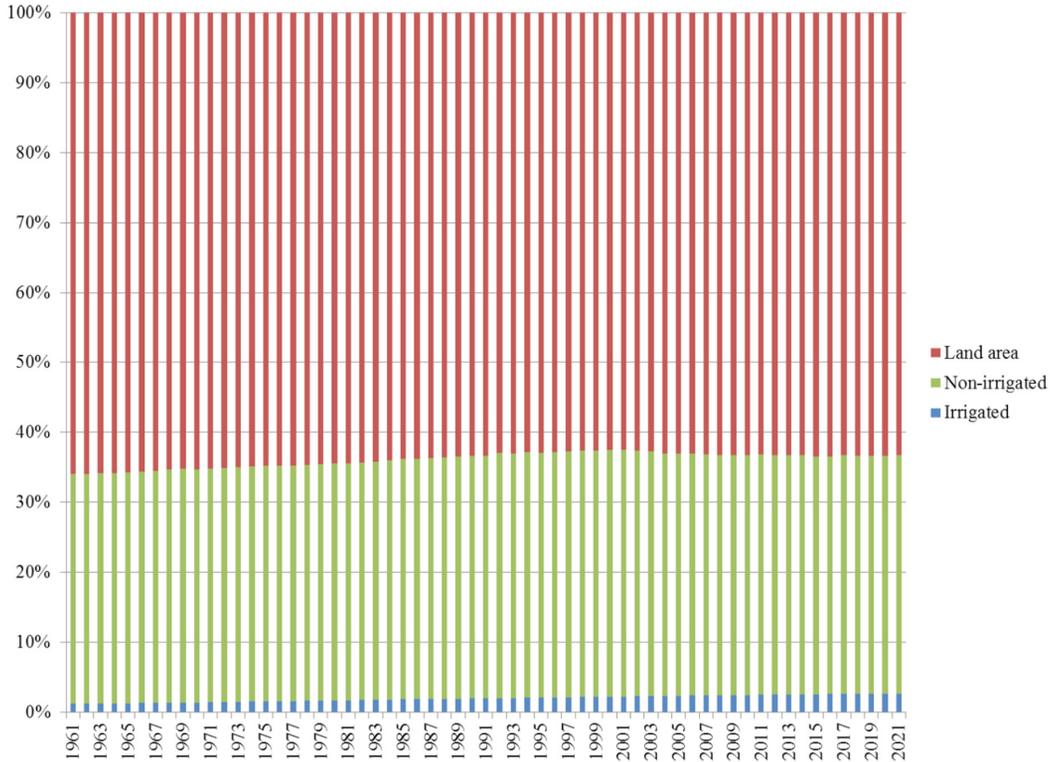


Figure 1. Land use
 Source: FAOSTAT, 2023b

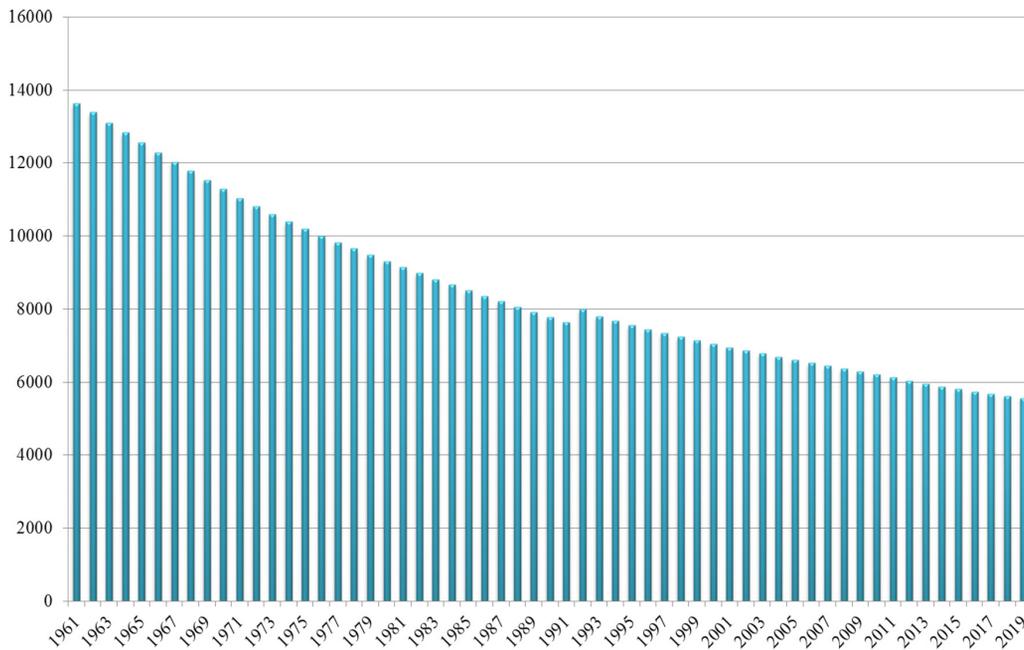


Figure 2. Renewable internal freshwater resources in cubic meters per capita
 Source: FAOSTAT, 2023c

Weather - or evapotranspiration-based irrigation scheduling method includes irrigation rate determining based on crop evapotranspiration.

$$ET_c = k_c ET_o \quad (1)$$

Where:

- ET_c – crop evapotranspiration (mm/day);
- k_c – crop coefficient;
- ET_o – reference evapotranspiration (mm/day).

Reference evapotranspiration ET_o depends on air temperature, relative humidity, solar radiation, sunshine duration and wind speed. One of the most used equations for ET_o determination is the Penman-Monteith Equation (Allen et al., 2006) from meteorological station data. The main advantage of evapotranspiration-based irrigation scheduling method is the ability to use one weather station for the entire field for different crops. The main disadvantage of evapotranspiration-based irrigation scheduling method is estimating crop water requirements for a past period to predict future irrigation rates (Gendron et al., 2018).

Sensor-based irrigation scheduling method includes irrigation rate determination based on sensors that measure water content in the soil. The sensors are installed in the root zone and are soil matric potential sensors or volumetric water content sensors. The main advantage of tensiometer-based irrigation scheduling is real-time data for soil water content. The main disadvantages of tensiometer-based irrigation scheduling are the necessity of individual sensors for the different crop types, different installation depths according to crop root depth, sensors should be installed in a representative field zone with careful attention to soil texture (Sui & Vories, 2020) and field calibration.

3. MATERIAL AND METHODS

A first year two-factor experiment was conducted on drip-irrigated strawberry plants in an unheated polyethylene tunnel greenhouse in 2023 in the Chelopechene experimental field (latitude 42°44'22.8"N, longitude 23°28'3.7"E and altitude 550 m above sea level) of the Institute of Soil Science, Agrotechnologies and Plant Protection "Nikola Pushkarov" in Sofia, Bulgaria. Mulching was applied to further reduce water evaporation and inhibit weeds. The object of the study was the white strawberry variety (*Fragaria x Anannassa* „Snow White”). The experimental treatments were arranged according to the method of long plots. The irrigation factor was applied in two rates: I1 – deficit irrigation - 75% (ET_c); I2 - deficit irrigation - 50% (ET_c). The fertilization factor was applied in two rates: F1: optimal fertilization $N_{8.09}P_{12.76}K_{15.62}$; F2 – suboptimal fertilization - 75% (F1) - $N_{6.07}P_{9.57}K_{11.94}$. Optimal fertilization was developed according to Haifa nutrition recommendations (Haifa Group, 2021). Five treatments were tested: control treatment I0F0: 100% (ET_c) - full irrigation at irrigation rate estimated by evapotranspiration and without fertigation; I1F1; I1F2; I2F1; I2F2. The microclimate of the greenhouse: air temperature, relative humidity, solar radiation sunshine duration and wind speed in the greenhouse was measured every 30 min using an automatic meteorological station and recorded in a data logger (HOBO USB Micro Data Logger, USA). FAO Penman-Monteith Equation (Allen et al., 2006) was used for determining reference evapotranspiration and irrigation scheduling. The soil matric potential was measured every hour by tensiometer EQ3 in control treatment for comparative analysis.

4. RESULTS AND DISCUSSION

Reference evapotranspiration for the period between two irrigation applications and irrigation rate for the 2023 growing season is shown in Figure 3. ET_o ranged from 2.95 mm to 24.24 mm and irrigation rate ranged from 1.92 mm to 18.05 mm. Irrigation frequency was between 7 days in the initial and end stages and between 3-4 days in the middle growing stage. The irrigation events were identified according to the FAO Penman-Monteith Equation (Allen et al., 2006). The first irrigation amount of 3.85 mm was scheduled on May 30 and the last one was on November 9 at 3.75 mm. 48 irrigation amounts of an average of 7.25 mm were scheduled for the 2023 growing season.

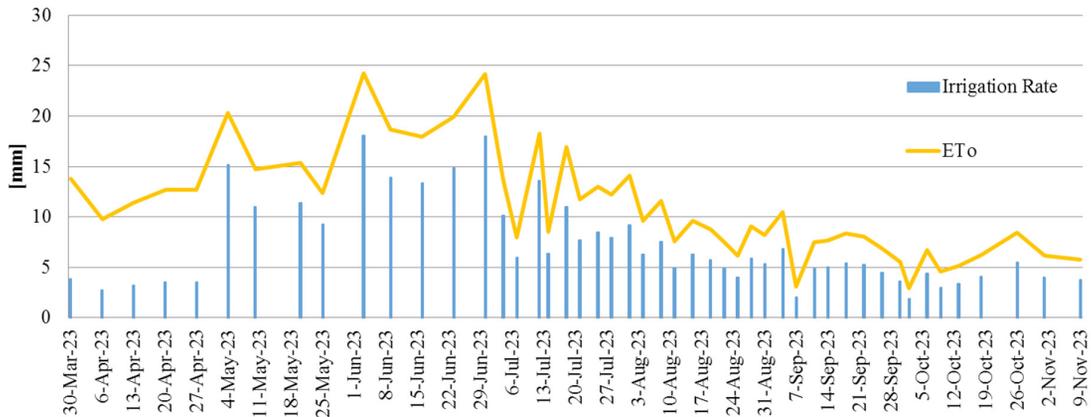


Figure 3. Reference evapotranspiration and applied irrigation rate

Source: Own research

The comparative analysis between evapotranspiration-based and tensiometer-based irrigation scheduling components shows that the biggest differences are observed for the period from July 19 to August 19 (Figure 4). For this period prediction irrigation rate did not match well with the measurement results of the soil moisture tension. Irrigation frequency was between 3-4 days and irrigation rate was estimated for the past period after every watering. The lowest soil moisture tension was observed on July 25 and the ET_c was estimated for 4 days. In the middle of this period was observed evapotranspiration increased i.e. crop water needs also increased. The irrigation application rate was applied two days later and crops had experienced some water stress. Next irrigation application was more adequate but it was followed by a period of several peaks of water stress. On August 1 irrigation rate was 9.21 mm but soil moisture tension inputs indicated for water deficit.



Figure 4. Daily crop evapotranspiration, applied irrigation rate and soil moisture tension

Source: Own research

For comparison weather station and tensiometer costs used during this experiment are shown in Figure 5. The results show that evapotranspiration-based irrigation scheduling is more cost-effective than tensiometer-based one.

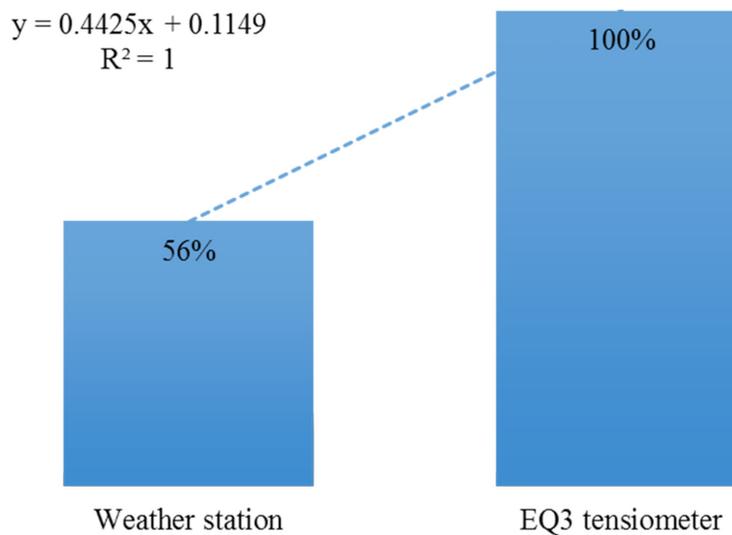


Figure 5. Initial costs

Source: Own research

5. CONCLUSION

A greenhouse experiment was conducted to compare evapotranspiration-based and tensiometer-based irrigation scheduling. The comparative analysis shows a couple of deviations in the irrigation recommendations between these two methods. With the purpose of improving water resource management and the effectiveness of irrigation, the peaks of water stress for plants could be avoided with real-time tensiometer-based irrigation scheduling. It should be considered higher initial costs for tensiometer-based irrigation scheduling equipment.

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Evaluation of Volatile Organic Pollutants in Water Samples from Durres's Port by Using the HS/SPME Technique

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HS/SPME;
GC/ECD/FID

Abstract: *In this paper, the concentrations of some volatile organic compounds (VOCs) in water samples from the port of Durres are presented. The Port of Durres is the largest port in Albania and one of the largest in the Balkans. Port water is affected by pollution that comes mainly from intensive shipping and other activities near the port area. The volatile organic pollutants that were analyzed were chlorobenzenes and BTEX (benzene, toluene, ethylbenzene, ortho-, meta-, and para-xylenes). Water samples were taken in July 2022 at 12 different stations near the port of Durres. The headspace solid phase micro-extraction (HS/SPME) method was used for the extraction and quantitative analysis of chlorobenzenes and BTEX, followed by gas chromatography (GC) techniques. This method presents advantages for the analysis of volatile pollutants because it eliminates the use of organic solvents and different sample treatment steps that often lead to erroneous results. The sensitivity and reproducibility of HS are favorable for volatile organic pollutants. The adsorption of organic pollutants was carried out on a polydimethylsiloxane (PS) fiber at a temperature of 50 oC for 30 minutes. The desorption process was carried out in the injector of the gas chromatograph at a high temperature (250 oC for 10 seconds). The qualitative and quantitative analysis of chlorobenzenes (mono-, di-, three-, tetra-, penta-, and hexachlorobenzene) was realized in the GC/ECD apparatus, while the analysis of BTEX was carried out in the GC/FID apparatus.*

Volatile organic pollutants were present in almost all of the samples analyzed. BTEXs were detected at higher levels. Their presence is related to the high intensity of transport within the area of the port of Durres. Toluene was the compound that was most frequently identified in the highest amount for all samples. Also, chlorobenzenes were detected in all the analyzed samples. 1,2,4-Trichlorobenzene was identified at a higher level in some stations inside the port of Durres. The presence of chlorobenzenes can be a consequence of urban spills, cleaning and sanitization processes (in the port area, on ships, etc.), or as degradation products of other compounds (pesticides, PCBs, etc.). The presence of BTEX and chlorobenzenes in the water samples from the port of Durres shows that the monitoring of this area should be continuous.



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1. INTRODUCTION

The favorable geographical position makes the port of Durres the largest port in Albania and is among the largest in the Adriatic Sea. It is a very important node for our country and the countries in the region (Kosovo*, North Macedonia, etc.). The port of Durres is located in the southwestern part of the city of Durres. Its infrastructure consists of 11 quays with depths

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* Under the UN Resolution 1244.

ranging from 7.5 to 11.5 meters. Most goods and passengers coming from the sea to our country are processed. The main goods processed in the port are general goods, grains, containers, ferries, and minerals. Currently, the Port of Durres has approximately 78% of maritime trade at the national level. The Port of Durres is also a key location for ferry networks and passenger transit, giving it a strategic position.

In many works by different international authors (Ukoha et al., 2015; Osuji & Achugasim, 2010; Ezquerro et al., 2004; Beltran et al., 2000), the high level of water pollution inside ports compared to other marine waters has been addressed. Transport of ships, spills of liquid or solid waste from them, accidents both on ships and in the land area of their handling, water and non-water transport vehicles near ports, and accumulation of materials (pesticides, oils, lubricants, minerals, diesel, and its by-products) near the ports have been observed to be the main sources of pollution in harbor waters. The most important marine water pollutants in ports are hydrocarbons, polychlorinated biphenyls (PCB), tetra-butylated tin, organic mercury (dimethyl mercury and other forms of it), dioxins, furans, pesticides, and heavy metals. Most of these compounds are included in the list of priority substances because of their stability over time and their dangerousness (toxicity) in the environment and humans. The industries that have a negative impact on the port environment are the metal processing, chemical, transport, tourism, and agriculture industries. We can say that the environmental pollution in the port areas is also a direct result of recent socio-economic developments in the region, such as the rapid growth of the population and tourism along the coast, the increase in automobile traffic, the reduction of the natural state of the coast, bad waste management and lack of suitable sewage systems, lack of disposal facilities, and the mass extraction of water from underground for industrial, agricultural, and residential purposes, all of which have greatly depleted water resources. Reduced green areas and uncontrolled deforestation have serious impacts on natural habitats and biodiversity. Anthropogenic sources of water pollution are divided into two groups: punctual and nonpunctual sources. Point sources include discharges of liquid urban waste (sewage) and livestock farms, industrial waste, and rinse water from solid waste disposal sites. Nonpoint sources include agricultural land drainage water discharge, atmospheric deposition, and sewage pipe leaks.

Headspace (HS) analysis is commonly used for the concentration (extraction) and analysis of volatile organic compounds. In the HS technique, the sample first establishes a balance between the gas phase (above the headspace) and the sample, which can be liquid or solid. This balance was established using moderate temperatures (30–70 °C) to allow volatile compounds to pass into the gas phase. Subsequently, a polymer fiber with high adsorption capabilities (solid-phase micro-extraction (SPME)) was used to homogeneously obtain this gaseous sample and pass it directly to the injector of the gas chromatograph (GC). The injector carried out the passage of the sample from the polymer fiber to the column of the apparatus through the desorption process at high temperatures (220–280 °C). Chromatographic columns enable the separation of all the volatile compounds found in the sample. The headspace technique can be used in static or dynamic modes. Currently, the HS technique is completely automated. The HS technique does not require the use of solvents and allows the extraction and analysis of sample compounds in a single step. HS/SPME analysis followed by GC analysis consisted of two steps: adsorption of the compound from the sample and transfer of the sample directly to the gas chromatograph by the desorption process. The amount of analyte transferred to the instrument is proportional to the volume of the gas phase and concentration of the analyte, assuming that the space above the sample is in equilibrium with the sample. During this procedure, compounds with higher boiling points (and a large molecular mass) are eliminated, thereby increasing the selectivity and

detection limit of the volatile analytes being studied. The head-space method is used to analyze volatile organic compounds in foods, beverages, pharmaceutical compounds, and other samples. Head-space methods cannot achieve complete sample extraction except in the case of highly volatile gases. Therefore, qualitative and quantitative analyses require careful calibrations. The head-space technique was developed in the 1980s to analyze compounds present in a wide variety of plants and their aromatic compounds, such as fatty acid derivatives (aldehydes, alcohols, and ketones), benzenoids, and isoprenoids (Ezquerro et al., 2004; Beltran et al., 2000; Duka et al., 2015; Nuro et al., 2018; Borshi et al., 2018).

2. MATERIAL AND METHODS

2.1. Taking and Transporting Samples

Water samples in the port of Durres were collected in July 2022. Water samples were collected at 12 stations: 10 inside the port and two near the port (outside the port). Water samples for organic pollutant analyses were collected in 1 L Teflon containers at each station. Water samples were collected according to the ISO 5667-3:2018 methodology. Water samples were transported to the laboratory and kept at +4 °C before analytical analysis. The sampling stations in the Port of Durres were as follows:

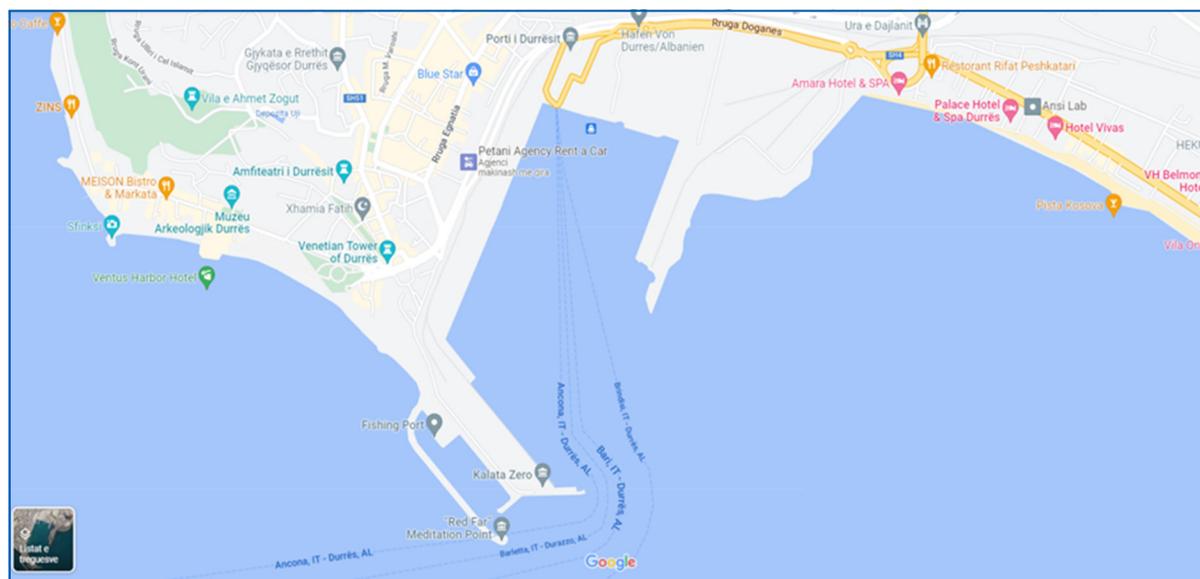


Figure 1. Map of sampling stations in the Port of Durres, July 2022

Source: Google Maps, n.d.

2.2. Analyses of BTEX in Seawater Samples

For the determination of BTEX, 5 ml of water samples were taken from the stations of the port of Durres and placed in SPME bottles with a volume of 10 ml. The bottles were equipped with Teflon stoppers suitable for analysis using the headspace technique. A manual SPME syringe equipped with a 100-um PDMS (polydimethyl siloxane) fiber was inserted through a Teflon stopper at the top of the sample. The bottle was then placed at 50 °C for 30 min. The syringe (PDMS fiber) was transferred to a gas chromatograph injector, where the desorption process was carried out at 250 °C for 10 s. A Varian GC 450 apparatus, equipped with a flame ionization detector (FID) and a PTV injector, was used for the qualitative and quantitative determination of BTEX.

The separation of BTEX was performed in a capillary column VF-1ms (30m length x 0.33 mm internal diameter x 0.25µm film), suitable for their separation. The temperature of the detector was set to 280 °C. Hydrogen (30 ml/min) and oxygen (300 ml/min) were the flame gases, while nitrogen was used as the carrier gas and makeup gas with a total flow of 25 ml/min. The initial oven temperature was held at 40 °C for 2 min, then increased to 120 °C at 5 °C/min, and then to 280 °C at 20 °C/min, where it was held for 2 min. For each sample, three parallel measurements were performed using the headspace method. Before the analysis of BTEX in the samples, a method evaluation was performed using the GC/FID apparatus to establish the optimal parameters for the quantification of BTEX (Osuji & Achugasim, 2010; Ezquerro et al., 2004; Nuro et al., 2018).

2.3. Analyses of Chlorobenzenes in Marine Water Samples

For the chlorobenzene analysis, 5 ml of water samples were taken from the stations of the port of Durres and placed in SPME bottles with a volume of 10 ml. The bottles were equipped with Teflon stoppers that were suitable for analysis using the head-space technique. A manual SPME syringe equipped with a 100-µm PDMS (polydimethyl siloxane) fiber was inserted through a Teflon stopper at the top of the sample. The bottle was then placed at 50 °C for 30 min. The desorption process for chlorobenzenes was realized in a gas chromatograph injector at 260 °C for 10 s. The qualitative and quantitative determination of chlorobenzenes was performed using a Varian GC 450 apparatus equipped with an electron capture detector (ECD). The separation of chlorinated benzene derivatives was performed using an RTX-5 capillary column (30 m length x 0.25 mm internal diameter x 0.25 µm film), which was suitable for their separation. The detector temperature was 280 °C. Nitrogen was used as the carrier gas and make-up gas at flow rates of 1 ml/min and 25 ml/min, respectively. The initial oven temperature was held at 50 °C for 1 min, increased to 100 °C at 50 °C/min, and then to 280 °C at 20 °C/min, where it was held for 2 min. For each sample, 3 parallel measurements were performed with the Head-Space method. The chlorobenzenes analyzed in this study were monochlorobenzene, dichlorobenzenes (1,2-, 1,3-, and 1,4-isomers), trichlorobenzenes (1,3,5-, 1,2,3-, and 1,2,4-isomers), tetrachlorobenzene (1,2,4,5-isomer), pentachlorobenzene, and hexachlorobenzene. Before the analysis of chlorobenzenes in seawater samples, a method evaluation was performed using the GC/ECD apparatus to set the optimal parameters (Beltran et al., 2000; Duka et al., 2015).

3. RESULTS AND DISCUSSIONS

In this study, water samples from the port of Durres, which is the largest port in Albania, were analyzed. Water samples were collected in July 2022. Volatile organic compounds were analyzed using the HS/SPME technique followed by gas chromatography. Qualitative and quantitative analyses of BTEX were performed using GC/FID, while the analysis of chlorobenzenes was performed using GC/ECD.

The processed data for BTEX in the water of the Port of Durres are listed in Table 1. BTEX was detected in all analyzed samples, except for sample D9, which was located in the southern part of the Port of Durres (Figure 2). The highest concentration was observed in sample D3, where the total concentration exceeded 10 mg/L. Following this, at the top level was the D12 sample (outside the port of Durres), at approximately 5 mg/L. The presence of BTEX in the water of the Port of Durres should be related to the transport of ships in the port area, the spilling of hydrocarbon waste in the port area and beyond, and the impact created by the transport of vehicles and car service in the area of Durres. Waste from other businesses operating in this area is also

not excluded. Figure 3 shows the profile of BTEX in the analyzed water samples. Toluene was detected in higher quantities than other volatile compounds. Its presence is a consequence of its identification in high quantity at station D3, where there may be some point source. This could also be the value of this compound's moment caused by water currents inside or outside the port of Durres or by the spillage of hydrocarbon waste from any vessel. Benzene levels in no case exceed the permitted rate for surface waters, according to [EU Directive 2008/105](#).

The statistical data for chlorobenzenes in the water of the Port of Durres are presented in Table 2. The presence of these compounds was noted in approximately 70% of the analyzed samples. At stations D3, D6, D10, and D11, the levels were more than 2 mg/L (Figure 4). Their presence in harbor water may be a consequence of liquid waste discharges from ships in the harbor area, hygiene and cleaning products, degradation of large organic molecules with chlorine (pesticides, PCBs, etc.), or sea currents and inside/ outside the port of Durres. Figure 5 shows the profile of chlorobenzenes in water samples from the Port of Durres. At a higher level, 1,2,4-trichlorobenzene (0.62 mg/L) has been detected, whose presence was identified at a higher level at several stations of the port of Durres. The presence of this compound may be related to its physicochemical properties (stability and solubility in water). Chlorobenzene, which was expected to be at higher levels, is the second pollutant (0.21 mg/L) detected in the water of the Port of Durres. The levels of volatile organic pollutants in the water of the Port of Durres were similar to those reported in previous works for the water of the Adriatic Sea, Albanian ([Duka et al., 2015](#); [Nuro et al., 2018](#), [Borshi et al., 2018](#)).

Table 1. BTEX data for Durres Port water samples, July 2022

BTEX	Mean	STDEV	Median	Min	Max
Benzene	0.311	0.352	0.203	N.D.	1.187
Toluene	1.041	2.865	0.075	N.D.	10.093
m-Xylene	0.463	0.407	0.415	N.D.	1.277
p-Xylene	0.297	0.271	0.224	N.D.	0.743
o-Xylene	0.415	0.586	0.130	N.D.	1.910
Ethylbenzene	0.184	0.244	0.056	N.D.	0.706

N.D. – Not Detected or lower than the Limit of detection (LOD)

Source: Our research

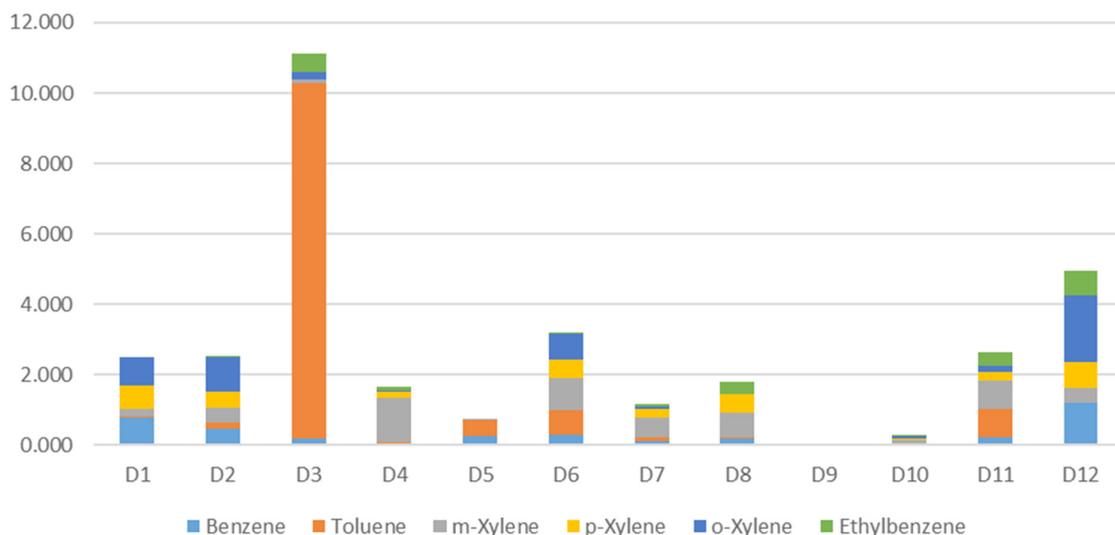


Figure 2. Total BTEX (mg/L) in water samples from the Port of Durres, July 2022

Source: Our calculations

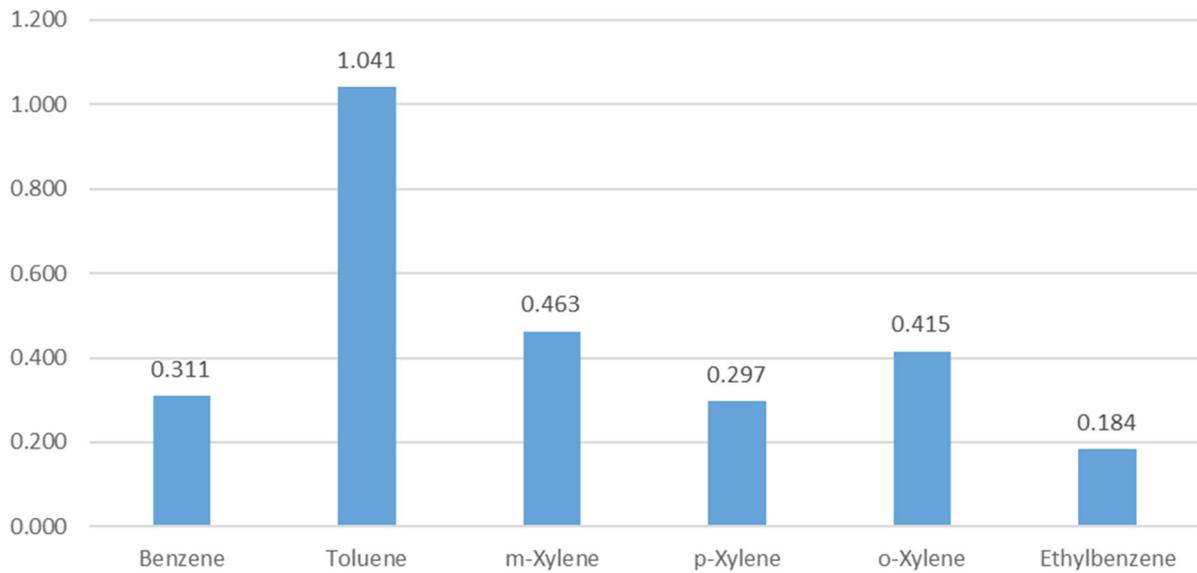


Figure 3. Profile of BTEX (mg/L) in water samples from the Port of Durres, July 2022
Source: Our calculations

Table 2. Data on chlorobenzenes in water samples from the Port of Durres, July 2022

Chlorobenzene	Mean	STDEV	Median	Min	Max
Chlorobenzene	0.211	0.309	0.111	N.D.	1.094
1,2-Dichlorobenzene	0.056	0.052	0.053	N.D.	0.169
1,3-Dichlorobenzene	0.007	0.010	0.004	N.D.	0.058
1,4-Dichlorobenzene	0.010	0.016	0.003	N.D.	0.059
1,3,5-Trichlorobenzene	0.053	0.082	0.024	N.D.	0.285
1,2,3-Trichlorobenzene	0.060	0.060	0.055	N.D.	0.211
1,2,4-Trichlorobenzene	0.623	0.916	0.164	N.D.	2.619
Tetrachlorobenzene	0.033	0.038	0.020	N.D.	0.124
Pentachlorobenzene	0.122	0.155	0.084	N.D.	0.541
Hexachlorobenzene	0.006	0.008	0.003	N.D.	0.028

N.D. – Not Detected or lower than the Limit of detection (LOD)

Source: Our research

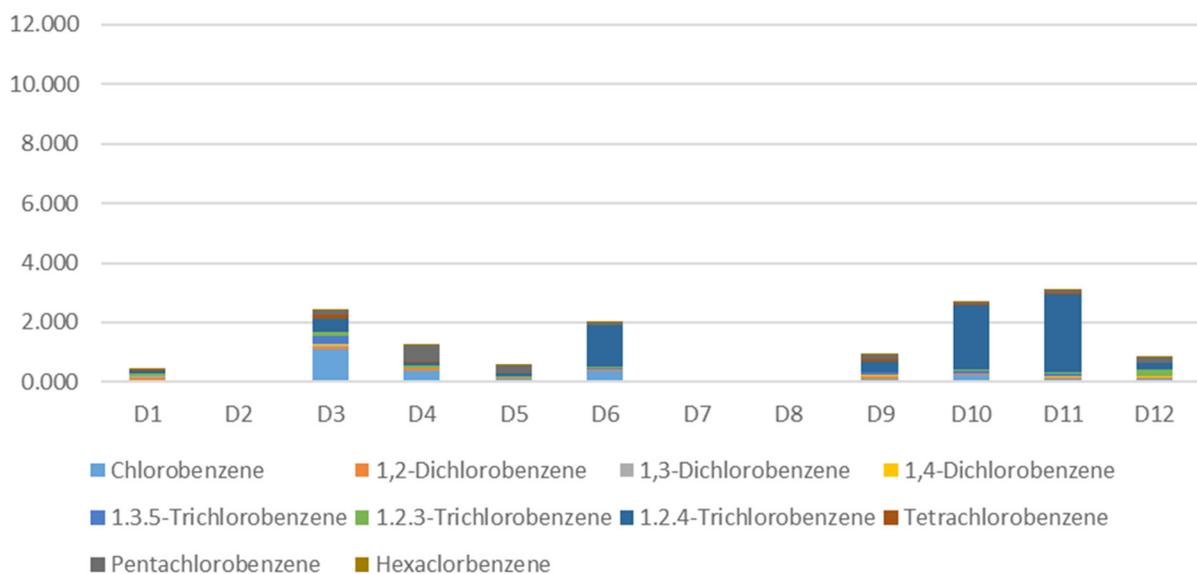


Figure 4. Total chlorobenzenes (mg/L) in water samples from the Port of Durres, July 2022
Source: Our calculations

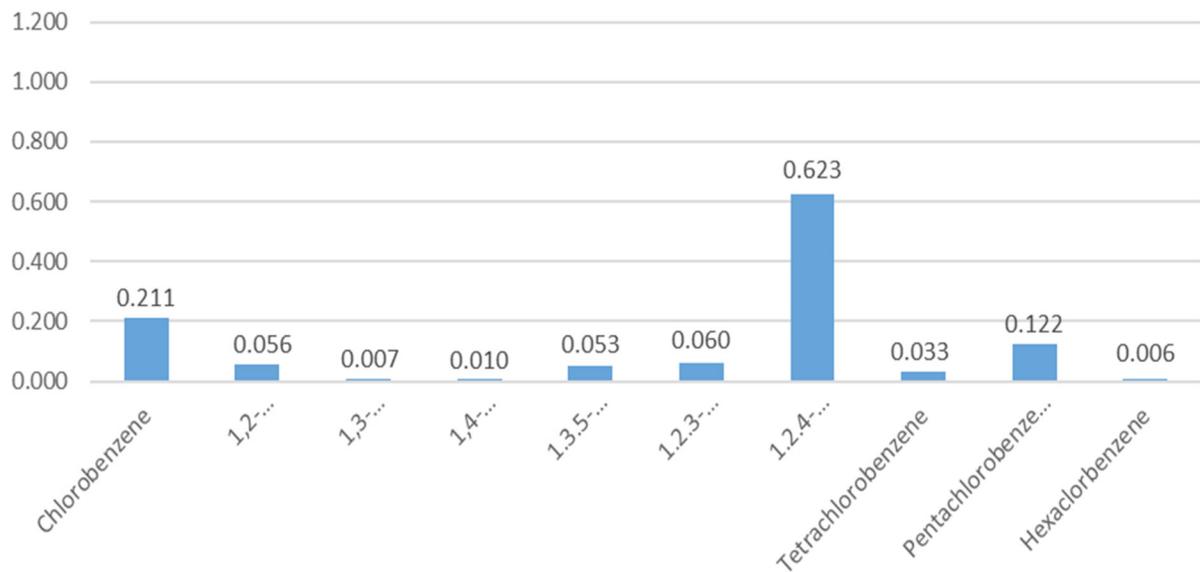


Figure 5. Profile of chlorobenzenes in Durres Port water samples, July 2022

Source: Our calculations

4. CONCLUSION

In this study, water samples from the port of Durres, which is the largest port in Albania, were analyzed. Water samples were collected in July 2022. Volatile organic compounds were analyzed using the HS/SPME technique, followed by the GC/FID/ECD technique. Volatile organic pollutants were present in almost all samples analyzed. Higher levels of BTEX were also observed. Their presence is related to the high intensity of transport within the Port of Durres. Spills of hydrocarbon waste in the port area, the impact of vehicle transport, and waste from other businesses operating in this area were not excluded. The momentum values and the influence of sea currents inside and outside the port of Durres were not excluded. Toluene was the most frequently identified compound in the highest quantity in all samples. Chlorobenzene was also detected in most samples. 1,2,4-trichlorobenzene was identified at a higher level at several stations inside the Port of Durres. The presence of chlorobenzenes can be a consequence of urban spills of cleaning/sanitization in the port area as degradation products of other compounds (pesticides, PCBs, etc.). The levels of volatile organic pollutants in the water of the port of Durres were similar to those reported in previous studies on the water of the Adriatic Sea. The presence of BTEX and chlorobenzenes in the water samples from the Port of Durres showed that monitoring of this area should be continuous. The analysis of BTEX, chlorobenzenes, and other pollutants in Durres Port water samples should be performed using the HS-GC/MS/MS technique.

Acknowledgment

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Conflict of Interest

Authors declare there is no conflict of interest.

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Integrated Urban Waste Management (Case study, Vlora Municipality)

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Abstract: *Urban waste management is the main and most problematic part of the cleaning service, which has become one of the sharpest problems to be addressed by local government bodies in Albania (Kodra & Milios, 2013). Population growth, tourism development, business development such as restaurants, markets, bars, economic growth and improvement of living standards have increased consumption rates and consequently the rate and volume of urban waste generation. Inadequate waste management has turned it into a source of environmental pollution and disease. In Albania, a small part of the waste is recycled, a little is buried and in most cases, it is deposited in certain landfills, which do not meet the appropriate engineering requirements for environmental protection and are subject to frequent fires. Burning urban waste or dumping it on the banks of rivers and streams has become the biggest 'gangrene' of environmental pollution and results in a high level of air pollution, but also poisons the soil and the groundwater that flows near these landfills (Alcani & Dorri, 2013). The situation is further aggravated by the fact that hazardous waste from the industrial sector is dumped in the same places as urban waste and treated in the same way.*

1. INTRODUCTION

Waste management (Collection, transportation, disposal and treatment of urban waste (Law 139/2015 “On Local Self-Government”, article 23, paragraph 10) is the direct responsibility of Local Government Units (LGUs). The high growth of the urban population in recent years has made waste management a real challenge for every city. The situation is no less alarming even in Administrative Units (former municipalities), as waste is deposited in unsafe areas, usually near the banks of rivers or roadsides. In most cases, they burn or worse, decompose, and return to the sites of infection. Since LGUs are responsible for urban waste management, they have the duty to determine the disposal sites in their district (Law 139/2015 “On Local Self-Government”, article 23, paragraph 10) and the fee for this service (Law 139/2015 “On Local Self-Government”, article 9, paragraph C/b).

1.1. Albanian Legislation Regulating Legal Relations between Financing and Urban Waste Management

This brief overview of the development of the Albanian legislation that regulates the legal relationship between financing and urban waste management creates an introductory overview of the issues that will be addressed in this paper, addressing at the same time the question “why” this topic was selected, but also giving relevant answers, which will be discussed in the following parts.

As discussed in the introductory section, urban waste management issues are the “biggest headache” for local government bodies, as they not only require the daily treatment and solution of their problems but also the demand for funds is constantly growing. Handling and solving urban

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waste issues is the daily work of municipalities; as the consumption of food is daily and consequently the generation of urban waste remains the same.

This topic will deal with the binomial “financial management” and “waste management”, which will be the questions and answers, while the points of approach or departure will form the topic. The development and growth of the general economy of the country, as well as the economy of each family, leads to an increase in the consumption and generation of urban waste, but also in many types of waste such as food waste, oils, fats, plastic, glass, paper, etc. Under these conditions, the municipalities have the duty not only to remove and clean them, but also to make financial policies for waste management, as they need more funds, more functional storage facilities, or more qualified staff. These actions should also be accompanied by the drafting of legal or bylaw provisions for the regulation of these created municipality-community relations.

From the conducted research, it appears that in the Albanian TAR legislation after the 1990s, the beginnings for solving urban waste management problems are found in VKM No. 319, dated 21.6.1994 “On Public Procurement of Public Cleaning and Waste Collection Services”. This decision, according to the provisions of the relevant articles, allows local government bodies (name changed by the Constitution of 1998 (Law no. 8417, dated 21.10.1998 “Constitution of the Republic of Albania”), since 1994, with the budget. Funds allocated for the procurement of cleaning and waste collection services through enterprise contracts with different companies and firms, specifying the types of this service:

- a) street cleaning;
- b) waste collection; and
- c) management of waste disposal sites.

Local government bodies divide the territory under their management into areas for street cleaning and waste collection, where contracts will be concluded based on procurement procedures with qualified contractors and for 3-5 years. From the analysis and control carried out in the public procurement bulletins, it results that large municipalities have operated with 3-5-year contracts for the provision of cleaning services, while former municipalities (which are currently administrative units) have mainly operated with 1-3-year contracts.

These statutory provisions drafted after the 1990s are straightforward, short and have no complex content to understand, but from our point of view, they are of particular importance as they are the first to pave the way for free enterprise, obliged the local government bodies of the time to secure financing and conclude contracts for the cleaning service.

The above types of cleaning services direct the focus of local government bodies in the design of projections and technical specifications of the respective services. Although in this study the focus will be on the collection and disposal of waste, it should be clarified that other services such as street cleaning and street washing are equally important.

Based on the above provisions in the period of entry into force of this Decision of the **Council of Ministers (1994)**, it could be easier for the local government bodies since the budget funds were provided by the state budget. In comparison, after 30 years, the funds must be provided by the payment of the cleaning fee from the residents located within the territory of the local government. The financial change is obvious since in 1994 the “big bag” of the state budget had to be paid, among other things, for the cleaning service and after 30 years we are facing the fact

that every resident of the community where he lives has to pay the cleaning fee to avail these services.

An aspect that draws our attention when we read or find materials on this topic is related to the needs of the community, where it turns out that in the early 1990s, one of the priority needs was the cleaning of the streets and the collection of waste, and now after 30 years, they have transformed into the needs of “waste management service” alongside other classic cleaning services such as street cleaning and washing. The change in demands is increasing significantly, as the municipality must not simply “contract” for the outsourcing of these processes of cleaning services, but must take measures, design policies and cooperate to carry out urban waste management.

In 1996, the issues of the cleaning service were regulated by [Law No. 8094, dated 21.3.1996 “On the disposal of public waste”](#), which, according to the provisions of article 1, aimed to protect the urban environment from waste pollution, their public deposit inside the territories of the municipality and commune, according to the border lines that are under the jurisdiction of each municipality and commune, as well as discipline the public services of the waste disposal of cities (delivery, collection, deletion and disposal) within the perimeter of the above territories. As the economy developed and people’s needs increased, the simple concepts of the post-1990s naturally evolved and these provisions no longer offered alternatives. After the 2000s, a series of laws and by-laws were adopted that regulated waste issues, categorized them, and compiled a catalog of waste according to the D Directives of the European Community ([Commission Decision 2014/955/EU and Council Directive 2008/98/EC](#)) and different strategies according to their respective fields. It is worth mentioning here several legal and by-laws such as [Law No. 10463, dated 22.9.2011, “On Integrated Waste Management”](#), [Law No. 10431, dated 9.6.2011 “On Environmental Protection”](#), [DCM No. 452, dated 11.7.2012 “On Waste Landfills”](#), [DCM No. 99, dated 18.2.2005 “On the Approval of the Albanian Waste Classification Catalog”](#) etc.

Regulations through the above laws, which have laid the foundations for regulating the provision of public cleaning services and urban waste management as well as the collection of revenues to cover costs, have already been consolidated and even fundamentally regulated with the entry into force of new laws such as [Law no. 9632, dated 30.10.2006 “On the local tax system”](#), [Law No. 139/2015, dated 17.12.2015, “On Local Self-Government”](#), or even individual laws that regulate waste and their classification ([DCM No. 99, dated 18.02. 2005 “For the Approval of the Albanian Waste Classification Catalog”](#)).

The current situation is that the legislation in force tends to help local government bodies by addressing the binomial issues of “financial management” and “waste management”. The principle of all this legislation as defined in Article 20 (1) of [Law No. 10463, dated 22.9.2011](#) is “the polluter pays”, which means that those who pollute the environment, including families, will be responsible for covering the costs of waste management, including taking measures to prevent and eliminate damage to caused by the waste they discharge into the environment.

1.2. Definition “Waste”

In the elaboration of this thesis, analyzing the problem of urban waste management in the Municipality of Vlora, the term “waste” will be constantly mentioned. To put it outside the framework of a municipality, it is worth noting that human activities generate waste, which in the 21st century has become a burden for the entire planet, the environment, ecosystems and man. In

order to come out and analyze the essence and problems of this thesis, it is important to analyze the linguistic meaning of the term “waste”, which constitutes the legal term.

In Today’s Albanian Dictionary (2002), the word “waste” means those who are left from something destroyed, broken, etc and they no longer go to work; something that has been left out and has no value, having gone out of use, has long been used. According to the [Online Cambridge Dictionary \(2020\)](#), “waste” means unwanted matter or material of any kind, especially that which remains after useful substances or parts have been removed.

“*Solid waste*” means a substance, object or part thereof, which is no longer used or which the possessor will dispose of substances, objects or their parts are considered waste, as long as the materials derived from them or the energy produced are not included in the production process.

“*Bio-waste*” means biodegradable waste from home gardens and parks, food and cooking waste from homes, restaurants, hotels and retail stores, and similar waste from food processing plants.

“*Hazardous waste*” means waste that exhibits one or more of the hazardous properties listed in annex 3 of this law.

“*Household waste*” means household waste from municipalities, communes and districts or their subdivisions, as well as other waste that by nature or composition is the same as household waste from municipalities, communes and districts or their subdivisions.

“*Inert waste*” means waste that does not undergo any significant physical, chemical or biological transformation. Inert waste does not dissolve, burn, physically interact or enter into chemical reactions, does not biodegrade and does not adversely affect other materials with which it comes into contact, in a way that can cause environmental pollution or harm human health. The total capacity for the liquid content of pollutants and the ecotoxicity of the leachate of the solid waste must be insignificant and in particular must not endanger the quality of surface and/or underground water.

“*Liquid waste*” means any liquid waste including used water, excluding sludge.

Based on these definitions, it is easy to clarify and distinguish the object of this thesis, but it should be emphasized that all these types of waste are inseparable from urban waste. Based on the 30-year practice of the Municipality of Vlora, during the removal and transportation of urban waste, about 30% of it is different waste, such as organic waste, household waste such as sofas, couches, mattresses, etc., as well as inert waste as a result of works that people can carry out and deposit in urban waste containers. These different types of waste, which remain the municipality’s “burden” to dispose of, have a direct impact on the methodology for compiling the cost analysis, both for vehicles and for human resources.

1.3. Waste Management Hierarchy

Law No. 10463, dated 22.9.2011 “On integrated waste management”, as amended, in its article 67, provides that waste is managed according to the hierarchy of the Waste Framework Directive 2008/98 EC (Article 3):

1. Prevention (of waste generation): Using less materials in design and production. Keeping your products for a longer time. Use of less toxic substances as possible.

2. Reuse: Checking, cleaning, repairing individual parts or the entire product as a whole.
3. Recycling: The conversion of waste into a substance or a new product including composting if it meets the quality of the protocol.
4. Recovery: It includes anaerobic digestion, energy recovery combustion, gasification and pyrolysis, with the generation of energy (fuel, energy) and materials from waste.
5. Waste disposal: Landfill and incineration without energy recovery.

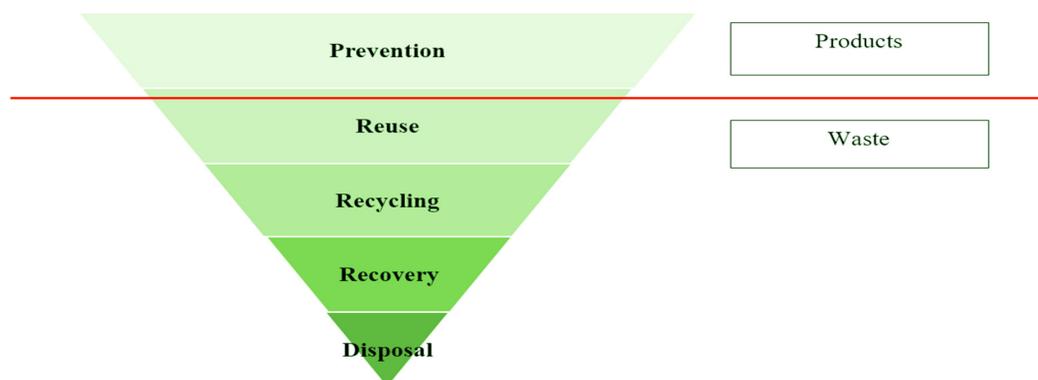


Figure 1. Hierarchy of Waste Management according to Framework Directive 2008/98 CE

Source: Own research

The aim of the Directive through the waste management hierarchy is to prevent as much as possible the generation of waste, to use the generated waste as raw materials and to minimize the amount of waste that ends up in landfill. It requires that waste be managed without harming public health and the environment and, in particular, without endangering water, air, plants and animals, without causing nuisance from noises and smells, as well as without affecting the landscape and places of special interest. The regulatory framework is accompanied by compliance systems and enforcement obligations. Many well-designed regulatory systems are ineffective because they are not enforced and monitored.

2. RESEARCH METHODOLOGY

The description of the current situation in the Albanian legislation has helped us by providing an overview of the legal obligations and institutions responsible for urban waste management, while the description of the current situation in the Municipality of Vlora has presented us with the facts on the ground, the problems that this institution faces every day. At the same time, it is explained that a feasibility study has been drawn up with the help of foreign donors, which determines in detail the evidence carried out, the risks encountered, the estimated amount of urban waste at the collection points, their conditions, etc (KfW Bankengruppe, 2015). The methodology of collecting this material, data and statistics will help us to draw up the cost analysis and the necessary funds to collect for their realization.

The calculation of the cost for the period of providing the cleaning service is based on the current methodology of the existing contracts (loading, transportation, cleaning of streets and squares, washing and amortization, waste disposal in existing areas), but changing the quantitative elements, in both volumes and financial value.

Performing the cleaning service will no longer close the loop with the waste collected in the landfills, but after a differentiated collection, it will be processed in the landfill (specially built

for this purpose). This helps our research work, as all possible/expected expenses that may be incurred should be anticipated in the calculation of funds. Currently, based on this scheme, such a methodology is proposed.

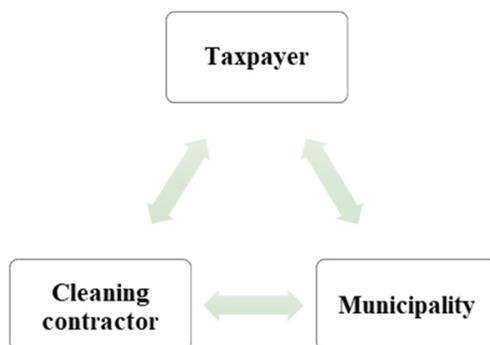


Figure 2. Previous scheme – Cleaning service (based on existing contacts)

Source: Own research

This scheme (figure 2) has turned out to be dysfunctional because the revenues collected by the Municipality do not cover the costs of the cleaning service. To cover this service, it is necessary to add other funds from the income of the institution.



Figure 3. New Scheme – Urban Waste Management

Source: Own research

In the scheme above (Figure 3), costs for processing in the landfill are added. In this situation, more income will be needed to increase their collection, not need funds from other revenues of the Municipality, but also to cover the additional costs of the landfill function. This will lead to increased cleaning efficiency for households and businesses.

The methodology will also require data on population, container points, non-container points, streets, squares, sidewalks, etc. These data are given as facts, or in other words, based on frequency/use, population size, and the frequency of service provision will be derived. For example, on Ismail Qemali Boulevard (Vlorë - Skelë Boulevard), or along the Seaside Promenade (Lungomare), street cleaning services such as sweeping and washing will receive more attention, compared to residential blocks, where the focus should be placed on removing waste and cleaning container points.

From the summary of these data, it is easily identifiable to determine the tools that will be used to perform the cleaning services or even their capacity.

Based on the actual data available in the Municipality of Vlora, the analysis will focus on the calculation of the cost of providing the cleaning service for a calendar year. Based on this annual value, the cleaning service can be calculated for a multi-year contract, which from a monitoring carried out on the website of the Public Procurement Agency turns out to be a 3-5-year contract.

3. DATA COLLECTION AND ANALYSIS

3.1. Data Collection

Based on **Law No. 139/2015 “On Local Self-Government”, Article 23 (10)** “Functions of Municipalities in the field of infrastructure and public services”, municipalities are responsible in the territory of their jurisdiction for “the collection, disposal and treatment of hazardous and household waste”. Based on Law No. 8094/1996 “On the public disposal of waste”, as amended, the municipality, through responsible structures, organizes the collection and deposit of waste by natural and legal persons, public and private, selected through the public procurement procedure, who are specialized in cleaning services and waste collection and is responsible for:

- Assigning bins, containers and concrete stations to approved waste disposal sites;
- Determining the methods and technologies used/to be used for public waste disposal;
- Approval of the regulation for the public cleaning service and the territorial division of the municipality into cleaning areas;
- Concluding cleaning service contracts with contractors for each cleaning area;
- Collection of the cleaning fee.

From the joint study conducted by the Municipality of Vlora and the Institutional Consultant, we have the analysis of the following indicators (2018):

Table 1. Daily amount of waste in the 1 year

	January	February	March	April	May	June	July	August	September	October	November	December
No. of days	31	28	31	30	31	30	31	31	30	31	30	31
Distribution of tourist traffic						15%	35%	35%	15%			
Distribution of the amount of waste						389.9	909.7	909.7	389.9			
Additional waste (per day)						13	29.34	29.34	13			
No. of residents (per night)						241,921	564,482	564,482	241,921			
Population distribution	70%	75%	80%	85%	100%	130%	155%	155%	130%	90%	80%	70%
Population for each month	109,110	116,904	124,698	132,491	155,872	202,634	241,602	241,602	202,634	140,285	124,698	109,110
Amount of waste per day	98	105	112	119	140	182	217	217	182	126	112	98
Amount of waste per day (including waste from tourists)	98	105	112	119	140	195	247	247	195	126	112	98

Source: Own research

According to the analysis due to the space and non-displacement of the containers, a total of 800 containers will be placed in 600 points in the city of Vlora and 215 in the Orikum unit. During the season, waste will be collected once a day under normal conditions and twice a day during the tourist season (to be detailed according to routes and load). During the touristic season, there will also be brigades of workers consisting of 15-20 people dedicated to specific areas, such as the Lungomare area, the City Ring, Dhimitri Konomi Street, Orikumi Promenade, etc.

Containers are mainly located in residential blocks, main roads, or at container points, while in the peripheral areas, there are also waste collection points that do not have containers but the waste is removed employing transport (the cost analysis gives the technological means, the

means of transport, the waste, the objects of disposal). The services analyzed in this study are the removal of urban and inert waste, street cleaning and washing, and the number of bins, containers and concrete stations at designated waste disposal sites. Each of them has its own characteristics to influence the realization of this service. Containers with a capacity of 1.1 m³ will be placed on the roads of the first and second categories. Containers with a capacity of 1.7 m³ will be placed in the third and fourth-category areas on the outskirts of the city. For this study, sketches of the streets and squares of the city of Vlora and Orikum that are the object of this service, as well as sketches of waste collection points and containers, have been drawn up.

4. CONCLUSION & RECOMMENDATIONS

At the end of this study, where the costs and revenues for performing the cleaning service with a focus on the Municipality of Vlora were analyzed, conclusions and recommendations have emerged which we are modestly presenting in this thesis. The acts and decisions that served for the preparation of this paper were taken from the electronic archive published on the official website of the Vlora Municipality, but also from the relevant sectors, where the author of this study, was a part of the working groups that drafted them.

4.1. Conclusion

The conclusions we drew are as follows:

- Increasing the performance of the cleaning service. This should materialize in the daily removal of urban waste, such as sweeping and periodic washing of squares, sidewalks, or streets. The performance of these services has a direct impact on increasing the quality of life, but also on improving the environment;
- The construction of the landfill will significantly improve the problem of urban waste processing, since the current landfills used in the city of Vlora and Orikum lack construction or operational measures to reduce emissions/protect the environment, thus having negative impacts on the population, flora and fauna, soil, water, air and climate;
- The increase in the collection of the cleaning fee is a dynamic process, which forces the Municipality to be constantly careful in finding forms and ways for their payment by entities benefiting from the cleaning service.

4.2. Recommendations

The recommendations given to the Municipality of Vlora:

- Special care should be taken in increasing the cleaning fee, especially with some categories that are unable to pay it. Increasing the fee directly affects the family budget;
- Increasing the number of residents who benefit from this service by extending it to all areas that are possible from the road infrastructure;
- Addition of metal containers for the collection of urban waste;
- Improving the service schedule for the method and time of extraction and evaporation of urban waste aiming at the differentiation of urban waste at the source;
- Encouraging business interest to start urban waste recycling activity.

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Dynamics of Population Structure: A Comprehensive Analysis of Romania Using Census Data and Population Pyramids

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Abstract: *Population structure is a crucial factor influencing a country's development. The population pyramids provide valuable insights into demographic trends, age group dynamics and sex differences. The study reveals that both Romania and Bucharest are experiencing an aging trend, with a greater concentration of people in middle-aged groups and a decline in the younger population. This shift has significant implications for economic, social and healthcare systems, requiring adjustments to meet the evolving needs of each age group. The population pyramid for 2021 highlights that the largest age group is 50-54 years, representing the generation born between 1967 and 1971, following the anti-abortion decree of 1966. Bucharest, as the capital city and a major economic and cultural center, attracts young people in search of job opportunities, contributing to the city's unique characteristics. The used data is the data from censuses issued by the National Institute of Statistics and findings through population are presented using pyramid charts, built with R language. These findings shed light on the demographic changes in Romania and its capital city, Bucharest, and the challenges and opportunities that will be encountered in the future.*

1. INTRODUCTION

The population structure is the primary factor influencing a country's evolution. To understand demographic trends and make improvements in socio-economic development, an analysis of the population structure is necessary. This analysis reveals population dynamics and changes between age groups and between sexes. Therefore, the population pyramid is the graphical method used to represent the distribution of the population by age groups and sexes.

According to Eurostat (n.d.), the population of the EU-28 member states has experienced a declining trend in the birth rate, while life expectancy has increased. These two factors lead to changes in the population pyramid, highlighting the shift towards aging populations. The labor force is shrinking and the number of people retiring is increasing. As the individuals born during the post-war baby boom generation retire, there will be pressure on the working-age population to support the expenses of the aging population. The low birth rate is another factor contributing to population aging, referred to as the "aging of the base". Additionally, increasing life expectancy leads to the phenomenon of the "aging of the top" of the population pyramid.

Measures aimed at increasing the population during the communist period, specifically the anti-abortion decree of 1966, led to a rapid increase in the average population growth rate in a very short time. This measure requires new measures regarding education and the healthcare system. Regarding the aging of the population, in 1948, the country's population was young, with a median age of 25.2. Until the fall of the communist regime, the proportion of elderly individuals

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began to rise, primarily due to the decline in the population of young people and with minor fluctuations caused by the anti-abortion decree of 1966.

Compared to other Eastern European countries and due to the 1966 anti-abortion decree, fertility rates increased in the immediate aftermath, leading to a population increase. This rapid growth influenced the demographic structure, resulting in a higher proportion of children and young people in the population, requiring appropriate social and economic measures and resources (such as education, care and employment).

2. LITERATURE REVIEW

In the Demographic Yearbook of Romania, issued by the [National Institute of Statistics \(2015\)](#), several population pyramids from the years 2014, 1968 and 1992 are presented. These pyramids illustrate long-term fertility and mortality trends and the medium- and short-term effects of migration. Thus, the 2014 pyramid shows an aging population due to the narrow base of the pyramid. The effects of an aging population will be seen in the labor market and the economy, through the aging of the workforce. Significant differences are also observed between the population by the legally resident population and the resident population, explained by the phenomenon of international migration. Comparing population pyramids for the years 1970 and 2014, the proportion of people over 65 has increased, while the proportion of those under 15 has decreased significantly.

According to [Saroja \(2018\)](#), there are three types of population pyramids:

1. Expansive population pyramid - with a wide base and a narrow top, describing young and growing populations. It exhibits both high fertility and mortality, with a low life expectancy. This type of pyramid is commonly found in developing countries, especially in Africa and Asia.
2. Constrictive population pyramid - describes an aging population with low fertility and mortality but longer life expectancy.
3. Stationary population pyramid - often found in developed countries where both birth and death rates are low and the quality of life is high. The proportion of the population remains constant in age groups over time. These are typical of Scandinavian countries.

[Berelson \(1979\)](#) compared Romania's experience between 1967 and 1976 with the American equivalent, the "baby boom" in the USA between 1951 and 1960, highlighting Romania's greater growth (39% compared to 34%) even compared to the first wave of growth from 1946-1955 (28%).

[Ghețău \(2007\)](#) believes that restoring fertility is the only solution that can minimize the deterioration of the demographic structure, but its effects will only be noticeable in the second half of the century. The census is the only means to obtain an accurate image of the demographic situation and, consequently, the decline. After 2000, both birth and death rates became stable, but Romania's population continued to decline, given the migratory movement. Between the 1992 and 2002 censuses, Romania's population decreased by 1129 thousand, with the majority being unrecorded international migration (62% of the total decrease). Forecasts show a massive increase in the elderly population. Romania's accession to the European Union was a major event for the entire population and the transition states through which Romania passed, both economically and socially, this fact affecting birth rates. The European Union has proven to be flexible, allowing countries to develop their policies regarding demographic evolution.

Cârstea and Domnariu (2021) believe that the fertility rate will continue to decline in the next 40 years, with the fertility rate expected to increase from 2051 onwards. One of the possible factors leading to this decline in Romania could be globalization, industrialization and the freedom of choice in contraceptive methods. According to Stanciu and Mihailescu (2018), Romania's demographic evolution has not always been linear, a fact caused by the policies and economic measures taken. Romania has gone through several demographic disasters, such as World War II, the communist regime and the revolution of 1989.

The data collected from the censuses in the years 1992, 2002 and 2011 indicate that the resident population decreased between 2002 and 2011, as well as between 2011 and 2021. According to Andrei et al. (2022), this population decline will put pressure on both the labor market and the pension system. Another factor that will disrupt the labor market is the increasing trend of external migration. From 2000 to 2012, the population structure changed as the number of departures of individuals aged 25-64 continued to rise. In 2007, 558.074 people left for more than a year, according to Andrei et al.'s (2015) study. Rotariu (2019) argues that Romania's transition since 1989 occurred alongside a demographic decline that continues to deepen.

Muntele et al. (2021) emphasize the importance of studying physical-geographical and socio-economic factors in analyzing population dynamics. These population dynamic changes occurred as Romania gradually transitioned from rural to urban. According to the book "Romania: A Century of History", issued by the National Institute of Statistics (2018), there is a clear gap between urban and rural environments, caused by the conservative and traditional attitude of the rural population. Additionally, the population in rural areas is demographically aging, unlike the urban population, which places less emphasis on customs and traditions.

3. RESEARCH METHODOLOGY

In this case study, the population structure is analyzed for both Romania and Bucharest for the years 2002, 2011 and 2021, using data collected during the respective censuses issued by the National Institute of Statistics.

For the population pyramid for the year 2021 - Bucharest and Romania, the data available up to the 80-84 age group was used since graphical representation would have been distorted and it would have been difficult to compare the proportion and distribution of the population. The next available data was for the 85+ age group, but including this would have been a methodological error, to maintain consistency in age groups every four years. This situation also applied to the three-year charts (2002, 2011, 2021) for the populations of Romania and Bucharest. However, the data available up to the 70-74 age group was used to ensure clarity and data comparability. For the year 2002, the last age group presented is 75+ years, while for the years 2011 and 2021, the last age group is 85+ years.

Three population pyramid charts were created in the R language, using three packages: `dbplyr`, `ggplot2` and `scales`. The first chart, representing the population pyramid for the year 2021 - Bucharest and Romania, is similar to a two-year population pyramid. The second and third charts represent the population pyramids of Romania and Bucharest for the years 2002, 2011 and 2021.

4. FINDINGS

The analysis of the population pyramid for the year 2021, for both Bucharest and Romania, reveals the main demographic characteristics, trends and differences between the two. When examining the population pyramid for Romania, both for males and females, the largest age group is 50-54 years, representing the generation born between 1967 and 1971, immediately following the anti-abortion decree of 1966 from the communist era.

A significant concentration is also notable in the age groups of 40-44 and 45-49 years, especially among males, representing a substantial part of the workforce. There is a smaller proportion of the age groups 0-4 and 5-9 years, indicating a declining birth rate. The age group of 65-69 years has a significant share, indicating an aging population that requires appropriate measures for the pension system and the healthcare system. Comparing the populations of 75-79 and 80-84 years with the population of 65-69 years, they show a significant decrease, highlighting that the survival rate is lower for the older population. These two age groups also have the smallest share of the total population of Romania.

In the case of the city of Bucharest, the largest age groups are 50-54 and 40-44 years, contributing to the economic and social life of the capital. Similar to Romania, the younger populations in the age groups 0-4 and 5-9 years have a lower level. A concentration of the population can be observed between 30 and 54 years, indicating their contribution to the country's economic development. Bucharest is not only the capital of Romania, but also an important economic and cultural center, attracting young people in search of job opportunities.

From a demographic perspective, both the population of Romania and Bucharest are experiencing an aging trend, with a greater concentration in middle-aged groups and a decline in the younger age groups. Thus, there is economic, social and medical pressure to take appropriate measures and meet the needs of each age group. Bucharest aligns with the general trends in Romania of an aging population but has certain unique economic and social characteristics.

Analyzing the population pyramid over three years in Romania, a significant demographic transition can be observed. In the year 2002, a balanced population with a relatively uniform structure is noticeable. The largest age group is 30-34 years, indicating an active population. This could reflect a period of economic prosperity and social stability, creating a conducive environment for young families. The population pyramid for 2002 shows that Romania is in continuous demographic growth with tendencies towards demographic aging (in the 55-59 age group). The size of the young population, the age groups of 10-14, 15-19, and 20-24 years, indicates a high fertility rate and a growing population. In some cases, there is a slight gender distribution discrepancy, with more males in certain age groups (25-29 and 30-34 years).

Comparing 2011 to 2002, significant changes are evident. The base of the pyramid is narrower, suggesting a decline in the young population and a decrease in the number of newborns. This decline may be caused by the migration of young people seeking new opportunities, both educational and career-related. It may also be attributed to the unfavorable economic period that Romania went through. There is an increase in older age groups, particularly the 55-59 age group, attributed to demographic aging.

In 2021, the aging of the population intensified. The young population continued to decrease, with the number of young people diminishing. This could be the result of both migration and a

declining birth rate. The 65-69 age group increased significantly, as did the 55-59 and 60-64 age groups, putting pressure on the healthcare, social assistance and retirement systems. The 50-54 age group has a substantial presence, representing “The Decree” generation. The gender distribution is also highlighted in the graph, with women predominating in the older age groups, influenced by different survival rates between sexes.

In general, a decrease in the proportion of young people and an increase in the elderly population is observed, deepening the aging process of the population. There are clear differences in socio and economic factors by age group differences within each age group. There are significant differences in the age group distribution between men and women and demographic fluctuations can be explained by phenomena such as migration or the decline in fertility and the increase in life expectancy. In the future, a decrease in the number of young people indicates a decline in the workforce, and the increasing number of elderly people will put pressure on the healthcare and retirement systems to provide appropriate services for this age group.

For the year 2002, the age group distribution is balanced, showing slight variations between genders. A significant proportion of the population falls within the 20-24 age group, which can be explained by the numerous higher education institutions in Bucharest and career opportunities that attract young people from other areas. Even the population in the 25-29 and 30-34 age groups is substantial and they are part of the workforce. The concentration of the population in the 45-49 and 50-54 age groups can be explained by access to medical services and better living conditions, which indirectly lead to increased life expectancy.

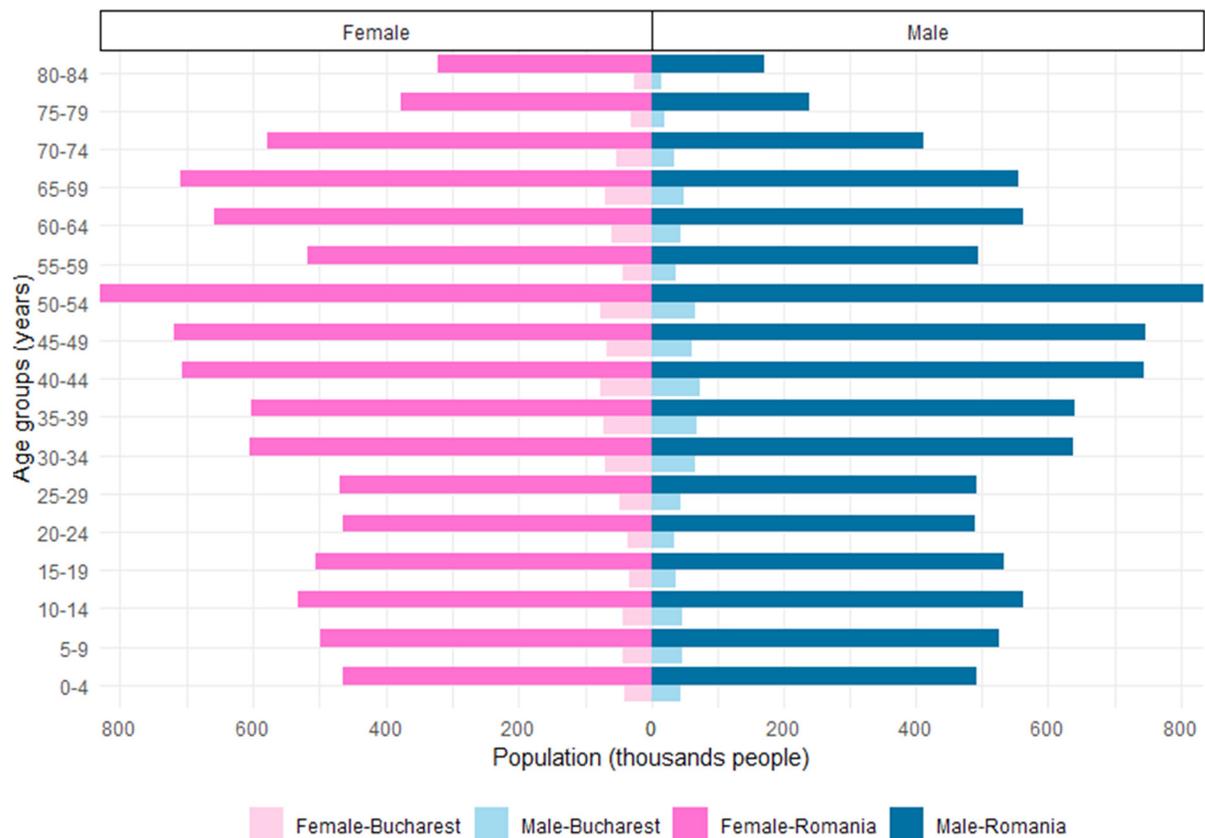


Figure 1. Population pyramid for the year 2021 – Bucharest and Romania

Source: Own elaboration



Figure 2. Population pyramid of Romania for the years 2002, 2011 and 2021
 Source: Own elaboration

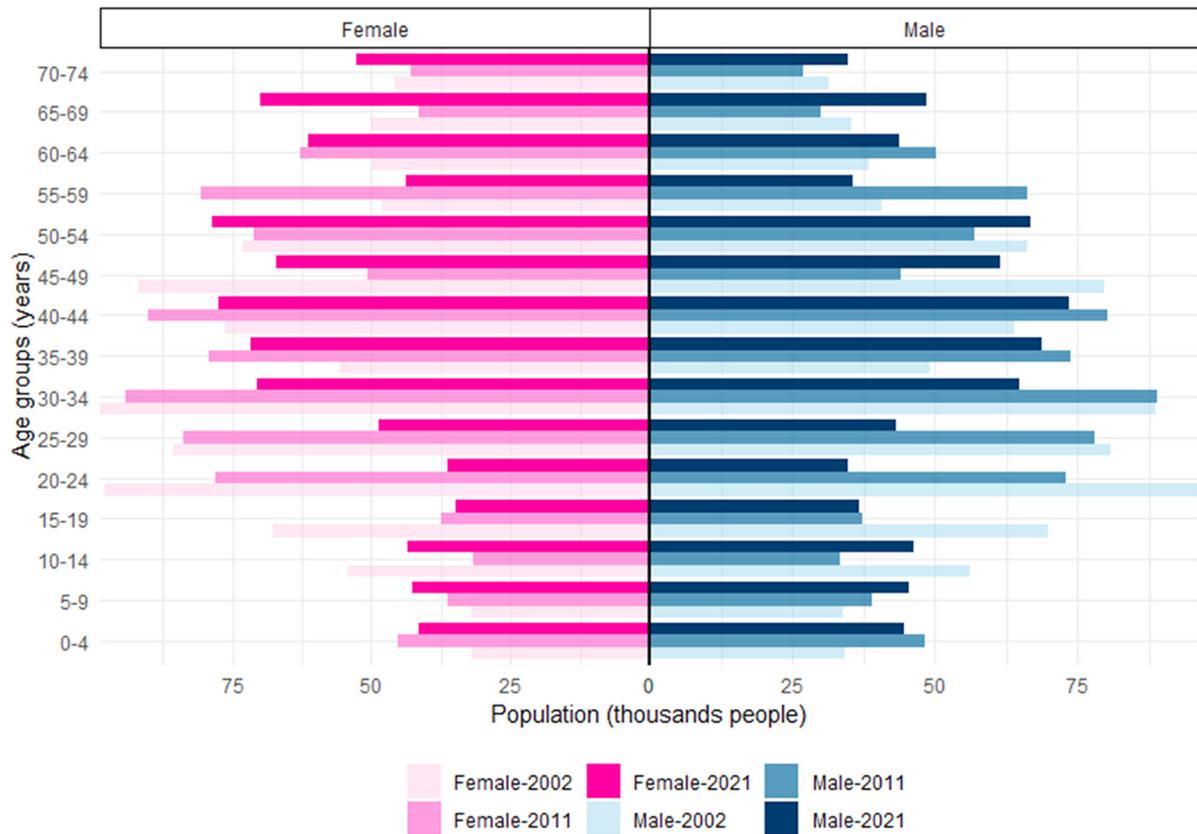


Figure 3. Population pyramid of Bucharest for the years 2002, 2011 and 2021
 Source: Own elaboration

The 0-4 and 5-9 age groups registered an increase in 2011 compared to 2002, indicating a growth in the young population in Bucharest, possibly due to internal migration. However, in 2021, there is a slight decline in the 0-4 age group. There is also a significant increase in the number of women in the 55-59 age group, explained by increased life expectancy and retirement trends. Thus, a greater concentration of the population is in the upper part of the pyramid, indicating population aging. The largest age group is 30-34 years for both males and females.

In 2021, the trend of a declining young population continues, accentuating the aging trend. Even though the number of children increased between 2002 and 2011, in 2021, there is a decrease that can have implications for the educational system and social services. The tendency of young people to delay starting a family or not having children can be attributed to the decrease in the population in the 0-4 and 5-9 age groups. The largest age group for men is 30-34 years, and for women is 25-29 years. A significant increase is observed in the 65-69 age group, requiring the adoption of appropriate public policies.

Between 2002 and 2011, most age groups experienced growth, but in 2021, there are changes in demographic trends caused by factors such as socio-economic changes, family planning, internal and external migration.

5. FUTURE RESEARCH DIRECTIONS

The findings of this study on population pyramids in Romania and Bucharest offer a foundation for extending research to other cities within Romania, or even counties. This study can be extended to the East European Countries such as Bulgaria, Serbia and Hungary, gaining a comprehensive understanding of demographic dynamics across East European countries, facilitating cross-country comparisons and highlighting regional nuances.

6. CONCLUSION

Analyzing the population pyramids for the years 2002, 2011 and 2021, both for Romania and Bucharest, several relevant demographic aspects are highlighted. The population pyramid for Bucharest follows the pattern of Romania's population pyramid, with minor modifications. The largest age group in 2021, both for men and women, is the 50-54 age group, representing the generation born between 1967 and 1971 during the period of the anti-abortion decree of 1966 from the communist era. This highlights the current effects of the demographic measures that were implemented. Bucharest attracts young people in search of job opportunities due to its status as the capital and a significant economic and cultural center. The concentration of the population between the ages of 30 and 54 indicates the contribution of these groups to the country's economic development.

The population of Romania as well as that of Bucharest show a trend toward aging, with a larger number of individuals in the middle age groups and a decrease in the young population. This places pressure on the economic, social and healthcare systems to adapt to the needs of each age group. Thus, the capital city follows the general trends of Romania but also has unique characteristics due to its status as the capital and the country's economic and cultural center.

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The Effect of Financing Political Parties in the Economy: Case of Albania

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Abstract: *The paper aims to analyze and determine the factors that affect the political parties' activities and their role in the socioeconomic life of the country. Money in politics has become more and more an element of growing influence to a determining power, so the control and transparency of this component are vital to maintaining the country's prosperity and development. The paper analyses the case of Albania, an ex-communist country, and the problems that have arisen from the use of "dirty money" for financing politics and their political campaigns. Albania needs urgently a new law on political and financing political parties, to fight corruption, and abuse of public funds and to prevent from empowerment of organized crime. Reform of political parties is needed, in order to end the power deriving from money and to consolidate the power deriving from faith and voter confidence.*

1. INTRODUCTION

The objective of the paper is to analyze the conditions of Albanian political parties and the way that politics influence the social and economic life of the country. Money in politics has become more and more an element of growing influence to a determining power, so the control and transparency of this component are vital to maintaining the country's progress and development. The development and consolidation of the political system are essential to democratic political competition. This is especially important in developing countries, as well as in those that have emerged from dictatorial systems, such as Albania and the other countries of the former Communist Bloc. The parties are the center of the political system, which serves as a mechanism for integrating individuals and groups of society with politics, based on ideology, causes, and political agendas set by the interests of individuals and groups within the party. According to this point, the system appears in balance and the parties are within the framework of the predicted function. They mobilize and socialize the general public, especially during the elections. They are centers of thinking by articulating and protecting the interests of individuals and groups. Parties fulfill an important role in recruiting the political elite, by selecting candidates for public institutions, for organizing government and administration. Therefore, they present their offer and provide political support through the vote. So far the system has been accepted as legitimate, by protecting the interests of those who have a vote. However, interests do not have only individuals and social groups with the same interests. Some interests are protected and advanced through money. At this point, the system enters a gray area, where justice more than legitimacy, is put into question. How can elections be equal among individuals, who have only the word and the vote and those who have the money and use it? Here are many dilemmas of the ethical nature, the nature of equality, and legitimacy for protecting the interests. The dilemmas are even more in a society like ours, nurtured with purist minds about the way of organizing and functioning of the political system. It is widely perceived that when parties protect the interests of a particular group, let's say the unemployed,

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or farmers, and advance them with policies that bring financial gain to those groups, this action is called normal and not “captured”. But, when a party advances business interests in a particular sector, such as construction or transport, questions arise here and politics is called clientele or “captured”. Moreover, this prejudice increases when sector operators have contributed to the winning campaign of the party in question. In both cases, interests are legitimate, as long as the decision does not yield individualized benefits but collective ones. However, it must be recognized that beyond the ethical dilemmas, in advancing its own interests, the business intervenes in the system by reducing the number of beneficiaries. All of this makes it necessary to carefully consider the issue of financing political parties.

The regulation and control of party funding cannot be seen as a process of damaging or censoring the party’s functioning and internal management. The rules regarding the financing of political parties should be applied accordingly to the funds for the election campaign, as well as to the funds for the political activities of the elected representatives. Democratic systems cannot function without money, as parties and candidates cannot disclose their platforms and policies without funding. Parties need funding to function as organizations; to be present in the lives of the citizens; need financing to run their daily political action and more to focus on election campaigns. So, there are three moments: holding the organization, financing political activities and funding electoral campaigns.

In order for political parties to develop their activities, they need enough funds. With the upgrading and sophistication of electoral campaigns, parties year after year require more funding. The need for donations and contributions at the same time increases the party’s vulnerability to attract donations in return for donor benefits. The relationship between money and politics is due to the improper influences of money in the democratic political process and the illicit enrichment of politicians. The traditional way of party financing is through membership contributions, but this has been decreasing over the years, by raising the need for party funding. Also, the demand for private donations increases, by increasing the risk of establishing a problematic link between money donations and specific political decisions. Under these conditions, buying power or influence implies party representation. Hence, it is needed addressing this problem by strengthening the transparency and accounting of political parties.

2. EVIDENCE FROM ALBANIA

The paper gives a picture of the Albanian political financing methods and the debate on regulating the financing of political parties. Legal adjustments are revised and adapted, depending on the individual context of the countries. The main concern has been the link between the funding of political parties and the influence on political decisions, which often turns out to be a corrupt practice. Besides the issue of corruption, our Western Balkan countries are facing the risk of financing politics with dirty and criminal money. These financing sources are not declared and have undefined donors. Hence, even the political parties are a key element in pluralist democracies; the gradual loss of their independence is a serious and disturbing situation. The collapse of the authority of political parties and their connection with corrupt affairs has brought an urgent need to prevent the loss of interest in the political life of citizens and the loss of confidence in the political system. The worst is when the presence of the dirty money coming from organized crime increases. To increase the credibility of citizens in the political system, it is necessary to adopt clear, but above all, transparent rules for the financing of political parties and electoral campaigns.

International organizations have increased their attention to political parties and their funding. The profiles of political party candidates and their donations have turned into important issues for the defense of democracy and the rule of law. Transparency of campaign funds and donations will make it possible to reduce the opportunities for corruption by increasing the level of equality of competition (Van Biezen, 2003).

At the moment when, despite the difficulty of ensuring the adoption of the Law on the Decriminalization of Politics and Public Administration Employees, it is not only necessary but also possible to aim and achieve the adoption of a new law on the control of finance of political parties. This implies a reformation of the entire legal framework that addresses policy funding. It is essential to review the law on political parties that covers the issue of party financing as an organization. Although this Law has been amended (Law No. 8580, dated 17 February 2000, as amended by Law No. 10374, dated 10.02.2011 and Law No.17 / 2014 dated 20.02.2015), did not serve to prevent the financial vulnerability and financial exposure of parties, as one of the key points to protect policy-making from the influences of organized financial crime and to prevent the involvement of financial crime criminals (money laundering) in public and decision-making (at each level).

Albania, as a member of many international organizations, enforces and adheres to their anti-corruption documents such as the United Nations Convention against Corruption (UNCAC), which forces states to be transparent in funding spending candidates for public positions, as well as the financing of political parties. For more than ten years, the Council of Europe through GRECO (the anti-corruption group) has sought to regulate this phenomenon that produces corruption. In this context, Albania has a good legal framework with projections for transparency, but with difficulties in the implementation of the legal basis and the effectiveness of its implementation (OSBE-ODIHR, 2017).

Table 1. Democracy Score for Albania (1 the highest level of democracy progress, 7 the lowest level)

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
National Democratic Governance	4.25	4.50	4.75	4.75	5.00	4.75	4.50	4.50	4.50	4.50
Electoral Process	3.75	3.75	4.00	4.25	4.25	4.00	4.00	3.75	3.75	3.50
Civil Society	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
Independent Media	3.75	4.00	4.00	4.00	4.00	4.00	4.00	4.25	4.25	4.25
Local Democratic Governance	2.75	3.00	3.25	3.25	3.50	3.50	3.50	3.50	3.50	3.50
Judicial Framework and Independence	4.25	4.25	4.25	4.75	4.75	4.75	4.75	4.75	4.75	4.75
Corruption	5.00	5.00	5.00	5.00	5.25	5.25	5.25	5.25	5.25	5.25
Democracy Score	3.82	3.93	4.04	4.14	4.25	4.18	4.14	4.14	4.14	4.11

Source: Freedom House, 2018

The studies made by Freedom House (2018) the country report for Albania stated that Albania is at an “average” rate as a reflection of the improvement of electoral and legal infrastructure, but with a low level of implementation in practice. Preventive measures and sanctioning penalties for parties are evaluated with the lowest search scores. Both are related to one another because poor implementation of sanctions may lead to the failure to implement preventive measures. Furthermore, the sanctions mentioned in the law do not foresee penalties beyond monetary fines and these fines are at very low levels, which do not prevent the parties from violating the law. In this context, even though the law provides punishing measures; they are not enough

to not stimulate the political party from violations about the transparency of funding funds and annual financial reports. These measures cause a deterioration of the political system and it is more than necessary that the legal sanctions be tightened and applied to political parties. On the other hand, the financial statements of political parties are well-constructed, and regular, but have no details of revenues, private donations, and annual expenditures. The table below shows the performance of election processes for several years.

According to [Freedom House \(2018\)](#), Albania has made some progress, but from 2015 to 2018 there was a decrease in points of Independent Media. This means that the media was controlled more by the government. Hence, in ten-year comparison, we can see that all Democracy scores have been aggravated. Corruption and judicial framework are the main problems in Albania.

Moreover, another way to increase the level of transparency is by drafting audit reports by independent and non-conflicting accounting experts with political parties. So, this competence belongs to the Central Election Commission, in order to increase transparency and smoothness of the audit process. The CEC plays a very important role, as it not only needs to monitor and control political parties but also control and audit their financial reports. However, the financing of political parties is regulated through the CEC through the Law on Political Parties Financing, which has deficiencies in the scope of spending ceiling and lack of financial transparency (revenues and expenses) during election campaigns (central or local). Nonetheless, it is publicly known that political activity is not carried out only during the electoral campaigns, but all over the years ([Iljazaj, 2018](#)).

The attitude of the CEC toward political forces remains at a worrying level because the CEC does not penalize the political parties based on auditing the financial reports. The auditing is performed only for the election campaign period and not for the expenses and revenues that a party has during a non-electoral year. During the electoral periods, the law provides financial funds from the state budget, which go to the political parties concerning the number of their voters, whereas parties that have received less than 0.5% of the votes nationwide do not receive funding from the state budget. Then, a significant problem arises with the financing of small parties. Who finances them during electoral campaigns and the other years?

Another aspect observed in Albania is the cost of electoral campaigns, which are very expensive compared to the Albanian economic situation and the funds approved by the state budget for the parties. This situation has brought major discussions on the sources of funding. Another issue is the involvement of political party donors in electoral campaigns and high administrative functions. This practice adds suspicion and reasonable accusation for corruption and political class capture, due to the public tender beneficiaries that often result to be the non-political donors. Also, the non-disclosure of donors and funds may bring attention to the use of money, which does not come from controlled sources, but from outlawing activities, giving political and economic immunity to persons with criminal and corruption records. This is one of the biggest problems of private financing, as unequal access to party funds affects the equality and competition of political participants. Moreover, private funding in a very substantial way could focus the influence on powerful hands, making politicians more dependent on their donors than on the interests of the electorate or their party members. The high electoral expenditure level could cause predecessor electoral outcomes, as well as undesirable dependence on the parties from the largest donors or contributors.

Freeing party candidates' spending from political parties, or lacking support from the headquarters party in most electoral districts, highlights the political activism of individuals with greater financial resources. Individual campaigns, funded by dubious sources, open the way for the political engagement of individuals who use politics for personal and clan benefits.

In this situation, it is very important to apply the basic principles of law such as equality in the campaign and principles of democracy over honest competition. The choice of candidates or public officials (at any level) outside of the illegal financial influences is a necessity in the current Albanian situation.

Transparency over party revenues may help the process of decriminalization and may keep the incriminated figures away. Transparency of incomes and expenditures for each party and candidate, as well as transparency (income and expense) not only during the campaign period, it is necessary to be carried out each fiscal year. One way to reduce this inequality is to set limits and limitations on the amount of donated money and the total amount that a party can take as a donation. This is an approach that is supported by left-wing forces in the West.

Hence, based on the economic-political instability and a still unconsolidated democracy, an opportunity to control party finances would be party financing from the state. This form of financing may reduce the impact of suspicious funding or involvement in the decision-making of persons who contribute to electoral campaigns. The reasons for public funding are: 1) the state compensates for the increase of electoral campaign costs; 2) guarantees equal and fair competition; 3) limits the money power of private funding. This is an ethical approach, but it risks increasing the dependence of political parties by the state. We should keep in mind that this solution would encourage political parties to depend on public money and "protecting the interests of those whom they represent" would require more and more money". However, Albania's fiscal situation, with a state budget crisis and public debt of 72%, would not allow this as a solution (International IDEA, 2014).

Under these conditions, when both public and private financing forms have their risks, then the best solution could be the interruption of some resources. These resources should have a controlled percentage so that no donation would affect the decision-makers. Fixed limits should be set on some sources as well as the amount of private donations, while public funding should be allocated to accounts, which should be subject to external audits by experts authorized by public bodies.

3. EMPIRICAL FINDINGS AND REGRESSION ANALYSIS

We preceded our study by analyzing the effect of political financing from the government budget on the economic growth of Albania. We got as the dependent variable the GDP growth rate and the independent variables are the total income of the budget, the total government expenses and the political party financing. The serial data are taken from the Ministry of Finance database from the year 2003 to 2017 and we used the E-view program to run the regression. The sample is small, because of a lack of statistical data. The data are taken from the World Bank (2023) and the Ministry of Finance (2023). Nevertheless, this is an introductory model, in the political financing area, which will be further explored.

So, we can write the regression model and the mathematical one as:

$$\Delta\text{GDP} = f(\text{TI}, \text{TE}, \text{PF})$$

$$\Delta\text{GDP} = \alpha_0 + \beta_1\text{TI} + \beta_2\text{TE} + \beta_3\text{PF} + \varepsilon$$

Where:

ΔGDP is the change in the economic growth

TI = total income in the budget

TE = total expenses of the government

PF = political financing

ε = error correction term

α = the coefficient of the model

β = the coefficient of the variables

By using the E-view program we got the statistical results:

$$\Delta\text{GDP} = 36 - 0.0042\text{TI}_{2} + 0.026\text{TE}_{5} - 836.2\text{PF}_{1} + 16.7 \quad (R^2 = 0.87)$$

Hence, from the results, we can say that if the TI increases by 1%, then the GDP growth will decrease by 0.0042% after two years. If the TE will increase by 1%, then the GDP growth will increase by 0026% after five years, and if the PF will increase by 1%, then the GDP will decrease by 836.2% after one year.

So, from the above results, we can argue that the government's political financing can affect highly the economy. However, we are all conscious that parties have more funds (hidden donors) for their campaigns, which affect the economy during the months of elections, but we cannot measure the impact of this money, because there is no evidence on the balance sheets of the parties.

In these conditions, we do the Granger Causality Test, in order to see the causality direction.

Table 2. Granger Causality Test

	Hypothesis		Prob.
TI	→	GDP	0.04
GDP	↘	TI	0.11
TE	→	GDP	0.06
GDP	↘	TE	0.29
PF	↘	GDP	0.50
GDP	↘	PF	0.92
TE	↘	TI	0.22
TI	↘	TE	0.44
PF	↘	TI	0.38
TI	↘	PF	0.55
PF	↘	TE	0.32
TE	↘	PF	0.45

Source: Own calculations

Hence, from the above test, we can see that the total income in the budget and the total expenses have an impact on the GDP. None of the other variables has a cause-effect on each other. This

can be argued that the real problem is the statistical data of political financing. These figures are not true, because Albania lacks transparency on political financing. Political parties do not declare all the financing sources, amounts and expenses. Hence, this indicates the gross amounts of money that circulate during the election periods and campaigns. Surely, this money affects the economy, but the real effect cannot be measured.

4. CONCLUSION

From the analyses conducted in the previous sections, the political parties in Albania have failed in the transparency of the financial funds and their declarations. For this, a special provision for declaring and transparency of funds is suggested, where the CEC should apply severe sanctions if the law is not respected. Annual reporting of financial funds should be submitted separately from the electoral years. Also, the CEC should adopt mechanisms to control and deter political parties from using public offices and governmental institutions of the ruling party for campaign purposes. However, a problem that may arise from the obligation to fund transparency is the political persecution of party donors. Albania is still a country with an unconfirmed democracy, where personal data and activities are not protected and secret. So, it would be advisable to accept secret donations, but in amounts set by the law. Albania has a law on party financing, but has no control over reporting and reflection of funds; there is no limit to private donations and there is no limit to electoral campaign spending. The elaboration of the Law should also review the above points.

The Law on Political Parties in Albania prohibits political parties from benefiting from monetary or material donations from foreign governments and public or private entities but allows gifts and assistance from international parties, political organizations, or foundations. Also, the law prohibits donations from private sources, which do not pass from the banking system; donations from people who have activity in the media sector; and donations from individuals or private activities that have benefited from public funds.

The current legal regulation is made by two different laws, one for political parties, covering the party financing aspect as an organization, and the Electoral Code, which covers campaign financing. This tradition comes from the concentration that political parties have, by controlling the sources of power. This tradition can continue with adjustments and changes in each law. However, a better solution would be to draft a new law covering all aspects of financing the policy, organization, activity, and campaigning. A new law will give solutions to issues such as: liberalization or limitation of private funding; finding a reasonable balance between public and private funding; restrictions on the obtaining of posts or public money for policy-makers; criteria and mechanisms of maximum and effective transparency; independence and credibility of control over party expenditures related to election campaigns and total transparency of financial statements; sanctions and penalties for parties or candidates who break the law.

This is a matter of political will. There is little talk at the moment, as much is said about the consequences, corruption, clientele and decision-making, but it is not about one of the main sources of funding for business parties and black money. There is nothing left to hope that, despite the constraints to prevent involvement as political actors of the incriminated persons, we are taking another crucial step to clear the policy out of capture. This reform is indispensable not to end in the power deriving from money, but to the power deriving from faith, voter confidence, and not money.

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Optimizing Contracting via Performance-Based Contracts

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Abstract: Economic theory regards the contract as a trading instrument that provides an optimal allocation of scarce resources (Posner, 1973). In this view, the economic utility of the contract is conferred by its binding force, and its binding force is justified by its ability to increase general welfare. Contract formation is an essential starting point in economic analysis. The need to conclude contracts with clear and well-defined terms is pressing. Primarily, a defective, incomplete contract, formulated in contradictory terms, is an invitation to default (Almășan, 2018). Secondly, as a result of non-execution, the contracts in question are referred to the courts, which have the difficult task - of ascertaining the real intent of the parties and giving it legal effect. The proliferation of problematic contracts has led to the undeniable reality that the courts are burdened with such disputes, which could easily have been avoided by better ex-ante consideration. In response to these inadequacies, Performance-Based Contracts have emerged. The development of performance-based contracts has been a collaborative and evolutionary process, influenced by academic research, economic theories, and the practical needs of organizations in various sectors. In light of the above, the article aims to analyze the advantages and disadvantages of performance-based contracting, the implications of the widespread use of this contracting method and its prospects.

1. INTRODUCTION

A performance-based contract is a strategic and dynamic agreement between two or more parties, wherein compensation is intricately tied to the achievement of pre-defined and measurable outcomes or results rather than relying solely on inputs or efforts. This contractual arrangement is designed to incentivize optimal performance by aligning the interests of the contracting parties, fostering a results-oriented approach that emphasizes quality, efficiency, and the successful realization of specific performance metrics (Martin, 2005).

The management and structuring of performance-based contracts in buyer-supplier relationships were first observed as an issue of governance and control (Ring & van de Ven, 1992). Initially, the US Department of Defense pioneered the use of these contracts in military systems, showcasing considerable value owing to the inherent complexities and extensive scale of the projects.

Examining the theoretical perspectives, it can be inferred that the conceptualization of the design and management of Performance-Based Contracts (PBC) revolves around three core dimensions: performance, incentives, and risk.

Performance: involves the processes and practices of defining, measuring, evaluating, and reporting performance. Performance-Based Contract (PBC) design includes specifying relevant outputs and/or outcomes and designing associated performance indicators (Mohammadn-ezhad-Shourkaei et al., 2011).

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Incentives: pertain to the arrangement of financial and non-financial motivators and their influence on supplier behaviour. This is chiefly associated with the payment structure, encompassing financial rewards and/or penalties, their direction, and intensity (Maille & Collins, 2012). It's essential to highlight that poorly constructed incentives have the potential to detrimentally affect specific customer segments or elements of the service. For example, a study on Kigali Bus Network (Jokinen et al., 2021) linked the performance-based compensation scheme with „faster driving (possibly due to drivers aiming to accrue a higher income) compared to the fixed-wage system.”

Risk: involves the distribution of financial and operational risks, which is contingent on the risk attitudes of the contracting parties (Kim et al., 2007). A key aspect of Performance-Based Contracts (PBC) is the transfer of risk to the supplier, as their rewards are linked to the accomplishment of performance targets.

2. TRADITIONAL CONTRACTS VS. PERFORMANCE-BASED CONTRACTS

To better understand what a performance-based contract is, a brief comparative analysis with the traditional contract is necessary.

Main focus of the contract: A traditional contract emphasizes the inputs, processes, or efforts expended by the contractor, while the PBC contract focuses on the desired outputs (or outcomes).

Risk allocation: in traditional contracts, the client typically bears more risk, while the contractors may not have strong incentives to exceed performance expectations. On the other hand, in PBC contracts, the contractor assumes more risk as payment is contingent on meeting specific performance criteria. This can incentivize contractors to innovate and find efficient ways to achieve objectives (Datta & Roy, 2011).

Payment structure: traditional contracts link payment to inputs like the time and materials used, regardless of the outcomes or results (Jain et al., 2013).

Performance Metrics: is the key element to differentiate the two categories; while in traditional contracts the performance metrics are usually not included, PBC clearly specifies measurable performance metrics, milestones, or objectives that the contractor must achieve.

Incentives and Penalties: Traditional contracts focus more on penalties than incentives, while PBC incorporates incentives for exceeding performance targets and penalties for failing to meet them.

Monitoring and Evaluation: in classic contracting, monitoring often focuses on compliance with contract terms and specifications, whereas in PBC the contractor is object to evaluations regarding progress and success in meeting the specified performance standards.

Long-term contractual relationship: Whilst both types of contracts can be used for long-term contracts, the performance-based contract is more likely to encourage a collaborative relationship, as success is tied to achieving mutual goals (Lane, 2005).

Flexibility and Innovation: usually, the PBC allows greater flexibility in how the contractor achieves the desired outcomes, promoting innovation and efficiency, as opposed to traditional contracting.

In effect, the two categories are not incompatible. Parties may use a combination of contract types based on the specific requirements of different projects. Moreover, the authors claim that most PBCs are hybrid schemes, combining fixed payments with variable payments. While a 5-10% benefit offers certain incentives for performance, a genuine PBC should target a minimum of 20 or 30% of the compensation distributed through variable fees, in order to include not only profit but also a portion of the contractor's costs (Carron et al., 2013).

3. ANALYSIS

In this section, we will examine different types of performance-based clauses in comparison with traditional contractual clauses in order to determine whether their use can optimize contractual relationships.

We will observe that sometimes, traditional contracts remain silent on aspects expressly regulated by the PBC. For this study, the provisions of the Romanian Civil Code will be used to determine the default rules applicable in this situation.

3.1. Performance & Quality Metrics

In a traditional, input based contract, such a clause shall have the following content: *„The Contractor agrees to provide utility services including service delivery, maintenance and emergency response. Emergency service requests shall be addressed promptly and the Contractor shall aim to minimize service downtime during scheduled maintenance”*

In the default of quality specifications article 1231 of the Civil Code applies: *„When it cannot be established according to the contract, the quality of the service or its object must be reasonable or, depending on the circumstances, at least of an average level.”*

Whereas, in a PBC, the same clause can have the following features: *„The Contractor shall maintain a minimum service uptime of 99.5% for the contracted utility services, measured on a monthly basis. The Contractor agrees to respond to emergency service request within 2 hours of notifications, as measured from the time of initial contract to the arrival on-site. The Contractor shall complete scheduled maintenance tasks with a planned downtime not exceeding 1% of the total annual operational hours, as measured on an annual basis.”*

As we can observe, the former drafting of the clause, corresponding to the PBC model offers a fully specified quality of performance and describes the essential indicators. At first glance, it would appear that this model is arguably more efficient in terms of contract architecture. The most important issue that could arise, however, is that of monitoring performance factors. An objective, impartial and effective mechanism must therefore be put in place in order to avoid possible subjective interpretations. Eventually, monitoring should be placed in the responsibility of an impartial third party.

3.2. Payment

We imagined a traditional contract payment clause in a contract for the provisions of service: *„The Contractor shall receive a fixed monthly payment of \$X representing compensation for the standard provision of utility services outlined in the contract. Payments will be made on a monthly basis, within 30 days of the receipt of an invoice from the Contractor.”*

In the same type of contract, but using PBC principles, the clause would provide: *„Payment will be directly linked to KPI (key-performance indicators), including service accuracy, response time, customer satisfaction and environmental impact. The Contractor will receive a 15% payment increase for achieving 90% customer satisfaction rating and a 10% reduction in environmental impact. For every 5% improvement in service accuracy beyond baseline, an additional 5% payment increase will be applied. Payments may be adjusted upwards for surpassing agreed-upon targets or downwards for underperformance, with adjustments not exceeding 10% of the total contract value in any given quarter. The total cumulative payments over the contract term shall not exceed 110% of the total contract value, unless mutually agreed upon in writing by both parties.”*

A comparative analysis reveals the maximization of contractual efficiency using the Performance Based Model. Clearly, the service provider will have the intention to improve the quality of the services provided, knowing that it is likely to either increase or decrease the correlated performance. The issue raised above, concerning the clarity of the definition and interpretation of KPIs, remains in question. We therefore find that the PBC model will provide the best results in a contractual relationship based on good faith.

3.3. Quality Assurance

A traditional contract, for example selling a car, will usually state, that the buyer acknowledges the fact that the vehicle is sold „as-is” without any warranties, either expressed or implied, regarding its condition, performance, or fitness for a particular purpose.

The Civil Code, in Article 1714, states that the provisions regarding the warranty against hidden defects also apply when the goods sold do not correspond to the qualities agreed upon by the parties. Therefore, if the parties did not expressly agree on any quality, the article is inapplicable.

On the other hand, a typical PBC clause regarding the same matter would have the following content: *„The Seller shall ensure that the sold car meets or exceeds the following quality standards during the warranty period: The Seller guarantees that the car will be free from defects in materials and workmanship, and it shall perform in accordance with industry standards. The car must comply with all applicable safety standards and regulations, with specific attention to brake performance, airbag functionality and other safety features.”*

It is a known fact that people, in general, do not attach importance to contractual provisions, often not even reading them. When they go to court, they try to prove that the seller has assured them of certain qualities of the goods sold, but in the absence of a written clause, their chances of winning are almost non-existent. From this point of view, the Performance Based contract is, par excellence, much more effective in meeting the need to prove the extent of the obligations assumed by the contract and the mutual expectations that the parties have.

4. ADVANTAGES & DISADVANTAGES OF USING THE PBC MODEL

From the practical examples above, we deduce that the use of PBC has many advantages, such as cost control (because payment is tied to the KPIs, the mechanism leads to better cost management and efficiency), continuous improvement (the contractor, as shown above, will seek to enhance the processes and performance to meet or exceed the agreed-upon standards), focus on customer satisfaction (but not always, as we have seen in the Kigali bus-driver example) and not

least, objective evaluation criteria (if only the contract architecture provides an impartial evaluation and the contractual relationship is based on good faith).

As for the disadvantages, some of which we have already mentioned, we note: the complexity of measurement, which can often lead to a potential for disputes, especially when there is a disagreement about the interpretation of performance metrics, the achievement of the goals or the calculation of the incentives, penalties. We also note that there are types of contracts that are not suitable for a PBC model, especially those that are difficult to measure in terms of outcomes, or if the goals are subjective. Another disadvantage in using PBC, we think, is the overreliance on metrics, that could cause a narrow focus, overlooking broader projects or service improvements that may not be captured by the chosen indicators.

5. CONCLUSION

Lack of clarity on scope and goals is one of the pitfalls of contracting. Contract formation is an essential starting point in economic analysis. The need to conclude contracts with clear and well-defined terms is pressing. Primarily, a defective, incomplete contract, formulated in contradictory terms, is an invitation to default. Secondly, as a result of non-execution, the contracts in question are referred to the courts, which have the difficult task - of ascertaining the real intent of the parties and giving it legal effect (Almășan, 2018). The proliferation of problematic contracts has led to the undeniable reality that the courts are burdened with such disputes, which could easily have been avoided by better ex-ante consideration. It seems that Performance-Based Contracts offer a practical solution to this problem. But as we have seen, it is not a universal remedy and should be used with caution.

In the pursuit of optimizing contracting methods, the utilisation of Performance-Based Contracts emerges as a transformative strategy placing importance on contract architecture and on meticulously crafted clauses.

Nevertheless, the successful optimization of contracting through Performance-Based Contracting (PBC) necessitates a thoughtful examination of potential challenges, as it might not be well-suited for every type of project or service.

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Implementation of PPP Contracts: Pros and Cons

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Abstract: *PPP contracts are now widely spread all over the world, including both developed and developing countries, especially in getting major infrastructure projects built. They consist of a large private sector participation, aiming to achieve efficiency and effectiveness. Sometimes, happens that these projects fail to find the best level of private-sector participation. There are some reasons behind this: the fact that the public and private sectors think differently about the risk of such projects, corruption level, lack of effective policy, institutional framework, macroeconomic situation, etc.*

There is a difference between PPP contract implementation in developed and developing countries. There are some challenges in developing countries, such as lack of effective policy, poor planning, the country's macroeconomic situation, level of corruption, etc. Through a descriptive analysis, this paper shall argue some of the benefits and some risks of the implementation of PPP contracts for developing countries including Albania.

1. INTRODUCTION

Traditionally, governments of different countries have provided their funds with public goods and services, but in recent decades, public-private partnerships (PPP) have evolved intending to bring together the public and private sectors in offering and developing public infrastructure services and assets. Significant use of PPP-s has been seen since the 1990s, considered the preferred tool for public procurement for the provision of infrastructure and services (Batjargal & Zhang, 2022). PPPs are seen as a new perspective for the development of fields such as construction, finance, transportation, education, information technology, etc. PPPs are a relatively new concept, developed in Anglo-Saxon countries (Chen & Man, 2020) and spread to Europe, Asia, and so on. In Europe, the idea was spread by Alfred Eiffel, who constructed the Eiffel Tower with his funds, with the main condition to have the right to issue tickets for 20 years, providing an example of an innovative approach. The first use of PPP by the British government (Meng et al., 2020) was in 1952. Despite the form of PPPs, the main aim of the government is to develop infrastructure and to improve the quality of it and the workforce, reduce some financial pressures, ensure economic, environmental and social sustainability, and enhance the economic efficiency in projects that aim for the provision of public goods. On the other hand, the private sector aims to secure profits as well as to increase the value of their “name” and their reliability in the market.

Despite the benefits of such kinds of projects, usage, and implementation of PPP projects remain a challenge for all parties: public sector, private sector, and community. There is a great need for both the public and private sectors, to plan carefully the form and the risk of PPP. If not, there is a risk of reduction of the sustainability of these projects, and the worst scenario is their failure. The community plays also an important role in accepting and trusting these projects.

There is a difference between PPP contract implementation in developed and developing countries. There are some challenges in developing countries, such as lack of effective policy, poor

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planning, the country's macroeconomic situation, level of corruption, etc. Through a descriptive analysis, this paper shall argue some of the benefits and some risks of the implementation of PPP contracts for developing countries including Albania. The first part shall give an overview of some reasons for implementing PPPs, concluding on their main benefits and challenges. The second part describes some types of PPP projects implemented in some developing countries, including Albania, highlighting some major problems and their challenges. The last part gives some conclusions and recommendations for a better and more sustainable process of designing and implementing public-private partnerships.

2. SOME REASONS OF IMPLEMENTING PPPS

Public-private partnership is defined by different authors and institutions. [Strasser et al., \(2021\)](#) refer to them as a term that can be utilized to define a broad category of activities and structures linking with public and private sectors. PPPs are defined also as a partnership that involves a long-term contractual arrangement between the public and private sectors where mutual benefits are pursued ([Liman et al., 2021](#)). The result of this cooperation according to [Rogowski et al. \(2022\)](#) should be a lower cost of the project and a higher quality of services than if they were financed with public funds. International Monetary Fund (IMF) refers to them as an arrangement where the private sector supplies assets and services that traditionally have been provided by the government. In this context, PPPs have two other important characteristics: there is an emphasis on service provision, as well as investment, by the private sector; and significant risk is transferred from the government to the private sector. The Organization for Economic Co-operation and Development (OECD) specifies PPPs as an agreement between the government and one or more private partners according to which the private partners deliver a service in case the government fails to comply with their objectives of service delivery and they are aligned with the profit objective of the private partners, where the effectiveness of the alignment rely on the sufficient transfer of risk to the private partners.

In their definition, [Wang and Ma \(2020\)](#) emphasize a benefit of PPP which is ensuring sustainability. The collaboration between the 2 sectors ([Thompson & Arowosafe, 2020](#)) brings resources such as authority, knowledge, money, and property. PPPs may increase the amount of capital for infrastructure investments and efficiency of operation through the transfer of private sector expertise, even though these benefits would not always be automatically realized for every project ([Ahwireng-Obeng & Mokgohlwa, 2002](#); [Bajwa et al., 2018](#)). The PPP model tends to be beneficial for the whole economy as well as for both involved parties ([Donaldson & Hornbeck, 2016](#)). Public-private partnerships allow large-scale government projects, such as roads, bridges, or hospitals, that can be completed with private funding. In developing countries, PPPs seem to provide several advantages and opportunities in terms of fiscal stabilization, fund flows, and efficiency gain.

Some advantages of PPP projects are:

- In terms of economic growth: A successful PPP project can foster economic growth. According to [Shediac et al. \(2008\)](#), there are at least three ways in which PPPs can foster economic growth:
 - A higher rate of GDP is related to A larger number of PPP projects;
 - A successful PPP happens in countries that have established legislative frameworks promoting transparency and competitive procurement processes ([Mofokeng et al., 2023](#))
 - More financial resources and more injected investments into the economy when there is a higher value of the project.
- In terms of return on investment (ROI): an ROI on a PPP project may be greater than in traditional projects.

- In terms of market structure: According to [Dashkalova \(2019\)](#), PPPs are seen as an alternative to the monopoly of the public sector and to as well as full privatization. Using the PPP model, both the public and private sectors obtain rights of ownership and joint responsibility in providing quality infrastructure services.
- In terms of efficiency: According to [Chojnacka \(2021\)](#), PPPs are faster and more efficient than traditional forms of investment.
- In terms of quality: According to [Dechev \(2015\)](#), effectiveness achievement, high-quality product ensurance, and efficiency in product and service delivery, are the main advantages of PPPs.
- In terms of costs: the PPP model ([Dordevic & Rakic, 2021](#)) is an incentive for the private partner to design and build assets at a low price and less maintenance costs. This happens until the asset is returned to the public sector and when the contract term ends.
- In terms of welfare: According to [Dashkalova \(2019\)](#) PPPs are seen as a model that makes a substantial contribution to the reduction of the significant socioeconomic disparities in different regions and countries.

In implementing a PPP project, the public and private sectors should have comprehensive information and understanding of the relationship between economic factors and PPP arrangements, important not only for the efficiency of PPPs but also for the mutual benefit of the parties. PPPs are mainly used in infrastructure projects because infrastructure is considered a critical sector for economic development, and therefore reducing poverty, assuring equality, creating jobs, and ensuring environmental sustainability. Meanwhile, infrastructure investments are long-term and therefore not easily improvable. Taking into consideration that infrastructure services can often be risky turning into monopolies, long-term sustainability is of the utmost importance ([World Bank, 2016](#)).

The decision to implement PPPs is based on several factors including:

- How it allows optimal risk allocation and cost minimization of entering a new market by pooling human and financial together, emphasizing value for money concept;
- Constraints in financing options;
- Assuring extension of operational performance. This goal acquire competence and technical know-how;
- Ensuring efficient channels of distribution, forming new products and services, and attaining higher levels of productivity and economies of scale among others;
- Well-established property rights and bureaucratic quality;
- Debt level and country size were the most important determinants of PPP activities ([Hamami et al., 2006](#));
- Improvement of multiple challenges including poor service quality, shortage of various resources such as money, workforce, and existing managerial problems;
- The desire to reduce the corruption and collision among investors, contractors, and government officials, and enhance greater transparency in procurement processes ([Purbo et al., 2020](#))

Even though, PPPs are widely spread in the world, because of their advantages making them successful cases, there are also some weak spots and potential disadvantages:

- PPPs are a procurement process more complex than traditional procurement processes;
- PPPs are more exposed to the political changes;
- They can have problems with public belief;
- Higher transaction costs;

- The cost of private financing includes a risk premium in the form of a margin in interest rates and the equity Internal Rate of Return (IRR) which is a more expensive financial instrument than the alternative of direct government financing (APMG International, n.d.);
- For countries with less sophisticated accountability and fiscal monitoring regimes, PPPs can result in excessive budget commitments, threatening long-term fiscal sustainability;
- PPP implies rigidity in budget management. In this case, there are possible potential re-negotiations of a contract to decrease costs in unforeseen situations, but this can result in huge costs.

To reduce these disadvantages, a careful evaluation is needed to be conducted about the potential factors that may affect PPP success. Prerequisites of having successful PPP projects:

- A private firm's PPP preference should be based on a thorough evaluation of the economic and political conditions;
- The government may need to influence the designing process and the financial structure; understand the demand for services, set a price that is affordable for both consumers and governments, and assess and mitigate the environmental and social impacts of projects;
- An effective procurement process that ensures the selection of the private sector based on merit;
- Alignment with the government's objectives and policies;
- Strong project management ensuring the delivery on time, within budget and according the quality standards;
- A well-structured project;
- Supportive economic policies (Ismail, 2013);
- Leadership and managerial experience, human resource management;
- Good relations between cooperating parties;
- Transparency and accountability from each party.

3. DEVELOPMENT OF PPPS IN SOME DEVELOPING COUNTRIES (SOME CHARACTERISTICS AND DISADVANTAGES)

Although definitions of PPPs conclude on the same point, which is an agreement between public and private sectors in realizing different public goods, each country has its concept and definition of public-private partnership. This varies on their legislative framework and strategic viewpoints. Developing countries continuously face some challenges in achieving their objectives in the infrastructure field, such as budget constraints, lack of investments, higher demand for better infrastructure services, lack of human resources conducting public projects, etc. According to Kahyaogullari (2013), there is a significant difference in the governmental aims and the way PPP policy penetrates the political agenda, between developed and developing countries. Developed countries are more concerned with micro issues while developing countries aim to achieve macro targets (Appuhami et al., 2011). According to Mital and Mital (2016), since the 1980s, PPP has been gaining global popularity as a viable alternative to public funding for building and financing infrastructure projects. According to the World Bank, more than 134 developing countries apply PPPs, contributing about 15–20 percent of total infrastructure investment, utilized mainly for advantages in off-budget funding, anticipated efficiency gains, and improved service quality. In developing countries, they are seen as a mechanism to fulfill their responsibilities in offering public infrastructure and service (Colverson & Perera, 2012). If public-private partnerships (PPPs) are implemented well, help overcome inadequate infrastructure that constrains economic growth,

particularly in developing countries. While there are benefits to well-designed and implemented PPPs, they also carry a potential for large fiscal risks and increased costs if not managed well (Martijn et al., 2023).

In Europe, PPPs have been primarily used for infrastructure. PPPs in Europe tend to be concentrated in the transportation sector, in terms of the value of projects. By the number of projects, PPPs in transport remain important, though education and healthcare were dominant in the mid-2000s. According to Martijn et al. (2023), in the Western Balkans, while the number of PPP projects has remained low relative to the EU-15 countries and Central Eastern and South-eastern (CESEE) countries, they account for a relatively large share of GDP and total capital stock. PPP capital stock as a share of GDP and of total capital stock in the Western Balkan countries have been rising since 2005, with a sharp acceleration in 2012/13. As of 2019, this share is higher in the Western Balkans than in the EU-15 or CESEE countries. Annual PPP investment as a share of GDP is more volatile but has also grown since 2005, particularly in Albania, Bosnia, and Serbia. While these data might not be fully comparable, they broadly suggest that PPP projects in the Western Balkans tend to be larger in percent of GDP compared to PPP projects in the EU. This implies that the failure of an individual PPP project could create a larger burden for these countries.

A descriptive analysis of two case studies: Devolli Hydropower Plant and Egnatia Highways shall give a better overview of some benefits and challenges of PPP projects in developing countries and a better understanding of the pros and cons that we analyzed theoretically above. In the first case, in the Devolli Hydropower Plant case we will analyze some of the pros, while in the case of Egnatia Highways, we will see some of the cons.

3.1. Devolli Hydropower Project in Albania

Firstly we will analyze the Devolli Hydropower Project which consists of the designing, planning, construction, and operation of hydropower plants. The project started the first activities on the ground within the Pre-Construction Phase in 2009. In 2013, the construction of HEC Banja began, which was completed and entered into operation in 2016. The construction of Moglica Hydropower began in 2015 and the operation of the hydropower plant began in 2020. The investment cost of the Devolli Hydropower Project is around 590 million Euros (Statkraft, 2023).



Figure 1. KOMAN Hydropower Plant and BANJE Hydropower Plant

Source: Own research

Some of the advantages in the case of **Devolli Hydropower Project** are:

- **Faster project completion:** Time-Saving.
The Fierze hydropower plant was built in 7 years and the work for its construction began in 1970. The Fierza Hydropower Plant (HPP) was constructed using predominantly Chinese equipment, yet it was based on the designs and concepts developed by Albanian engineers. Similarly, the Koman hydropower plant took 8 years to build. Meanwhile, the Banja and Mogllice hydropower plants were built in 4 and 5 years respectively. So, one of the benefits of PPP-s is time-saving. Beyond the potential benefits, it is important to note that the success of PPPs in terms of time efficiency depends on elements such as effective project management, clear contractual agreements, and strong oversight mechanisms. Also, another element that could affect the overall effectiveness of PPPs in delivering infrastructure projects at the right time is the regulatory framework, local conditions, and the engagement of interested parties.
- **Greater return on investment.**
This implies that there may be a chance to increase the return on investment for a given project by fusing the assets and knowledge of the public and private sectors. A return on investment could take many different forms, including more revenue, economic growth, better public services, or better infrastructure. In certain situations where PPP contracts are implemented well, the partnership between the public sector (state) and the private sector could lead to a more favorable return on investment (ROI) for both parties. *The state hasn't funds.* Governments may have restricted funding for large-scale projects or budgetary restrictions, especially in emerging nations or during economic downturns. Under such circumstances, the state may find it difficult to fund important infrastructure projects, impeding development and economic progress. Whereas, *the private doesn't have time.* The private sector is often driven by efficiency and profit motives, as soon as possible.

3.2. Egnatia Highway (EH) in Greece

The other case that will be analyzed in this paper is **Egnatia Highway (EH)**. Egnatia Highway, spanning a total distance of 657 kilometers, serves as the main road axis in Northern Greece, linking the port of Igoumenitsa to the primary Greek-Turkish border.

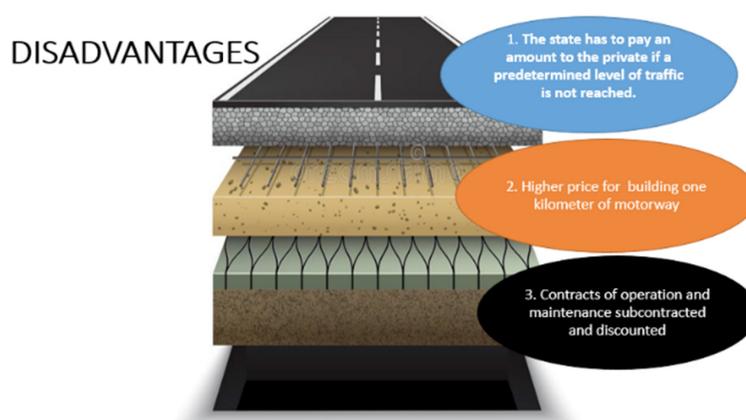


Figure 2. Disadvantages in the case of Egnatia Highway

Source: Own processing

The project for the completion of the main axis had an overall budget of approximately €5.6 billion. When comparing the years before and after the EH operation (data up to 2011), it seems that there has been a 60% decrease in fatal injuries and a 70% reduction in vehicle accidents on

Northern Greece's main road networks (Vatikiotis & Zarotiadis, 2021). This may seem good but there are some disadvantages in the case of Egnatia Highway.

- **The state has to pay an amount to the private if a predetermined level of traffic is not reached.**
The seven concessionaires requested from the State a total amount of €83.41 million (2020). One of these concessionaires is Egnatia Highway. These claims directly contradict the interest of Greek taxpayers, and other businesses that have to find their profit in the free market and are not guaranteed by the state. The difference is both qualitative and quantitative, as in this case, we are dealing with a reimbursement of profits.
- **Higher price for building one kilometer of motorway.**
It is also estimated that in Greece **one kilometer of motorway is worth up to EUR 65 million**, while the most expensive project in the other Community States is paid for by the State at most EUR 20 million per kilometer (Kadda, 2009). Concessions did not reduce the costs for the Greek state and taxpayers or highway users. On the contrary, concessions proved to be a source of easy super profits and a 'haven' for the shrinking construction sector in Greece (Metaforespress.gr, 2020). In total, Egnatia Highway manages the operation and maintenance of an extensive motorway network.
- **Contracts of operation and maintenance are subcontracted and discounted.**
Contracts of operation and maintenance subcontracted by Egnatia Odos created an average **discount** of the tender budget by 55% at least, saving a lot of income that becomes profit for Egnatia Highway. Thereby putting in this way into question the proper infrastructure maintenance standards.

4. FUTURE RESEARCH DIRECTIONS

Some lessons can be learned from the experiences with Public-Private Partnership (PPP) contracts by analyzing the cases of different developing or developed countries. As we analyzed above, PPP contracts have different advantages and disadvantages. An important precaution that should be taken into consideration before signing PPP contracts is the assessment of the financial capabilities of the private partners, a full understanding of the project's risks, and ensuring that the selected model matches the project's goals. From the beginning, the objectives of the project and the expected results should be defined as clearly as possible. A well-defined scope helps create PPP contracts with clear performance indicators, thus reducing the risk of misunderstandings and later disputes. Another important element is the efficient distribution of risk. Governments must carefully assess and allocate risks to the party that has the most ability to manage them. The clearer the risk-sharing mechanisms are, the more potential conflicts are avoided and the sustainability of the project is ensured. Contractual agreements must be transparent. In PPP contracts, it should be articulated as clearly as possible what are the roles, responsibilities, and obligations of each contractual party. The implementation of transparent contracts would facilitate understanding, effective cooperation, and accountability. The engagement of interested parties, such as local communities and relevant authorities, in the early stages of project development would contribute to the successful execution of PPP contracts. This is because stakeholder engagement helps address concerns, gather valuable knowledge, and build support for the project. Drafting contracts with flexibility to adapt to changing circumstances is also an important element. As economic, political, or environmental factors may evolve, contracts must have mechanisms to accommodate such changes without compromising the integrity of the project. Governments must have the expertise to monitor and enforce compliance with contractual terms and conditions. Future research will be focused on the link between PPP project developments and economic growth. So, future studies may contain different analyses about this linkage.

5. CONCLUSION

It is important to implement robust performance monitoring and evaluation systems as regular evaluations ensure that the private partner meets agreed standards and allow for timely intervention if problems arise. PPPs are often several long-term commitments. As a consequence, it is important that governments carefully evaluate their long-term plans, ensuring that projects are aligned with broader development goals and that commitments remain viable throughout the project's life cycle. PPP projects need cooperation and coordination between the private and public sectors. Success in PPPs is contingent on certain arrangements: (i) clear and stable market rules; (ii) sound and predictable legal and regulatory environments; and (iii) well-designed projects, including appropriate risk allocation. Public-private partnerships (PPPs), if implemented well, can help overcome inadequate infrastructure that constrains economic growth, particularly in developing countries PPP is an instrument. The elements that agree within it, can make this instrument harmful or beneficial for the community.

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Simplified Limited Liability Company

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Abstract: *Of all forms of trade companies, the limited liability company is the most common, both domestically and in the rest of the world. Such “popularity” stems from several factors, which are important for “young” entrepreneurs and individuals who lack the capital to establish another form of trade company. Those factors, or circumstances, are the relatively low minimum basic capital, the limited liability of the founders and shareholders in terms of the responsibilities and obligations the company has towards third parties, the relatively simple establishment process, as well as the simple organizational structure of the company. With the Amending Law of the Law on Trade Companies, published in the Official Gazette of North Macedonia no. 215/2021 of 16.09.2021, the legislator incorporates a so-called “sub-form” of the LLC – the Simplified Limited Liability Company (in continuation: SLLC). With this incorporation, the legislator intends to give additional relief to founders by minimizing the minimum basic capital from at least 5.000 EUR to at least 1 EUR expressed in denar counter value calculated according to the average exchange rate which is published by the National Bank of the Republic of North Macedonia.*

1. BASIC CAPITAL

In legal and economic literature, the basic capital of the company is defined as a “guarantee capital” which protects creditors and somewhat compensates the fact that shareholders are not responsible for the obligations of the company.

The basic capital is an accounting category that assumes a part of the passive income of the company and eliminates shareholder liability. The company’s liability is covered by the assets in its active income, including all payments based on accruing the amount of the basic capital. Concerning the aforementioned, nothing can change the circumstance that the company is obliged to use its property in a manner by which it will always do so with assets that correspond to the amount of basic capital. Due to the nature of the obligation, it should be noted that there is a difference between the basic capital and the property used by the company in relation to its creditors.

The company’s property is its active income. The value of the active income is not constant and changes over time, which is why the basic capital does not follow this trend; there is no obligation to change its value once the value of the active income changes. In this context, instead of the basic capital determined by the operating agreement, the company’s property is important for the settlement of liabilities.

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Additionally, the theoretical concepts present in studies of corporate law determine the basic capital and its value as an essential element of the existence of the trading company as a whole, inasmuch they form a guarantee for creditors which establish business relationships with the company, have been overcome.

1.1. The Basic Capital and the Limited Liability Company

The Limited Liability Company is a trading company in which one or more natural persons and/or legal entities participate with one share (basic contribution) in the pre-determined basic capital of the company (“Official Gazette of the Republic of Macedonia” no. 28/2004 ... “Official Gazette of the Republic of North Macedonia” no. 99/2022).

The shareholders place their investments (which can be monetary and non-monetary) in the company. When the shareholders place a non-monetary investment in an LLC, they actually place property (which can be movable and immovable) and rights (such as personal servitude, property servitude, real burden, right to build, concession and other rights). In this respect, the founders of a LLC place an investment with an estimated value acceptable for the company, i.e. a value which may and often does, differ from the real market value of the movable and/or immovable property and/or right which constitute the investment. The aforementioned is highlighted to confirm the stance that anytime when a “guarantee” is mentioned for the fulfillment of company obligations, it is in reality the property (active income) of the company, not the basic capital.

The basic capital of an LLC cannot be less than 5.000 EUR expressed in denar counter value and is comprised of the separate contributions of each shareholder. The individual contribution of the founder/shareholder cannot be less than 100 EUR expressed in denar counter value. The maximum number of founders/shareholders is limited to fifty.

LLCs are managed by one or more managers, without limitations to the maximum number of managers allowed. In practice, it is more common that an LLC is managed by one manager with unlimited powers in the internal and external turnover or two managers with a bound signature. Alongside managers, according to the Law on Trade Companies, an agent may undertake activities in the name and on behalf of the LLC, with respect to the powers vested in them through the agency agreement.

1.2. The Basic Capital and the Simplified Limited Liability Company

The Simplified Limited Liability Company is a trade company in which three natural persons at most, can participate with one share each (basic contribution) in the pre-determined basic capital of the company.

The smallest value of the basic capital of the SLLC is 1 EUR expressed in denar counter value, with the smallest nominal value of each share being 10 cents in denar counter value according to the average exchange rate which is published by the National Bank of the Republic of North Macedonia on the day of payment.

According to Article 172-a, paragraph 5 of the Law on Trade Companies, if an SLLC increases its basic capital, in a manner by which it reaches or surpasses the smallest amount of basic capital of an LLC, the provisions that are intended for the SLLC ceases to apply, which in

conclusion signifies that the maximum amount of basic capital for the SLLC is 4.999,99 EUR in denar counter value. This article regulates the “conversion” from an SLLC to an LLC, excluding the obligation to change the business name.

Differing from the LLC, the contributions that founders place in an SLLC can only be monetary.

The SLLC is managed by only one manager, a founding member or shareholder of the company. This limitation is understandable having in mind the type of company, in other words, it cannot be expected from a trading company which can be established with a basic capital of 1 EUR to separate finances that would cover the income of more than one manager. It is, however, worth mentioning that the Law on Trade Companies does not prohibit an SLLC from hiring an agent who may undertake activities, which would signify that apart from the manager, an SLLC may have another person who will decide in the name and on behalf of the company.

An interesting trait of an SLLC is the obligation to keep a mandatory reserve, which is comprised of one-fourth of the company turnover as determined in the annual financial reports, deduced by the amount of loss calculated for the previous year (“Official Gazette of the Republic of Macedonia” no. 28/2004 ... “Official Gazette of the Republic of North Macedonia” no. 99/2022).

2. INTRODUCTION OF THE SLLC

On 16.09.2021 the Amending Law (“Official Gazette of the Republic of North Macedonia” no. 215/21) of the Law on Trade Companies (“Official Gazette of the Republic of Macedonia” no. 28/2004 ... “Official Gazette of the Republic of North Macedonia” no. 99/2022) was published, according to which, a new form of limited liability company was introduced, also known as the simplified limited liability company or SLLC.

Without a doubt, it seems as though one of the main reasons for the incorporation of this sub-form of the limited liability company within the Law on Trade Companies is offering the possibility to lessen the burden of establishing a business for those who have fruitful business ideas and entrepreneurial spirit, however, lack the initial capital to do so. The removal, or rather, shift of the basic capital requirement of no less than 5.000 EUR, to the basic capital requirement of 1 EUR is in fact, a distinguishing and essential feature of this form of company. It is legitimate to pose the question of establishing a business with no capital basis, however, that remains a topic that will not form a part of the subject matter in this thesis.

The dilemma which we aim to touch upon is the extent to which it was necessary to incorporate a new, sub-form of the LLC in comparison to amending the law to deduce the basic capital from 5.000 EUR in denar counter value to 1 EUR in denar counter value. The reasoning behind this dilemma is the mere fact that at this moment, within the Macedonian legal framework, there are practically two types of limited liability companies. The incorporation of the simplified limited liability company at a glance sets this form of trade company in a “subordinate” position in contrast to the “classic” limited liability company.

In strengthening the previous stance, it is worthy to emphasize that the legislator has conceptualized the amendments with the idea to “transform” the once-established SLLC into an LLC, alluding that this form of company is somewhat temporary—existent until it transforms into a limited liability company.

3. STRENGTHS AND WEAKNESSES OF THE SIMPLIFIED LIMITED LIABILITY COMPANY

The popularity and rapid spread of SLLCs are a result of their primary features – the simplification of the organizational structure and the minimized amount of basic capital. A SLLC fulfills the obligation to establish a formal managerial structure if it appoints one person as the managing director. All other managerial functions and organizational hierarchy stem from the will of the shareholders, i.e., if they agree upon the need for sectoral changes or special appointments.

In terms of basic capital, the most accentuated characteristic is the opportunity to establish an SLLC with a basic capital of only 1 euro. However, in almost all SLLCs, regardless of the country in question, the law sets an obligation to separate, in most cases, 25% of the annual profit and “store” it in the company’s reserve funds. In other words, the shareholders of an LLC, every year, have to operate with a profit deduced by the amount they have to store in their reserve funds. The reason for such an obligation is to ensure these companies can eventually transform the SLLC into a regular limited liability company, for which a much higher amount of basic capital is necessary. An additional positive trait in establishing an SLLC is the lack of formalities and complicated bureaucratic procedures in the registration process.

Lastly, maybe one of the more pronounced positive characteristics of any limited liability company is exactly that – the limitations on the liability of the shareholders to their contributions to the basic capital.

4. COMPARATIVE ANALYSIS

Although a novelty in Macedonian law, the SLLC existed in Europe, decades before. It is truly difficult to determine where this form of trade company emerged for the first time, however, simplified limited liability companies are not unknown to the European trade practices.

Within the region, the first country which has incorporated SLLCs in its domestic legal framework is Croatia. This opened an opportunity for Croatia, as a member state of the European Union, to become more suitable for foreign investment and offer the possibility to establish subsidiaries on its territory, and *vice versa*, a fruitful alternative for its citizens to establish an SLLC in Croatia, and then transfer their business venture in any other member state of the EU.

For the purpose of the comparative analysis of the SLLC across various jurisdictions, below are examples from Germany, Luxembourg and Croatia.

4.1. The SLLC in Germany

The simplified limited liability company appeared for the first time in Germany in 2008 assuming the title *Unternehmergeellschaft*, UG or mini-GmbH (in continuation: mini-GmbH). The mini-GmbH can be established with a basic capital of 1 EUR, having in mind that the maximum amount of basic capital should be no more than 25.000 EUR because upon reaching such amount, there is a legal obligation to transform and register the company as a limited liability company or GmbH. One distinct feature of the mini-GmbH is the reserve fund of the company,

comprising 25% of the annual turnover, which in turn could be beneficial in reaching the required amount for the transformation into a GmbH. This is a significant opportunity for the growth and development of small businesses, as well as considerable encouragement for foreign investors to establish their business in Germany, and afterward expand across Europe. The separation of 25% of the annual turnover presents a form of compensation for the minimal basic capital, while upon reaching 25.000 EUR, the company can easily transform into a regular GmbH and be adequately registered in the German company registry. The mini-GmbH has legal status and is liable for its entire property. It eliminates the personal liability of its shareholders, excluding circumstances when they are liable to the company.

4.2. The SLLC in Luxembourg

Under Deputies Bill 6777 amending the Law on Commercial Companies and the Law on Trade and Companies Register of Luxembourg ([Official Newspaper of the Grand Duchy of Luxembourg](#)), on 23 July 2016, a new form of trade company was introduced, already highlighted as the simplified limited liability company, or the *Société à responsabilité limitée simplifiée* – SARL-S. Under the slogan, “one euro, one person, one day”, this form of trade company gains popularity quickly because of the simplicity in every aspect of importance for its establishment.

The SARL-S can be founded only by natural persons. It is important to note that a shareholder in a particular SARL-S may be a shareholder in a different type of trade company if that company is not a SARL-S.

There are also limitations on the maximum number of shareholders. Namely, a particular SARL-S may have at least one shareholder, and at most, 100.

As was the case in Germany, one of the more significant features of the SARL-S is the fact that it outmaneuvers complicated bureaucratic procedures in the phase of establishment. By obtaining the necessary business license from the Ministry of Finance, the shareholders sign the founding agreement and can without further ado register the company in the Trade Registry, without having to contract a notary or an attorney at law.

Additionally, by the same token as in Germany, the only obligation in terms of the organizational structure of the company is the appointment of a single person as the managing director. The managing director represents the company in business endeavors with third parties, in order to fulfill the goals and objectives of the same. The managing director is appointed by the shareholders.

Unlike in Germany and Croatia, the Luxembourg Law on Trade Companies presupposes a removal of only 5% of the annual turnover which would then be stored in the reserve fund, so the company can eventually accumulate enough finances to transform into a limited liability company. It is worth mentioning that the SARL-S companies are obliged to contract an auditor if one of the following three circumstances occur: if the company has more than 50 employees if the total balance sheet surpasses 4 million euros or if the net turnover (excluding taxes) surpasses more than 8 million euros ([Simplified Limited Liability Company \(SARL-S\), n.d.](#)).

Without a doubt, corresponding to the trend in Germany, the SARL-S is continually becoming the most popular business venture among entrepreneurs.

4.3. The SLLC in Croatia

In Croatia, the simplified LLC is called *jednostavno društvo s ograničenom odgovornošću (j.d.o.o.)*. It first emerged in 2012 as a branch of the limited liability company. It is considered a branch because besides the amount of basic capital and some additional minor differences, all of the legal norms that apply to the limited liability company, also apply to J.D.O.O. During that time (2012), Croatia was on the brink of becoming a member-state of the EU, and as such, there was a requirement to harmonize the domestic with the European legislation. In relation to trade practices, this would signify providing a legal basis that offers all legal persons who have a registered entity in other member-states of the EU, to be able to expand and open a subsidiary in Croatia.

Such an obligation, alongside the effort to minimize the number of unregistered entities, presented an incentive for the Croatian legislators to introduce a form of entity they were primarily against. Namely, in Croatia, it was determined that this form of trade company was unnecessary because limited liability companies already existed. In furthering this argument, LLCs in Croatia could be established with a far lesser amount of basic capital in comparison to other countries in Europe. In a similar way to the other countries that have been analyzed, J.D.O.O. experiences rapid growth in Croatia. Its popularity derives from the aforementioned positive features, directly contributing towards the rise in the number of registered J.D.O.O.s, which surpasses the number of registered limited liability companies, taking into consideration that this form of company does not retrospectively exist as much as the limited liability company. One J.D.O.O. can be established by any natural or legal person, however, as in Germany, the number of shareholders is limited to three. It should be considered that one limited liability company cannot lower its basic capital to transform into a J.D.O.O., while the contrary is possible and even encouraged. Namely, each J.D.O.O., as was the case with the mini-GmbH in Germany, is required to separate 25% of its annual turnover. It can transform and register with the Trade Registry as a regular limited liability company once it reaches the necessary minimal basic capital threshold of 20.000 Croatian Kuni. However, reaching this threshold is not sufficient for transforming a simplified limited liability company into an LLC. At the moment when a particular J.D.O.O. reaches an amount of 20.000 HRK in its reserve fund, it does not stop being a J.D.O.O., rather it stops being regulated by the provisions specific to J.D.O.O. companies.

The registration procedure begins with submitting all necessary documents to a notary, where all shareholders must sign the documents in person, and the notary to verify them. The documents necessary for registering a J.D.O.O. in Croatia include a statement for the establishment of the company, an agreement for the establishment of the company, subject of business activity and basic capital, a number of shares, a decision appointing a managing director, a list of shareholders, etc. The documents are then submitted to the Commercial Court and the company is registered in the Trade Registry under the State Statistical Office. The shareholders need to register in the system for pension and health insurance, as well as the tax authority. As in all other countries, a J.D.O.O. is allowed to have one managing director, in which case the legal obligation for a specific organizational structure is fulfilled.

5. CONCLUSION

From a current point of view, within the Macedonian law on trade companies exist two forms of limited liability companies which rest upon the same principles and concepts deriving from the contemporary law on trade companies.

Based on the comparative analysis of the law in Germany, Luxembourg and Croatia, one can deduce that generally, with minor deviations, the legal solutions for this form of trade company are identical to those implemented by the Amending Law of the Law on Trade Companies, published in the Official Gazette of the Republic of North Macedonia, no. 215/2021 on 16.09.2021.

Concerning the deviations mentioned above, unlike in Croatia, the Law on Trade Companies of the Republic of North Macedonia does not expressly prohibit the transformation of a limited liability company into a simplified limited liability company. The Macedonian law additionally does not limit the number of simplified limited liability companies where one person can be a shareholder, as was the case in Luxembourg, where one person can only be a shareholder in one simplified limited liability company.

As it was mentioned previously, the dilemma that we aim to touch upon is the extent to which it was necessary to incorporate a new, sub-form of the LLC in comparison to amending the law to deduce the basic capital from 5.000 EUR in denar counter value to 1 EUR in denar counter value.

Having in mind the aforementioned facts and arguments, which focus on the significance of basic capital as a guarantee for fulfilling obligations, the authors consider that a more adequate amendment in the Law on Trade Companies would be the provision by which the basic capital of an LLC (D.O.O.) would be deduced to 1 EUR in denar counter value, instead of introducing a new form of limited liability company. Certainly, the incorporation of the SLLC or P.D.O.O. in the Macedonian legal framework will significantly contribute towards the growth and development of entrepreneurship; a possibility for the establishment of a large number of small businesses which have previously been restricted because of financial burden. However, the authors maintain that this particular feature sets the simplified limited liability company in a “subordinate” position in comparison to the “regular” limited liability company. This stance stems from the circumstance that having a basic capital of 5.000 EUR *versus* a basic capital of 1 EUR, in the real operations of the company, does not present a discrepancy that guarantees the business ventures of a LLC (D.O.O.) would be more successful of those in SLLC (P.D.O.O.), nor a difference presenting a guarantee for the fulfillment of obligations of the company. Thence the conclusion that the prefix “simplified” puts the simplified limited liability company in a “subordinate” position to the LLC.

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Challenges to Legal Education in the Modern Digital World

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Abstract: *In recent years, there have been different approaches to legal education in Law Faculties. All of them aim at better and quality assimilation of the taught matter by the students. Given the rapid pace of digitalization in all spheres of public life, the issue of the application of new technologies and the place of artificial intelligence in legal education is of particular importance. By analyzing the positive and negative sides of artificial intelligence, the authors focus on innovative approaches in the process of teaching and training in „Law“. The advantages of new information technologies and applications are of particular importance. In conclusion, recommendations are outlined, including the introduction of a discipline „Law and Artificial Intelligence“ to increase students' knowledge in the field of artificial intelligence and its functions.*

1. INTRODUCTION

In recent years, there have been different approaches to legal education in Law Faculties. All of them aim at better and quality assimilation of the taught matter by the students. Given the rapid pace of digitalization in all spheres of public life, the issue of the application of new technologies and the place of artificial intelligence (AI) in legal education is of particular importance.

2. THEORETICAL, PRACTICAL AND MORAL ASPECTS OF LEGAL EDUCATION

The classical form of legal education is related to the teaching and assimilation of a large volume of legal texts, the creation of logical links between different legal institutes, the systematization and analysis of facts, and the slender argumentation of a legal thesis. Increasingly, theoretical knowledge is combined with the development of practical skills using the „Case study“ method³, classes in legal debates and simulated judicial trials. The theoretical and practical aspects of legal education are traditional for training in all legal disciplines. In essence, however, law as a social regulator also includes many moral and ethical issues. They are reflected in legal science and training in legal disciplines. The concept of justice in law is fundamental both for the legal profession and for education in the specialty of „Law“. The teaching of legal disciplines sets the legal rules of conduct based on the social role of law and its value nature. This shows the moral aspect of legal education and the important role of the human factor in its effectiveness.

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³ This method is included in legal education for the first time at Harvard University ([Harvard Law School, n.d.](#)).

3. LEGAL EDUCATION IN THE CONTEXT OF INFORMATION TECHNOLOGY DEVELOPMENT

The rapid development of technology and its penetration into the legal sphere allows us to talk about the so-called virtual aspect of legal education. The digitization and transfer of law education have accelerated especially with the COVID-19 pandemic, with classical teaching methods not excluded but skillfully combined with audio-visualizing tools, specialized software, legal information systems, electronic libraries and other databases. These new funds have contributed to facilitating the search and finding of information, academic and scientific literature, and case law by law students. The modern digital world has been moved into a new stage with the advent of artificial intelligence. The young student audience uses AI and its advantages not only to search for information but also to solve specific learning tasks – preparation of coursework, projects, opinions, and case studies.

In response to the new reality, artificial intelligence was introduced as a new specialty in Bulgarian university education⁴, but questions related to its capabilities are still not a subject to study by Bulgarian students in the specialty „Law“. While in many foreign Law faculties artificial intelligence is widely used in the educational process (Fornasier, 2021), the Law community in Bulgaria is still skeptical of this technology.

The main issue in this article is if such training is necessary and what it would contribute to increasing the legal competence of students. This question requires an analysis of the possible challenges and advantages of artificial intelligence in legal education.

4. CHALLENGES OF ARTIFICIAL INTELLIGENCE IN LEGAL EDUCATION

The first major challenge to the training in the specialty „Law“ is the lack of a clear idea of the possible areas of application of artificial intelligence and the limitations in its use. This is what has led to a polarization of opinions on the role of artificial intelligence in different spheres of professional life. Publications have appeared in the media expressing skepticism and concern for security, professional realization and human rights (Dervanović, 2018). On the other hand, many sources point to the advantages of artificial intelligence and its possible advantages in every area of human knowledge (Valchev et al., 2023). The problems of artificial intelligence have been identified as a priority for the EU and have found a place in the legal framework of AI by European institutions (European Commission, n.d.-a). The lack of a clear legal framework for the use of AI indicates the need for interdisciplinary research before it can be introduced into training. This step has already been taken (Cabral, 2018; European Commission, n.d.-b). Research shows three main groups of risks for legal education:

4.1. Seeking and Using Correct Legal Information

Modern society is subject to unlimited access to information. This is not only an advantage but also carries many risks of using unreliable and dubious training materials. The conceptual question of human knowledge and its limits is also raised. The aspiration to acquire new knowledge is shifted from the idea of its accessibility. There is a transformation from learners to direct

⁴ For example, Technical University, Sofia provides specialty „Intelligence systems and AI“ (Technical University, Sofia, n.d.); UNWE provides a Master program „Artificial Intelligence and Big Data“ (University of National and World Economy (UNWE), n.d.)

„consumers of taken decisions“. These risks are heightened by possible weaknesses in AI design and by the data it uses – for example, information based on social prejudices and stereotypes can lead to the offer of intolerant and discriminatory patterns of behavior⁵. This puts at risk the theoretical aspect of legal education.

4.2. Construction of Argumentation and Solutions of Legal Cases

AI provides a „solution“ to any legal situation, and at first glance, this seems quite attractive. But these possibilities of technology can significantly threaten the quality of education, as they lead to a decrease in the abilities for critical thinking, analysis and synthesis of relevant information. This concerns the practical aspect of legal education. In the longer term, the use of databases and algorithms to solve specific tasks raises the question of liability in case of judicial mistakes or causing damage (European Union, n.d.).

4.3. Distancing and Apathy Towards Specific Moral Dilemmas

Extensive use of AI in law courses could lead to blunting sensitivity to human rights and justice in law, which calls into question the importance of the human factor in legal education. The idea that a man will be replaced by a „machine“ in solving significant issues such as legal classification, determination of punishment, appeal of the sentence poses a risk of depreciation of legal education and underestimation of motivation for absorption of new knowledge. This shows the leading role of the law teacher. AI cannot motivate and set a personal example. It has no personal morality and is not subordinated to social values. Despite the onset of digitalization, it is devoid of cultural and institutional context. AI has no personal opinion and cannot defend a personal position. AI cannot make independent decisions and take responsibility for gaps in the learning process. An AI can be neither a learner nor a trainer.

These risks to legal education are combined with many advantages of AI that should not be ignored. The main question we should ask ourselves is how to turn challenges into advantages. This is necessary because AI is part of modern digital life.

5. ADVANTAGES OF ARTIFICIAL INTELLIGENCE IN LEGAL EDUCATION

Council of Europe Secretary General Marija Pejčinović Burić said: „AI is already with us – changing the information we receive, the choices we make and the ways our societies function. In the coming years, it will play an even greater role in the way governments and public institutions function, as well as in the way citizens interact and participate in the democratic process.“ (Council of Europe, 2023) These words eloquently show that modern education cannot stay away from the development of innovations with Artificial Intelligence. But first of all, in order to fully exploit all the positive aspects of AI, one must know its essence and potential (DiMatteo et al., n.d.). The way an AI technology works is essential for its full application. Above all, lawyers and law professors must be well-versed in the algorithms of the respective machines (Raja et al., 2021). Only the combination of Artificial Intelligence and human skills and factors are conditions for quality legal education. Realizing this need, many universities abroad now offer independent disciplines and courses in artificial intelligence⁶.

⁵ These risks are discussed at European Parliament (n.d.).

⁶ University of Oxford, University of Harvard, Udemy academy and etc.

As far as we talk about a process of education in legal disciplines, the authors believe that in law teaching classical methods should be preserved and combined with artificial intelligence as a new method. The goal is to make AI a valuable assistant in the work of law students and university professors (Sharma, n.d.).

5.1. Rapid Processing of Information

The created algorithms save a lot of time, which is the most valuable resource in modern times. In this way, law professors can become much more effective in the teaching process, while students easily absorb new legal knowledge (Sharma, n.d.). On the one hand, thanks to new technologies, the latest changes in the regulatory framework can be traced quickly. On the other hand, by using and processing huge databases in a short time interval, in this way, AI provides information for comparative legal research.

5.2. Enhancing Students' Practical Skills

AI would be particularly useful when conducting seminars in legal disciplines, as it can be used to produce various legal documents, statements, contracts, case studies, etc. In addition, AI can visualize a model (model) of a legal document that serves as a basis for legal analysis. This approach aims to stop students from using directly created (ready-made) materials to replace their active participation in the learning process (Patel & Gandhi, 2023). Various writing assistants (ChatGPT) can monitor the good language and meaningful preparation of legal documents, compliance with all their requisites provided for by law. This would lead to building skills in students for their proper preparation. The development of applications to help users of legal Services through Artificial Intelligence is also of great importance for enhancing students' practical and applied skills (Choi et al., 2023).

5.3. Role Play Assistant and Procedural Action Preview

Through virtual training with the help of artificial intelligence, investigative actions (interrogation, inspection of an accident, search, seizure, investigative experiment) or other procedural actions can be recreated (Rehnström, 2021). In this way, law students become „virtual participants“ in their implementation.

5.4. Monitoring of the Learning Process

Among the advantages of AI is that it is not static, but is constantly evolving (learning). In individual cases, it can be applied to update traditional legal courses, taking into account the change in legislation and case law. AI allows the preparation and verification of test tasks and case studies. In the learning process, it can give indicative „feedback“ to the degree of learning material absorbed by placing predictive assessments.

6. FUTURE RESEARCH DIRECTIONS

A large number of AI critics advocate the notion that law professors aim to teach law students three main skills: 1) critical thinking ability; 2) the ability to solve a specific problem by giving different creative solutions; 3) empathy for a problem and the formation of a civil position or, to put it another way, simply „empathy“ (Connel & Plack, 2019). For centuries,

these traditional goals of education have been achieved through classical teaching methods. The analysis of the risks and advantages of AI shows that its use does not threaten the human factor in law education. What's more, when used as a tool not as a participant in the learning process, AI can successfully complement and refine classical educational approaches. This conclusion necessitates the need for in-depth knowledge of how Artificial Intelligence works and within what limits it can be used in legal education. The use of AI resources should be tailored to the specifics of the relevant taught matter and the presence of moral and ethical dilemmas in it. For example, in tax law, in proceedings for registration of legal entities, commercial law, etc. It has a wider scope than in criminal justice, where the person cannot be substituted. In criminal law science, where justice is a fundamental human value, it is unacceptable for decisions to be made by machines.

AI will lead to the overcoming of more dogmatic and outdated teaching methods, with an emphasis on generally available information and recreation of facts, and will focus on creating and building skills for formulating questions, and analyzing different perspectives.

7. CONCLUSION

In conclusion, AI leads to a new type of social relations, which need regulation. In the field of legal education, it is appropriate to introduce a new discipline „Law and Artificial Intelligence“, which aims to create skills for the proper use of AI in different legal areas in a differentiated approach, respect for human rights and ethical norms of behavior. However, we believe that AI should be used in the specialty of “Law” depending on the specifics of the respective legal field, taking into account the role of human factors in the process of education.

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DSA & DMA – The Role of Dual Regulation

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Abstract: *The evolution of digital instruments completely changed the European perspective on legislation, resulting in a shifted perception of the e-Commerce Directive, considered insufficient to tackle and further protect digital markets and to provide a level playing field for the platform economy.*

Systematic approaches for regulating digital markets began shaping EU strategy, 2024 marks the year when full enforcement of a set designed to cover challenges of digital markets or, more specifically, digital platforms is expected. The dual role of DSA and DMA and the interplay between these and other European texts that are already in force are addressed in the article.

1. INTRODUCTION

The history of more than twenty years of EU is intertwined with the evolution of e-commerce and the development of digital services, through digital platforms that have contributed significantly to the widening range of goods and services available in the internal market (**Communication from the Commission to the European Parliament, The Council, The Economic and Social Committee and the Committee of the Regions (Single Market Act)**).

Indeed, the EU itself has placed e-commerce among the priorities for the development of the internal market. Economic data² on the activity of e-commerce and digital platforms suggests strongly that the future of the EU economy will continue to be tied to digitally facilitated business interactions.

In terms of legislation, it can be argued that part of the EU's policy framework encouraged the progress of the digital economy overall, where the European cornerstone is the E-commerce Directive. Understanding the legislative context, from the introduction of the E-commerce Directive, followed by the Platform-to-business Regulation (P2B Regulation) and up to the adoption of the DSA & DMA package is relevant to underlining European legislators' direction in leveling the field between digital platforms and all other participants in the platform economy, be it consumers, business users of their services (**Regulation (EU) 2019/1150 of the European Parliament and of the Council on promoting fairness and transparency for business users of online intermediation services (P2B Regulation) definition, art.2**) or even authorities and platforms interacting in various procedures laid down in the EU texts or even reducing/even simplifying disputes.

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² i.e. B2C e-commerce turnover in 2023 in 37 countries in Europe was 975bln €, according to European E-commerce Report, issued by **Ecommerce Europe (2023)**, an association representing digital commerce sector.

2. EU REGULATORY CONTEXT ON INTERMEDIATION SERVICES

2.1. E-Commerce Directive

For substantive reasons, the references to E-commerce Directive provisions will be limited to the relevant articles of the DSA Regulation, i.e. Articles 12-14, which lay down conditioned limited liability of information society services for content transmitted or hosted, and Article 15, which establishes the absence of a general obligation to monitor transmitted or hosted information, as well as the absence of an obligation to actively seek facts or circumstances through which illicit activities may be revealed.

As is already widely known, notably through European case law³, the limitation of the liability of online intermediaries for content hosted or transmitted represented the foundation on which online intermediaries developed within the European area, in conjunction with the prohibition of a general obligation to monitor the content posted/transmitted online, the first Directive's impact assessment report ([First Report on the application of Directive 2000/31/EC of the European Parliament and of the Council of 8 June 2000 on certain legal aspects of information society services, in particular electronic commerce, in the Internal Market \(Directive on electronic commerce\)](#)) noted the impossibility of checking millions of web pages/websites, accepting that such a measure would be disproportionate in terms of costs for end-users (consumers) or business users of intermediation services (as mentioned above).

Remarkably, this argument was made in early 2000, at a time when the same report states that internet penetration in EU households is around 43%⁴, with e-commerce at around a negligible 1-2% of retail while online marketplaces are mentioned as being at the beginning ([First Report on the application of Directive 2000/31/EC of the European Parliament and of the Council of 8 June 2000 on certain legal aspects of information society services, in particular electronic commerce, in the Internal Market \(Directive on electronic commerce\)](#), p. 8). Similarly, it also mentions that it is premature to determine the impact of these provisions, but points out that, in terms of limited liability of information society services, a reduction in the number of cases before courts is a positive step towards establishing a stable environment for the growth of these services.

Outlining some of the contexts under which the E-commerce Directive was adopted, as well as its potential outcomes, are closely associated with the choice of dual regulation at the EU level: firstly, in terms of impact on online intermediaries' service growth, subsequent economic studies have shown the contribution of limited liability of online intermediaries ([Copenhagen Economics, 2015, p. 5](#)) to EU-wide economic growth and intermediaries' role in innovation within EU⁵, by passing on benefits and enabling technologies for small and medium sized enterprises through their digitalization, as well as through benefits transferred to consumers - reduced prices and improved transparency or even the possibility for the latter to engage in business transactions as professionals ([Copenhagen Economics, 2015, p. 32](#)).

³ i.e. C-567/18, CJEU.

⁴ Compared to 92% population accessing the internet in 2023, according European E-commerce Report, issued by [Ecommerce Europe \(2023\)](#).

⁵ Historical data highlights that in just a 2-year period, online intermediaries' growth in the EU has been double-digit Copenhagen Economics report. However, growth of online intermediaries originating in the EU has been more than 50% over a period of 3 years ([Copenhagen Economics, 2015, pp. 3 – 10](#)).

The designation of e-commerce as one of the key pillars contributing to a Digital Single Market, on the other hand, leads European lawmakers to consider some of the constraints of the E-Commerce Directive and to initiate several actions contributing to increasing confidence and trust in online instruments, with services of online intermediaries included. Both because it is not the scope of this article but also because it could be entirely covered in another article, it will be sufficient to mention that among the actions taken was increasing consumer protection levels (Directive (EU) 2019/2161 of the European Parliament and of the Council of 27 November 2019 amending Council Directive 93/13/EEC and Directives 98/6/EC, 2005/29/EC and 2011/83/EU of the European Parliament and of the Council as regards the better enforcement and modernisation of Union consumer protection rules (Omnibus Directive)) and identifying mechanisms to tackle illegal online content, using services provided by online intermediaries.

2.2. Platform to Business Regulation

If at the time of the first assessment regarding the impact of the E-commerce Directive, the activity of online intermediaries was in its early stages, centered around e-commerce, the status quo looked quite different at the time of the proposal and adoption of P2B Regulation.

European citizens understood not only what e-commerce means, but also how varied the activity of economic operators in the online environment can be, the common element being that they fall into the typology of multi-sided platforms⁶, even if their activity falls into e-commerce, social media, search engines, comparators or even in the collaborative economy. As European economies benefited economically because of digital economy progress, Member States and the European Commission were dealing with competition investigations involving online actors⁷, each of them revealing the complexities of business models that challenged an existing competition enforcement paradigm (Graef & Costa-Cabral, 2020).

The adoption of P2B Regulation, however, was not intended to supplement or update competition rules or those in the e-commerce sphere, but to regulate one of the facets of an online intermediary, namely the B2B relationship.

P2B Regulation represented an important moment in identifying a new direction for the European regulator since it is a regulation which, on the one hand, establishes new legal concepts - such as transparency and fairness - and, on the other hand, sets out a number of contractual requirements (in terms of obligations to provide information, contractual terms and remedies) that online intermediaries have to comply with in their contractual relationship with professional users of services.

Concerning transparency and information obligations, it is noteworthy that in the same year of the adoption of the P2B Regulation, the new consumer protection package was also adopted, where approximately similar obligations were laid down for digital marketplaces to inform consumers about the content shown and ranking results.

Expressly stating that its purpose is to help balance the contractual relationship between an online intermediary (provider of intermediation services, as defined in the Regulation) and the professional user of the services made available by the former, the provisions of the European text

⁶ For understanding multi-sided platforms, see Evans and Schmalensee (2016).

⁷ i.e. Commission's investigations involving platforms (European Commission, n.d.-a).

imposed at that time a number of pioneering obligations for the digital sector, such as providing information on the criteria for ranking products or services on the platform, the obligation to provide easy-to-understand terms and conditions, and the obligation to provide information on differentiated treatment or platform advertising, all of which had the declared scope of contributing⁸ to a predictable and fair regulatory climate for users of intermediary online services, given that many of those users of these services corresponded to small and medium-sized enterprises.

Analyzing the sum of obligations imposed for online intermediaries and correlating them with similar obligations identified in specific consumer protection laws ([Omnibus Directive, art. 6a](#)), it appears that at the time of the adoption of the P2B Regulation, the European lawmakers extrapolated notions such as absence of proper information or vulnerability of consumers to the economic activity of the professional user and the platform.

Whereas the scope of P2B Regulation might be described as in line with B2B commercial relations, given the intervention of enforcement authorities to address specific market behaviors, the Commission's recently published report on the implementation of the Regulation is relevant to assess to what extent the instrument chosen by the European lawmaker was adequate.

The report emphasizes throughout its content that provisions laid down are of significance and need to be implemented, by transposing the obligations of online intermediaries into contractual private law, leading to increased transparency and predictability in online markets ([REPORT FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS on the first preliminary review on the implementation of Regulation \(EU\) 2019/1150 on promoting fairness and transparency for business users of online intermediation services, pp. 1-4.](#)). Yet precisely the first page of the report mentions three key ideas likely to cast doubt on the effectiveness and success of the intended purpose, namely the absence of compliance, complementary to other European texts and a lack of sufficient awareness amongst the beneficiaries of the provisions themselves.

Even though this report states data was collected from 300 platforms (information on the total number of platforms that would be covered by the scope of the Regulation is not provided, so it is rather uncertain to what extent results are representative), it points out that intermediation service providers failed to comply with legal requirements, and that there are discrepancies in interpreting them, examples being linked to number of complaints reported by several platforms, length required to settle them, and the success rate for businesses using intermediation services.

In spite of the fact that this report was finalized after the adoption and even the entry into force of the two regulations - DSA & DMA - and although it does not fall within the scope of competition law, it can be presumed that the lack of enforcement of the P2B Regulation was another element that could have contributed to the paradigm shift towards European online economic actors, fueling the trend towards ex-ante regulation in the digital field ([Graef & Costa-Cabral, 2020](#)).

Efforts in applying the Regulation's provisions should consider Member States' actions in designating competent authorities to enforce legislation, but also in publishing guidelines on the Regulation's enforcement, aiming at ensuring clarity and predictability for intermediation service providers, allowing them to better understand the extension and level detail of the obligations they must comply with. From this perspective, data from the report reveals that Member States' efforts to

⁸ i.e. recitals 15-18 of the P2B Regulation.

implement and enforce the P2B Regulation have not been consistent, with at least 7 Member States not having adopted national legislation to implement the P2B Regulation, while only 15 Member States had designated an authority responsible for the actual enforcement of the text ([REPORT FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS on the first preliminary review on the implementation of Regulation \(EU\) 2019/1150 on promoting fairness and transparency for business users of online intermediation services](#), p. 11).

This approach may be seen as counterproductive to the scope of the legislation in the first place, alternatively fostering unfair competition for intermediation service providers operating in Member States where the Regulation is enforced, perhaps even encouraging operations from a Member State that is enforcing the provisions to move to a Member State that is delaying the operationalization of the P2B Regulation.

Finally, in line with the idea that the legal provision would represent a significant shift towards how business relations between professionals (“intermediaries” and “business users”) are conducted in the online world, guidelines for the application of these legal provisions are relevant for a better understanding of the legislator’s purpose and may contribute to increasing compliance.

On the other hand, at the Member State level, only two Member States ([REPORT FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS on the first preliminary review on the implementation of Regulation \(EU\) 2019/1150 on promoting fairness and transparency for business users of online intermediation services](#), p. 21) have initiated such instructions, the other actors included in the scope of the Regulation being guided exclusively by the Commission’s guidelines, which could indicate the low readiness of Member States for the digital sector or perhaps even a reluctance in the success of the Regulation in question, the following reports and the implementation level clarifying to what extent one of the hypothesis is valid or maybe even pointing to a different one.

3. DSA & DMA – CLOSING THE GAP IN EU’S POLICY

Prior to the adoption of the legislative package including DSA ([Regulation \(EU\) 2022/2065 of the European Parliament and of the Council of 19 October 2022 on a Single Market For Digital Services and amending Directive 2000/31/EC, partially in force since February 2024 \(for very large platforms - VLOPs\), full enforcement starting on 17th February 2024;](#)) and DMA ([Regulation \(EU\) 2022/1925 on contestable and fair markets in the digital sector, in force since November 2022](#)), the key regulatory provisions governing the activities of intermediary service providers were, as already mentioned, E-commerce Directive and P2B Regulation. However, at the Member State level, two regulatory directions started to emerge as a way for platforms to comply.

The role of the DSA & DMA is to bring a whole new approach to governing economic relations within a platform’s economy - starting with competition aspects, covered by the scope of the DMA, and continuing with platform facets via obligations set out in DSA.

As a result of the intention to cover many of the various possibilities for platforms to challenge regulators, a dual regulatory approach has been developed - a blend of ex-ante regulation, which focuses on competition-related behavior and the imposing of specific obligations.

The common element of the two regulations can be seen as the reference to economic criteria in assessing the quality of an online actor as a gatekeeper or a VLOP. This element, although not completely new, can be considered as a change of approach in the underlying method of regulating the digital sector, where economic criteria gain significant relevance, that could even be further correlated to the cost implementation and economic effectiveness analysis of these provisions both for the undertakings covered by the scope of the regulations, but also for the enforcement and monitoring authorities (either Commission or national authorities).

Considering this article's scope, analysis of the DMA Regulation will consider mainly two points: the ex-ante approach in terms of regulation and its enforcement, as well as analyzing categories of obligations imposed on undertakings included in the scope of the Regulation.

Given that Articles 101 and 102 TFEU and Member States' national legislation are applicable to address post factum market behavior, the DMA Regulation is designed to set out obligations for digital players which essentially meet several economic criteria (see Art. 3 DMA). In other words, if prior to the application of the DMA Regulation, the Commission or Member States were investigating post factum market behavior of undertakings, under Art. 3 DMA, designation of digital market players as gatekeepers, based on economic criteria, triggers their inclusion in the scope of the Regulation and the imposition of three categories of obligations (De Steel, 2024), namely: transparency obligations (Art. 5 (9) and (10), art. 6 (5) DMA), obligations to refrain from a series of practices/behaviors towards users (professionals or even consumers) and data access obligations (covering again professionals but also consumers).

In terms of transparency obligations, it is noticeable that these relate to contractual elements of the gatekeepers' relationship with service users that had been partially addressed in other European legislation, in P2B Regulation. Specifically, the DMA Regulation imposes gatekeepers the obligation of not according to any preferential treatment to their own services in ranking and indexing, which is equivalent to prohibiting self-preferencing, a practice that was sanctioned by the Commission in the case of Google Shopping. In this sense, the general obligation of transparency vis-à-vis ranking products and services, laid down by the P2B Regulation and through provisions of the Omnibus Directive, acquires a new dimension, adding a prohibitive component and being part of a set of rules complementary to the competition rules, indicating its special significance within EU rules.

Finally, DMA Regulation, although presented as an ex-ante regulatory tool, bringing the burden shifting benefit, i.e. the obligation for gatekeepers to prove compliance with Regulation's provisions, appears in fact to be a partial tool using rather mechanisms to prevent potentially anti-competitive behavior in markets gatekeepers operate in. This perspective is supported by a shift in the burden of proof, which is only valid for the ex-ante measures (Art. 5 (9) and (10), art. 6 (5) DMA) that gatekeepers must comply with, since in case of a breach, it is the Commission that must prove reduced compliance to have grounds for a sanction. It still depends on the extent to which the partial burden-sharing will result in the efficiencies pursued by the Commission, i.e. increased competition in the regulated markets and reduced response time in case of potential non-compliance with ex ante obligations.

The other regulation in the package, namely the DSA Regulation, is structured around the reformulation of the concept of limited liability of online intermediaries, proposing to revise the concept of the E-commerce Directive, an intention visible from the very first proposal of the text (Cauffman & Goanta, 2021, p. 760).

Intended as a regulation with horizontal application and complementary to other European texts governing various aspects related to intermediation online services, the DSA Regulation focuses on the responsibilities of intermediaries for services offered to consumers by professional users through intermediation services, relevant for this conclusion being in particular obligations under Chapter III - the so-called *due diligence obligations*, including establishing a single point of contact for interaction with authorities, users and any other third parties, imposing traceability obligations on sellers, but also obligations to report on measures taken, e.g. in the case of orders from authorities.

As has been already pointed out in previous opinions (Cauffman & Goanta, 2021, p. 761) and this article (section on the legislative context prior to the adoption of the package), transparency obligations on platforms do not represent a novelty in European policy, since platforms are already required to collect information on the status of the partners listed on the platform as traders or non-traders (Omnibus Directive, art. 6a) and to provide end-users (consumers) with information on the identity and contact details of these partners. From this perspective, at least some of the information the DSA proposes mandatory information to be collected by platforms is already mandatory information to be provided to consumers, thus necessary to be collected (the identity of the partner listed on the platform is an essential element to conclude a contract), with the additional obligation consisting in the auto certification of the partner on the services and products offered on the platform.

The DSA Regulation covers obligations for both VLOPs and platforms falling into the scope of the European text, irrespective of the economic criteria. Thus, while the P2B Regulation sets transparency obligations for product and service ranking and for the governance of contractual agreements (transparent terms and conditions and updating only after notification), the DSA Regulation adds a mechanism of notice and action, allowing a platform to suspend or terminate services for reasons related to illegal content or in contradiction with the terms and conditions of the platform.

The obligation is not a novelty, as these instruments represented the legal basis for platforms under the P2B Regulation, whereas under the DSA Regulation, it is the level of detail that the platform must provide (Art 17 (3) DSA), as well as reporting these decisions directly to the Commission's official database that is surprising.

It should be mentioned that such a database is already operational and applicable to VLOPs, storing a significant volume of information (approx. 1.6 billion decisions (European Commission, n.d.-b)), given that 17 February is the date when all relevant platforms will upload data for the purpose of reporting. To what extent data can be collected, but also what is the specific scope of the data collection and to what extent it will be grounds for further action, is still to be tracked in the DSA enforcement process.

4. CONCLUSION

Choosing a legislative package based on both ex-ante and ex-post horizontal regulation underlines the shift in focus of European policymakers, signaling that understanding the complexity of the digital economy is crucial to tackling it and is intended to cover areas identified as insufficient or not consistently addressed at Member State or even EU level.

Whereas intermediation service providers continue to benefit from a conditioned limited liability, exemptions under DSA provisions are expected to be challenged by enforcement authorities,

and platform commitment is required to achieve the intended scope, particularly as the provisions of the E-Commerce Directive are aligned with DSA Regulation and success in the implementation of P2B Regulation is pending. To what extent enforcement will involve additional costs for platforms covered by scope and whether such costs will be transferred to consumers or professional users is a matter for further research.

Enforcement of DMA Regulation, on the other hand, could be the decisive factor in assessing whether further regulation of the digital sector is an appropriate solution to balance the economic power of online platforms or whether additional instruments are needed or some of those already in place will be dropped.

Cooperation between Member States in the application of national law, Articles 101 and 102 TFEU and the Commission's application of the DMA could prove to be essential for the success of the effort to correct markets where designated gatekeepers are operating. To be monitored will certainly be the economic effects of the implementation of the DMA, both for gatekeepers, consumers, and professional users of gatekeepers' services, as well as to what extent will innovation be the result of the concepts of interoperability and data access or whether, on the contrary, regulatory costs will have a negative impact in the markets where gatekeepers operate.

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Reflections of European Market Law on the Croatian Legislative Framework of Consumer Protection

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Abstract: *European legislation has had a significant impact on the development of consumer protection in Croatia. As a member of the European Union, Croatia is obliged to implement and enforce EU directives and regulations related to consumer rights and protection. The main legal framework for consumer protection in Croatia is the Consumer Protection Act (Zakon o zaštiti potrošača NN 19/22, 56/23) and European legislation has played a crucial role in shaping it. It has contributed to the establishment of robust consumer rights, harmonized standards, and improved mechanisms for resolving consumer disputes. By aligning its legislation with EU directives and regulations, Croatia has integrated itself into a broader framework of consumer protection that spans across the European Union.*

The paper analyses the new Consumer Protection Act which entered into force in May of 2022, completely replacing the previous Act of the same name from 2014. The main reason for adopting the new Consumer Protection Act was the implementation of Directive (EU) 2019/2161 and regulation of digital segment of the conclusion of contracts to a greater extent than it was before.

1. INTRODUCTION

The European Union's internal market, also known as the Single Market or Common Market, is a unified marketplace defined in Article 26 (ex Article 14 TEC) of the **Consolidated version of the Treaty on the Functioning of the European Union (2012)** as “an area without internal frontiers in which the free movement of goods, persons, services and capital is ensured in accordance with the provisions of the Treaties.” (Weatherill, 2017)

As **Garben and Govaere (2022)** state, by creating an internal market, the European Union has evolved into a tightly integrated and interconnected system encompassing the market, economy, and society. This development aligns with the deliberate and conscious decisions made by the Member States. The amalgamation of markets and the establishment of economic interdependence have played a crucial role in upholding peace and stability among the European Union's Member States for more than seven decades (Horak et al, 2014; Weatherill, 2017; Craig & de Burca, 2011).

Despite the considerable advantages that the single market has bestowed upon European citizens and businesses, the seamless free movement of goods, services, capital, and people has encountered challenges (Schütze, 2021; Peers & Barnard, 2023). In specific areas, a genuinely integrated European market was hindered by the absence of necessary legislation, administrative hurdles, and inadequate enforcement, preventing the full realization of the single market's potential. Recognizing this need, the European Commission has adopted the Single Market

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Act, a set of measures aimed at fortifying the European economy and generating employment (Schütze, 2023; Peers & Barnard, 2023). The Single Market Act, introduced in two phases in 2011 and 2012, presents initiatives to maximize the advantages provided by the single market.

The Single market is based on several key principles and consumer protection is an important aspect of European Union law and policy framework. It is clearly defined in the Consumer Acquis (Articles 4(2)(f), 12, 114 and 169 of the Treaty on the Functioning of the European Union and Article 38 of the Charter of Fundamental Rights of the European Union), which comprises a collection of rules and regulations adopted by the EU over time to uphold the rights and interests of consumers.

EU legislation has had a significant impact on the development of consumer protection in Croatia and its intensive development began with the signing of the Stabilization and Association Agreement between the Republic of Croatia and the European Communities and their member states (Mišćenić, 2013; Vrček, 2014). As a member of the European Union, Croatia is obliged to implement and enforce EU directives and regulations related to consumer rights and protection. The main legal framework for consumer protection in Croatia is the Consumer Protection Act, Official Gazette No. 19/22, 56/23. (in Croatian: *Zakon o zaštiti potrošača Narodne Novine 19/22, 56/23*).

This article aimed to identify the reflections of European market law on the Croatian legislative framework of consumer protection as its member state and the advantages it brings to citizens. The research methodology involved an analysis of secondary data and a critical review of the literature.

2. EUROPEAN UNION MARKET LAW AND FOUR FREEDOMS

It is a rather axiomatic statement that the free movement provisions are part of the foundations of the European Union project and that they are among the fundamental principles of the Treaty (Garben, 2021, p 5). These key principles and objectives of the European Internal Market include free movement of goods, freedom of establishment and services provision, free movement of capital, and free movement of persons (Schütze, 2023; Peers & Barnard, 2023; Bodiroga-Vukobrat et al., 2011; Horak et al., 2014; Gongeta, 2014; Mišćenić, 2013).

Free movement of goods originating in Member States, and of goods from third countries which are in free circulation in the Member States, is one of the fundamental principles of the Treaty on the Functioning of the European Union (Article 26 and Articles 28 - 37 28, ex Article 23 TEC). Initially, the unrestricted movement of goods was perceived as an integral component of a customs union among Member States. This arrangement entailed the removal of customs duties, limitations on trade quantities, and equivalent measures, alongside the implementation of a unified external tariff for the Union (Torino, 2017). Subsequently, the focus shifted towards the elimination of any remaining hindrances to the free movement of goods, with the overarching goal of establishing the internal market (Perišin, 2008).

Freedom of establishment and freedom to provide services are stated clearly as fundamental in Articles 26 (internal market), 49 to 55 (establishment) and 56 to 62 (services) of the Treaty on the Functioning of the European Union. The construction of the European Union Single Market requires the elimination of all the barriers to the freedom of establishment of companies as well as the adoption of uniform, or at least harmonized rules for their mobility (Andreeva, 2022,

p. 346). The fundamental principle is that individuals who are citizens of the European Union, as well as legal entities established in compliance with the laws of a Member State and having their registered office, central administration, or primary place of business within the European Union, have the right to engage in economic activities in any Member State consistently and continuously, irrespective of their nationality or method of incorporation (Arnall, 2023). As Arnall (2023), Andreeva (2022), Barnard (2022) and Gongeta (2014) as well as numerous authors cited in that last paper state, it was precisely the freedom of establishment that was the cause of regulatory competition and numerous reforms of company law in the European Union. Freedom to provide services ensures that service providers are subject to the rules of their home country when operating in another member state. This freedom is mostly regulated with so-called Directive on Services in the Internal Market (Directive 2006/123/EC of the European Parliament and of the Council of 12 December 2006 on services in the internal market OJ L 376, 27.12.2006, p. 36–68) that aims to remove barriers to the cross-border provision of services and facilitate the freedom of establishment for service providers within the EU.

The legal basis for the free movement of capital is stated in Articles 63 to 66 of the Treaty on the Functioning of the European Union. By removing restrictions on capital movements between Member States as well as between Member States and third countries free movement of capital underpins the single market. Additionally, it fosters economic growth by facilitating efficient capital investment and encourages the utilization of the euro as a global currency, thereby enhancing the EU's position as a key global player. Furthermore, it played a crucial role in the advancement of the Economic and Monetary Union and the implementation of the euro (Horak et al., 2014; Barnard, 2022).

Free movement of persons/workers includes the rights of movement and residence for workers, the rights of entry and residence for family members, and the right to work in another Member State and be treated on an equal footing with nationals of that Member State. It is laid down in Article 3(2) of the Treaty on European Union and Articles 4(2)(a), 20, 26 and 45-48 of the Treaty on the Functioning of the European Union. According to Eurostat data, in 2021, among European Union citizens of working age (20-64), 3.9% (10.2 million) resided in a European country other than that of their citizenship – up from 2.4% in 2009. Additionally, 1.7 million cross-border workers and 3.6 million postings were recorded (Goldner Lang, 2007; European Parliament., n.d.).

At the end of this chapter, it can be concluded that the European Union Internal Market Law plays a crucial role in fostering economic growth, competitiveness, and cohesion among EU member states by breaking down barriers to trade and ensuring a level playing field for businesses and consumers. The legal framework is continually evolving to adapt to new economic challenges and developments, especially in the time of digital revolution (Catalina, 2021).

Analysing all above, it is clear that European Market Law includes and regulates various public and private law policies such as Fundamental rights, Environmental protection, Competition Law, Sustainable development, Intellectual Property, Digital Single Market, E-commerce Rules and something that is part of everything mentioned: Consumer Protection (Kelemen, 2011).

European consumer policy aims to make the European Union (EU) a tangible reality for 500 million citizens by guaranteeing their rights as consumers. Articles 4(2)(f), 12, 114(3) and 169 of TFEU and Article 38 of the Charter of Fundamental Rights of the European Union constitute the primary law for consumer protection policy. Article 169 TFEU defines specific objectives of the policy: “In order to promote the interests of consumers and to ensure a high level

of consumer protection, the Union shall contribute to protecting the health, safety and economic interests of consumers, as well as to promoting their right to information, education and to organise themselves in order to safeguard their interests.” Key EU policy areas related to consumer protection are Product safety, Digital market, Financial services, Food safety and labeling and Energy (Valant, 2015).

3. CONSUMER PROTECTION IN CROATIA

As mentioned before, European legislation has had a significant impact on the development of consumer protection in Croatia. As a member of the European Union, Croatia was obliged to implement and enforce European Union directives and regulations related to consumer rights and protection. This means that Croatian consumer protection laws are aligned with EU directives and regulations, ensuring a consistent level of protection for consumers across the EU.

By providing a common framework for product safety, labeling, and information requirements and through harmonization of laws, standards and regulations for consumer protection in general, European legislation has improved consumer protection in Croatia.

Consumer Rights, Unfair Commercial Practices, Cross-border Consumer Protection Consumer Education and Empowerment, Consumer Complaints and Dispute Resolution, alternative dispute resolution mechanisms, such as mediation or arbitration and Consumer Organizations are the most important parts regulated through the national and supranational levels in Croatia.

Consumer protection in Croatia is governed by several laws and regulations aimed at safeguarding the rights and interests of consumers. The main legal framework for consumer protection in Croatia is the Consumer Protection Act Official Gazette 19/22, 56/23 (in Croatian: *Zakon o zaštiti potrošača Narodne Novine 19/22, 56/23*).

The Consumer Protection Act defines various consumer rights, including the right to accurate and clear information, the right to safety and quality of goods and services, the right to protection of personal data, the right to contractual remedies, and the right to file complaints and seek compensation.

In order not to get the wrong impression and lead to the wrong conclusion, it is important to point out that consumer protection in the Republic of Croatia did not start in 2022. So, this is the timeline of the legislative framework in consumer protection in the last two decades: *Zakon o zaštiti potrošača 2022. -2023.*, *Zakon o zaštiti potrošača 2019. -2022.* (Official Gazette /Narodne Novine 41/14, 110/15, 14/19) in force 15.02.2019. - 28.05.2022., *Zakon o zaštiti potrošača 2015. -2019.* (Official Gazette /Narodne Novine 41/14, 110/15) in force 21.10.2015.- 14.02.2019. and *Zakon o zaštiti potrošača 2007. -2014* (Official Gazette /Narodne Novine 79/07, 125/07, 79/09, 89/09, 133/09, 78/12, 56/13) (ceased to be valid).

The new Consumer Protection Act (2022) entered into force on 28th May 2022 completely replacing the previous Act of the same name from 2014, which has undergone only two significant amendments, and it was part of the implementation of new European rules on the Consumer Protection Act to digital services.

The new Act introduced the definition of the online marketplace (accompanied by recent amendments to the Obligations Act regarding the trader’s responsibility for material deficiencies and

commercial guarantee) pre-contractual information and the conclusion of distance agreements more numerous and stricter penalties for traders for infringements of the provisions of the Act.

The continuous development of digital tools necessitated a greater inclusion of digital contract conclusion segments in the legislation than previously. This was addressed in the updated Consumer Protection Act, which was officially published in the Official Gazette no. 19/22 on February 11, 2022. (Narodne Novine, 2022). The delay in its enforcement provided traders ample time to adjust their operations to the new requirements mandated by the Act.

The Consumer Protection Act serves as the primary legislation governing consumer relationships. It is further supported by the Obligations Act, which deals with general contractual relations, along with the Services Act and the Electronic Trade Act, which address specific areas (Josipović, 2020; Klarić & Vedriš, 2014; Mišćenić, 2013).

The principal innovation in the new Consumer Protection Act is its broadened application to digital services. These services are now characterized as those that enable consumers to create, process, store, or access data digitally, as well as those facilitating the sharing or interaction with digital data uploaded or created by the consumer or other users. This includes video and audio sharing platforms, file hosting services, cloud storage, e-mail, social media, and cloud-based applications (Konačni Prijedlog Zakona o zaštiti potrošača P.Z.E. br. 175).

Additionally, Article 4 of the new Consumer Protection Act defines online marketplaces. These are services that utilize software, such as websites, parts of websites, or applications, managed by or on behalf of a trader. These services enable consumers to enter into distance contracts with other traders or consumers. The Act also defines terms such as functionality, interoperability, compatibility, and commercial guarantees (Stazić, 2022).

These updates are complemented by recent changes to the Obligations Act, which address the trader's responsibility for material defects and commercial guarantees. These provisions are mainly focused on contract performance and liability for material defects (Slakoper & Nikšić, 2022; Stazić, 2022).

In the realm of digital services, the new Consumer Protection Act now encompasses consumer contractual relationships, including those contracts in which a trader supplies or agrees to supply digital content or services to consumers (Slakoper & Nikšić, 2022).

Unlike traditional transactions, consumers do not pay with money but instead, provide or agree to provide personal data to the trader. However, this does not apply if the trader processes the personal data solely to deliver the digital content or service, or to meet legal requirements, and does not use the data for any other purpose.

This Act introduces numerous changes, particularly regarding pre-contractual information and the formation of distance agreements. One notable update is the extension of the obligation to provide pre-contractual information to include internet market providers.

Regarding contract performance, a significant update pertains to the costs associated with determining material deficiencies at the moment the risk is transferred. Unlike the previous Act, which always placed the burden of these costs on the trader, the new Act requires the trader to cover these costs in advance (Stazić, 2022).

Another notable aspect of consumer protection changes is the handling of material deficiencies or non-compliance of digital content or services with contractual agreements. If such issues arise after the prescribed period but within two years from the date the risk was transferred to the consumer, the initial cost for expertise will be borne by the consumer. Ultimately, the final responsibility for these costs will depend on the outcome of the expertise, determining whether the trader or the consumer should bear the expense.

In addition to these procedural updates, the new Consumer Protection Act has introduced numerous and stringent penalties for traders who violate its provisions. This tightening of regulations stems from the transposition of an EU Directive aimed at bolstering consumer rights. The Government of the Republic of Croatia has highlighted that this directive mandates the imposition of penalties that are effective, proportionate, and dissuasive. These penalties are particularly significant in cases of cross-border infringements where consumer rights are violated on a large scale. The severity of the fines will be linked to the annual turnover of the offending trader, ensuring that the penalties are impactful and serve as a strong deterrent against future violations.

In May 2023 the Croatian Parliament unanimously adopted the Law on Representative Claims for the Protection of Collective Interests and Consumer Rights (in Croatian; *Zakon o predstavničkim tužbama za zaštitu kolektivnih interesa i prava potrošača Narodne Novine 59/23*) which should enable complete and timely protection of consumer rights and faster court proceedings.

The law prescribes the rules of the litigation procedure which decides on violations of consumer rights in numerous areas, from general consumer rights and passenger rights to the protection of personal data of users of electronic communications, tourist services and finance.

Presumptions under which associations and federations of associations for consumer protection can be included in the list of authorized bodies for filing petitions and lawsuits are also prescribed.

4. CONSUMER PROTECTION IN THE DIGITAL ERA

As *Valant (2015)* noticed “Constant developments in the area of digital technology are fundamentally changing the way consumers interact and shop online. Consumer protection in the digital single market is one of the main priorities of European policymakers – to systematically consider the rights and needs of consumers in a rapidly changing digital environment.”

The digital revolution changed all the aspects of our lives. One way of consumer protection in the digital era is by empowering consumers and those who protect them with LegalTech (*Braun et al, 2019*).

The most important regulations governing online activities and cross-border e-commerce to enhance the digital single market are so-called Digital Directives: *Directive (EU) 2019/770 of the European Parliament and of the Council of 20 May 2019 on certain aspects concerning contracts for the supply of digital content and digital services*, *Directive (EU) 2019/771 of the European Parliament and of the Council of 20 May 2019 on certain aspects concerning contracts for the sale of goods*, amending Regulation (EU) 2017/2394 and Directive 2009/22/EC, and repealing Directive 1999/44/EC (*Petrović, 2023*) and *Directive (EU) 2019/2161 of the European*

Parliament and of the Council of 27 November 2019 amending Council Directive 93/13/EEC and Directives 98/6/EC, 2005/29/EC and 2011/83/EU of the European Parliament and of the Council as regards the better enforcement and modernisation of Union consumer protection rules (Leaser & Caruana, 2021).

Having in mind that Consumer spending represents 54% of the European Union's GDP, the European Commission adopted on 13 November 2020 the New Consumer Agenda. It represents a strategic framework to tackle the new challenges through five key areas: empowering consumers to play an active role in green transition; digital transformation and ensuring consumers are as protected online as they are offline; effective enforcement and redress ensuring all consumers fully benefit from their rights; reducing Consumer vulnerability by strengthening consumer awareness, addressing the needs of different consumer groups and finally, promoting high-level consumer protection abroad (New Consumer Agenda 2020 – 2025 actions to protect European Consumers, 2022).

5. CONCLUSION

Since its establishment in 1993, the Single Market has increasingly embraced competition, generating employment opportunities and diminishing numerous trade barriers. The free movements and fundamental freedoms as the foundation of the Single market contribute to the European Union's overall resilience during crises by establishing a more diverse and integrated market with a broader array of goods and services.

The Single Market Act, introduced in two phases in 2011 and 2012, presented initiatives to maximize the advantages provided by the single market. The goal was to enhance employment prospects and instill greater confidence in European business and consumer protection.

The digital revolution has changed all aspects of our lives and it has led to reforms of the European legislative framework and its Member States. The new Croatian Consumer Protection Act introduced European standards into the Croatian legislative framework and thus directly increased the level of protection of its citizens as consumers.

Finally, it can be concluded that the European legislator corresponds substantially to the challenges of the digital revolution and monitors the pace of modern market developments by putting consumers at the forefront of protection.

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Beyond Adjudication: European Court of Human Rights Pilot Judgment's Role in Shaping Albanian Legislation

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Abstract: Attempting to address systemic violations of human rights on the domestic level, pilot judgments impose an obligation on States to take remedial measures to prevent vast numbers of repetitive applications or clone cases before the European Court of Human Rights (ECtHR or the Court). Accordingly, they serve as catalysts by fostering transformative changes within a state's legal framework and aligning domestic law with the European Convention of Human Rights standards.

The paper aims to analyze the procedure and features of pilot judgments, enshrined in Rule 61 of Rules of Court. Delving on ECtHR case law, it gives a brief overview of the pilot judgment procedure adopted for Albania's structural dysfunction of non-compensation for properties nationalized during the communist regime in *Manushaqe Puto and others v. Albania*. Furthermore, the effectiveness of remedies undertaken by the Albanian authorities is assessed.

The paper concludes by emphasizing the proactive role played by the ECtHR in shaping Albania's legislation and hence advancing the protection of property rights.

1. INTRODUCTION

Albania's admission to the Council of Europe in 1995 imposed the obligation of ratification of the European Convention for the Protection of Human Rights and Fundamental Freedoms (ECHR) (Council of Europe, 1950) and, hence the acceptance of the European Court of Human Rights (ECtHR or the Court) jurisdiction. As a Contracting Party, Albania is obliged to implement the decisions and judgments of ECtHR and effectively guarantee the fundamental rights and freedoms sanctioned in the Convention and its Protocols in compliance with Articles 1 and 46 of ECHR.

A quite instrumental category of judgments of ECtHR are the pilot judgments since they have the potential to prompt legislative, and administrative amendments and changes in domestic court case law. Rule 61 of Rules of Court stipulates that a pilot judgment procedure may be initiated by the Court to respond to a structural human rights dysfunction in Contracting States that has triggered repetitive applications (ECtHR, 2023).

Concerning Albania, ECtHR has delivered only one pilot judgment, *Manushaqe Puto and Others* against Albania, (ECtHR, 2012) dealing with the structural dysfunction of non-compensation for properties nationalized during the former communist regime. In addition, a brief overview is provided.

The paper aims to analyze the procedure of pilot judgments and, particularly, to examine the impact of the ECtHR pilot judgment, *Manushaqe Puto and Others* on the amendments and development of Albania's legal framework, relating to the right of property.

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The impact will be assessed in terms of legislative changes affecting the restitution and compensation of former owners' properties, as well as the way the ECtHR's decision-making has been reflected in the practice of national courts (Constitutional Court and Supreme Court).

The paper intends to address the following research questions:

- How has the ECtHR Pilot Judgment impacted legislative changes in Albania concerning property rights?
- What new laws and bylaws have been enacted?
- How have the implications of ECtHR pilot judgment been incorporated within the practices and decisions of the Albanian courts?

Research methods consist of:

1. Doctrinal research on international and national legal acts, such as the European Convention on Human Rights (ECHR), Rules of ECtHR (Rule 61), Law "On Treatment of Property and Finalisation of the Property Compensation Process Act (Property Act 2015) (Assembly of the Republic of Albania, 2015), and bylaws regarding restitution and compensation of property, to identify important amendments following the adoption of pilot judgment.
2. The analysis of the case law of the ECtHR and domestic courts, specifically (the Constitutional Court and Supreme Court), Pilot Judgment *Manushaqe Puto and others v. Albania*, as well as other countries' judgments on non-enforcement of final administrative or court decisions recognizing applicants' entitlement to compensation *in lieu* of restitution of property confiscated by former communist regimes, published in the HUDOC database.
3. Research in the relevant academic scientific papers.

2. PILOT JUDGMENT PROCEDURE

The pilot judgment procedure was established as a result of the Committee of Ministers' adoption of Resolution (Res (2004)3) on "Judgments Revealing an Underlying Systemic Problem" (Committee of Ministers, 2004) and Recommendation (Rec (2004)6) on "The Improvement of Domestic Remedies" (Committee of Ministers, 2004). According to Rec (2004)6, in response to a significant number of applications, the Committee of Ministers invited states to establish an effective remedy in domestic legislation enabling them to obtain redress at the national level and to prevent similar claims before the Court (para. III). *Broniowski v. Poland*² (ECtHR, 2004) was the first judgment, the ECtHR addressed the Committee of Ministers' resolution and recommendations.

Despite not being explicitly defined in the European Convention on Human Rights, in February 2011, the Court amended its Rules of Court to include a regulatory framework for pilot judgments in Rule 61 (ECtHR, 2023).

Whereas article 46(1) of the ECHR requires a State that violated the Convention to abide by the final judgment in any case in which it is a party, the Court's authority to issue pilot judgments stems from this provision and is complemented by Rule 61 of the Rules of the Court.

² The failure of compensation scheme of Polish authorities to compensate the applicant for property that he and his family had lost after being forced to relocate to Western Poland, leaving behind their home and property located beyond the Bug River, led the ECtHR to find a violation of Article 1 of Protocol No.

A pilot judgment requires *per definition* that the respondent State tackles a structural problem, which usually necessitates adopting a wide range of measures of a legal, administrative, and/or logistical nature that may come at a considerable cost.

The object of the Court's designating a case for a "pilot-judgment procedure" is to facilitate the speediest and most effective resolution of dysfunction affecting the protection of the Convention rights in question in the national legal order as reiterated in the case *Wolkenberg and Others v. Poland* (ECtHR, 2007).

A systemic/structural problem may be considered to be a "dysfunction" in the national legal system when it leads to numerous applications before the Court in Strasbourg. The latter defines such a problem in the context of the specific circumstances of a case before it (Committee on Legal Affairs and Human Rights, 2011, para 8).

Once such a defect has been identified, it falls to the national authorities, under the supervision of the Committee of Ministers, to take, retroactively if appropriate, the necessary remedial measures by the subsidiary character of the Convention (ECtHR, 2006). However, the Court indicates which execution measures the respondent State may or must take in some 'special circumstances', which include pilot judgments (ECtHR, 2009), (para. 88).

The Court usually refrains from making an "order" and instead normally only "recommends" or merely "indicates" which measures a respondent State ought to take to stop a violation (Sushko, 2019, p. 52).

It may direct in the operative provisions, that the remedial measures be adopted within a specified time, bearing in mind the nature of the measures required and the speed with which the problem it has identified can be remedied at the domestic level (Rule 61(4)). In case the respondent state, fails to adopt such measures and continues to violate the Convention, the Court will resume examination of all similar applications pending before it and take them to judgment to ensure effective observance of the Convention (ECtHR, 2009) (para. 128).

If the state has fulfilled the general measures undertaken, the Committee of Ministers through a resolution declares the closing of supervision (Committee of Ministers, 2018).

The pilot-judgment procedure is on the one hand strictly linked to the obligation of member states to take general measures to eliminate the causes of the violation to prevent its repetition whilst, on the other hand, this procedure constitutes a technique to tackle the backlog pending before the ECtHR (Paraskeva, 2006). Furthermore, in the case *Hutten-Czapska v. Poland*, (para. 236) the Court asserted that "*the potential inflow of future cases is also an important consideration in terms of preventing the accumulation of repetitive cases on the Court's docket, which hinders the effective processing of other cases giving rise to violations, sometimes serious, of the rights it is responsible for safeguarding*" (ECtHR, 2006)

3. THE RELEVANCE OF "MANUSHAQE PUTO AND OTHERS V. ALBANIA"

3.1. Structural Dysfunction in Albania: A Comprehensive Overview

The property right is a fundamental right enshrined in Article 41 of the Albanian Constitution (Republic of Albania Assembly, 1998) and Article 1, Protocol No.1 of ECHR (Council of

Europe, 1952). One of the most sensitive issues for Albanian society, with significant social, moral, and economic consequences has been the restitution and compensation for private property nationalized, expropriated, confiscated, or unjustly taken in any other way, by the state after November 29, 1944 (Constitutional Court, 2021) (para. 43). The transition in Albania's political system in 1991 resulted in substantial changes in the legislation governing property rights. The Albanian legislator has made an effort to correct, as far as possible, the injustices done to expropriated subjects, under the rule of law and international norms (Constitutional Court, 2021). Nevertheless, the abrogation of the legislation adopted by the communist regime for about 50 years, cannot lead to the restoration of property relations as they were before 1944, nor to the full compensation of damages suffered, due to objective changes in time and for justified legal reasons (Constitutional Court, 1994).

As stipulated in Protocol No. 1, the ECHR does not obligate States Parties to restore property confiscated by former regimes (ECtHR, 2004) (para. 35).

The full restoration of previous property rights would be contrary to the very principle of equality (Constitutional Court, 2021) (para. 47). However, once a Contracting State has ratified the Convention and Protocol No.1, and enacts legislation providing for the full or partial restoration of property confiscated under a previous regime, such legislation may be regarded as generating a new property right protected by Article 1 of Protocol No.1 (ECtHR, 2004). The same may apply to pre-ratification arrangements for restitution or compensation if such legislation remained in force after the Contracting State ratified Protocol No.1 (ECtHR, 2004).

Notwithstanding legal and institutional efforts over the years, the ownership problem has not been settled. For instance, the non-execution of final administrative decisions of the Commission for the Restitution and Compensation of Property continues to be critical. Even though the expropriated subjects were recognized property rights, they did not receive compensation. The ECtHR has judged a considerable number of applications lodged against Albania, alleging violation of length of proceedings (Article 6/1 of ECHR), right to property (Article 1 of Protocol no.1) and right to an effective remedy (Article 13) in respect of non-execution of final administrative decisions recognizing the right to compensation *in lieu* of restitution of property. In more than 80% of the judgments delivered against Albania, the Court has found at least one violation of the Convention, and 20.78% of the findings concern the infringement of property rights (ECtHR, 2023).

Culminating in *Manushaqe Puto and Others* pilot judgment³ delivered to Albania, the Court maintained that the application of the procedure was necessary considering “*the large number of problems besetting the compensation mechanism which continue to persist after the adoption of judgments in the cases of Driza, Ramadhi and Others, Vrioni and Others and Delvina*” as well as due to the “*urgent need to grant applicants speedy and appropriate redress at the domestic level*” (ECtHR, 2012) (para. 109). The flaws in the compensation mechanism, involved the complexity of legislative provisions, frequent changes (at least seven times between 2004 and 2010), and inconsistent judicial practice, which led to a lack of legal certainty. The Court reiterated that the Government Action Plan lacked accurate and reliable information on

³ The case concerned 20 Albanian applicants, former owners or the heirs of former owners of land confiscated by the former communist regime in Albania, who complained about the non-execution of final administrative decisions of the Commission for the Restitution and Compensation of Property, entitling them compensation in lieu of the restitution of the land.

the number of administrative decisions recognizing property rights and awarding compensation since 1993, as well as setting time limits (ECtHR, 2012) (paras.110-116).

Stressing the lack of an effective domestic remedy for the prolonged non-execution of administrative decisions that grant compensation of property, ECtHR recommended the compilation of a database for authorities to calculate and track the overall compensation bill. Besides it urged Albanian authorities to use alternative forms of compensation, as provided for in the 2004 Property Act, to ease budget pressure. Accordingly, transparency and efficiency in the decision-making process, and setting realistic, statutory, and binding time limits were necessary (ECtHR, 2012) (paras. 110-116). In conclusion, the Court demanded Albanian authorities 18 months to fulfill their obligations and, decided to continue the examination of applications lodged before the delivery of the pilot judgment, without prejudice to its power at any moment to declare inadmissible any such case or to strike it out of its list following a friendly settlement (ECtHR, 2012) (para. 121).

3.2. Impact on Legal Amendments and Domestic Courts Case Law

The ECHR, ratified by Albania in 1995, has a privileged position in the legal system, compared to other international agreements as well as in the hierarchy of normative acts sanctioned in Article 116 of the Constitution. Ratified International Agreements are positioned after the constitution and have superiority over laws of the country that are not compatible with it (Article 122). Hence, the ECHR not only has superior power over the laws but Article 17/2 of the Constitution stipulates that in no case restriction of human rights and fundamental freedoms may exceed the limitations provided for in the European Convention on Human Rights.

The ratification of the ECHR requires Albania to protect and guarantee human rights and fundamental freedoms besides the acceptance of ECtHR jurisdiction. Therefore, ECtHR decisions have binding force over the state in any case to which they are parties (Article 46). The decisions of the ECtHR are mandatory to be implemented by the member states of the Council of Europe, parties to the ECHR, thus fulfilling the commitments stemming from its article 46(1). Furthermore, considering Articles 122/2 and 17/2 of the Albania Constitution decisions of the ECtHR are implemented directly.

Referring to the Constitutional Court of Albania, on the occasion of the ratification of the ECHR, the Assembly of the Republic of Albania, as a representative of popular sovereignty, has assumed obligations that are enforceable by all public authorities of the Republic of Albania, including courts of all levels, regardless of their type (Constitutional Court, 2011). As far as the legislative authority is concerned, there is a need to take measures to harmonize the internal legislation (Constitutional Court, 2011).

Accordingly, in response to the pilot judgment, the Albanian Parliament passed Law no. 133/2015 (2015 Property Act), intending to terminate the treatment process of recognition and compensation of the properties that have been expropriated, nationalized, or confiscated, according to laws and bylaws, criminal decisions of the courts or obtained by any other unjustly means by the communist state from 29.11.1944 (Article 2/1); regulation and just satisfaction of property compensation, execution of decisions final compensation, as well as the end of compensation process within defined terms in law (Article 2/2). Subsequently, the Agency for Treatment of Property (ATP) was established. Accordingly, in the exercise of its activity, the Agency aims to

complete the process of recognition of ownership and return or compensation as the case may be, as well as the completion of the compensation process through the execution of all decisions approved for compensation within 10 years. It established a new compensation scheme, in which, the main element of the assessment of financial compensation is the value of the property according to the cadastral category that it had at the time of expropriation (Article 6/a).

To implement the 2015 Property Act, the Council of Ministers passed the following sub-laws:

- Decision No. 221 of March 23, 2016 “On the organization and operation of the Agency for Treatment of Property” (Council of Ministers, 2016). The ATP’s mission is to provide public services, through the examination of the requests of expropriated entities, for the treatment of property, for which no decision has been made, and the examination of the evaluation of the requests for the recognized right to compensation, as well as duties and other services, specified in laws and by-laws in force.
- Decision No. 222 of March 23, 2016, “On the Examination of Requests for the Recognition of the Right to Compensation” (Council of Ministers, 2016), regulates the procedures for the collection, processing, and administration of acts of expropriated subjects and ATP’s decision-making during the process of recognition of the right to compensation, pursuant to law no.133/2015, “On the treatment of property and the completion of the property compensation process.”
- Decision No. 223 of March 23, 2016 “On the determination of financial evaluation and the enforcement of compensation” (Council of Ministers, 2016), determines the rules and procedures for the financial assessment of the right to compensation, distribution of the fund financial and physical, as well as physical compensation in the property of the expropriated subject.

The Property Act 2015 was subject to constitutional review because the methodology adopted for the estimation of financial compensation resulted in a lower amount of compensation than the methodology scheme established in previous laws. In decision no. 1 of 16 January 2017 (“decision no. 1/2017”), the Constitutional Court rejected the request for a stay of the application of the 2015 Property Act as unfounded (Constitutional Court, 2017) (para. 67). Accordingly, the previous laws (the Property Acts of 1993, 2004, and 2006) provided for a scheme with a higher compensation value than that provided for by law no. 133/2015, hence it can be assumed, that they created legitimate expectations for receiving compensation according to the market value of the property at the time of issuing the decision on compensation (Constitutional Court, 2017).

The Court reiterated that “*although the lower amount of compensation cannot be characterized as formal expropriation, it may well be characterized as another “intervention”, which, although it may result in a lower amount of compensation, generally, its respects the proportionality of the intervention in the right to compensation of the property to the former owners and, as such, complies with Article 1 of Protocol 1 of the ECHR*” (Constitutional Court, 2017).

Following the provisions of the Constitutional Court’s decision no. 1/2017, Council of Ministers Decision (CMD) no. 222/2016 was amended by CMD no. 765 of 20 December 2017 “On the examination of requests for the recognition of the right to compensation of property”. Also, CMD no. 223/2016 was amended by CMD no. 766 on 20 December 2017.

Property Act 2015 was the subject of ECtHR evaluation in an inadmissibility decision of 17 March 2020, in the case “Beshiri and Others v. Albania“.

In the Court's view, the Act was effective as a domestic remedy. Accordingly, the methodology of referencing the initial cadastral category of expropriated properties as a basis for carrying out the financial assessment was not *per se* arbitrary. To prevent an excessive burden for expropriated entities, the legal remedy can be considered effective if the total amount of compensation, regardless of the form of compensation, reaches at least 10% of the value that would have been obtained if the financial assessment had been carried out using as a reference the current cadastral category of the expropriated property (ECtHR, 2020) (para. 196).

Once again Property Act 2015 was reviewed by the Constitutional Court in 2021. The court reflected the provisions of ECtHR, restating that the threshold of 10% of the value to be obtained if the current cadastral category of the expropriated property was used as a reference, constitutes the minimum guarantees that must be ensured. Nonetheless, this does not prevent the legislator from making the necessary adjustments within his margin of appreciation, under the requirements of Article 41 of the Constitution and other social, economic, and political factors influencing his decision-making (Constitutional Court, 2021) (para. 69).

Furthermore, Article 53 of the ECHR itself stipulates that the interpretation of the provisions of the ECHR cannot impose levels of protection inferior to those provided by national sources. This is precisely why according to its jurisprudence, the Constitutional Court continually refers to ECHR rulings, admitting their direct impact on the interpretation of constitutional standards for human rights (Constitutional Court, 2011).

It is worth emphasizing that the ECHR's decision in the case of *Beshiri v. Albania*, as well as the Constitutional Court's decision no. 4/2021, influenced the introduction of the legal initiative for the amendment of the 2015 Property Act and the approval of Law no. 77/2022 "On some changes in the law no. 133/2015 "On the treatment of property and the completion of the process of compensation of properties." The minimum threshold of 10% of the property value, when the cadastral category of the property recognized for compensation has changed is thereby reflected. Eventually, the law is suspended by the Constitutional Court until a final examination, following an application lodged by The Muslim Community of Albania requesting the abrogation of several articles of Law no. 77/2022 and its bylaws (Constitutional Court, 2023).

Compliance with ECHR criteria is a requirement not only for the Constitutional Court but also for domestic courts, particularly the Supreme Court, due to its specific reviewing competence, as well as in the direction of judicial practice unification (Constitutional Court, 2011). For instance, in decision No. 242 dated 24.02.2021, the Supreme Court, Civil Bench, assesses that "Law no. 133/2015, specifically articles 15 and 34, should be interpreted **in the light of the jurisprudence of the ECtHR**, in case law against the Albanian State, regarding the claims of the former owners in the recognition process, return and compensation of property" (Supreme Court of Albania, 2021) (para. 15).

4. FUTURE RESEARCH DIRECTIONS

The rationale for conducting this study is the limited availability of studies on the impact of ECtHR decisions in Albania, particularly pilot judgments. In this context, the author considers that this study will serve as a starting point for future research.

Future research could be channeled into assessing the impact of ECtHR jurisprudence in defining the relationships between national and international institutions, particularly the Committee

of Ministers, which is responsible for monitoring their implementation progress. besides that, it is additionally possible to investigate how the ECtHR's jurisprudence impacts the relationships between national courts (the Constitutional Court and the Supreme Court), as well as their interactions with the ECtHR.

5. CONCLUSION

Pilot judgments have a twofold function, primarily, addressing structural dysfunctions in the domestic legislation or courts' practice and imposing obligations on states to undertake general measures and secondly preventing repetitive applications which could increase the backlog of ECtHR.

The Court has delivered only one pilot judgment against Albania. The latter *Manushaqe Puto and Others v. Albania*, related to the sensitive problem of returning and compensating the properties of the former owners. It triggered legislative reforms, institutional reforms, and changes in domestic court practice. Concretely, the enactment of the 2015 Property Act and the bylaws in compliance, the establishment of the Agency for the Treatment of Property an institution that would handle requests for restitution and compensation of properties, and changes in domestic court practices. For instance, to summarize, in a harmonizing decision no.611 of 7 February 2018 (*Supreme Court of Albania, Civil Bench, 2018*), the Supreme Court ruled that “*the Court of Appeal within a disputed immovable property's jurisdiction will examine appeals lodged by former owners against Commission or Agency decisions after the 2015 Property Act entered into force. The court will have full jurisdiction on issues of fact and law and the decision can be appealed in Supreme Court. The Administrative Court of Appeal will examine appeals against compensation determined by the Agency for the Treatment of Property. The first-instance court will also examine third parties' civil actions and counteractions concerning alleged property rights in respect of properties for which the Commission or Agency had given a decision in favor of a former owner*”

To conclude, the delivery of the ECtHR pilot judgment “*Manushaqe Puto and others v. Albania*” has impacted and shaped the domestic legislation regarding the compensation of property as well as practices of domestic courts, but whether the procedure can continue to contribute to this promising development depends on whether the States parties to the Convention execute the pilot judgments fully and with the requisite expedition (*Glas, 2019*).

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Patterns of Geographic Gender Based Violence: Politics, Culture and Development Issues

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Abstract: *This study seeks to investigate and evaluate the phenomena of spatial gender-based violence in Albania. It asks in what ways are gender-based violence patterns and prevalence vary in different regions of Albania. Furthermore, which demographic, political, cultural, and socioeconomic factors are responsible for these regional variations? The study benefits from the frameworks of intersectionality theory and spatial analysis and uses the literature to search for relevant variables that act as intersecting identities contributing to unique forms of violence and discrimination. Survey results indicate that the patriarchal system and gender based norms are two perpetuating variables that are perceived to contribute the most to gender based violence. Economic repercussions were also emphasized, with GGBV restricting women's access to financial independence, career opportunities, and education. Notwithstanding, there is a rising knowledge of the significance of patriarchal institutions, gender norms, and the necessity of gender equality in resolving violence.*

1. INTRODUCTION

This study seeks to investigate and evaluate the phenomena of spatial gender-based violence in Albania. It intends to shed light on the distinctive forms, prevalence, and underlying variables of gender-based violence in different geographic regions. GGBV refers to gender-based violence against persons that occurs in certain geographic locations or is impacted by their features. Domestic violence, sexual assault, forced marriage, female genital mutilation, honor murders, dowry-related violence, and female trafficking are all examples of GGBV.

The literature includes many theories that explore the geographical aspects and patterns of GGP while it relies particularly on Intersectionality theory and spatial analysis as the analyzing frameworks that meet the objectives of this study. Intersectionality theory recognizes the intersections of multiple social identities in shaping experiences of violence while the spatial analysis explores the geographical aspects and patterns of GGBV.

The paper asks in what ways are gender-based violence patterns and prevalence different in different parts of Albania? Which demographic, cultural, and socioeconomic factors are responsible for these regional variations? Original data are collected from Durres city, geographically very close to the capital but with high records of gender based violence. Thus, particularly the paper asks what specific obstacles and challenges communities the Durres, Albania, face in addressing and preventing gender-based violence.

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Understanding the regional distribution of gender-based violence is critical for developing targeted interventions and enabling local communities to address the problem successfully. *First*, it helps in fully comprehending the frequency, manifestations, and trends of gender-based violence throughout Albania's many geographical regions. It delves into the particular issues and dynamics of violence encountered by individuals depending on their gender identity or imposed gender norms. *Second*, the research can assist in identifying vulnerable populations, such as rural women, marginalized communities, or specific locations, that may be subject to greater incidence of gender-based violence. This understanding enables the development and implementation of customized treatments and support services to address the particular requirements of these groups. *Third*, research findings help to inform evidence-based policy and legislative reforms. They give actual data and insights into the impact of existing laws and policies on gender-based violence to policymakers. This knowledge may be used to create more effective and comprehensive policies and legal frameworks that address the distinct regional and Albanian dynamics of violence. Finally, research creates data that may be utilized to increase awareness about the issue of geographical gender-based violence in Albania. It contributes to the challenge of cultural norms and attitudes that perpetuate violence, as well as holding offenders accountable for their crimes. Findings from research can also help with lobbying and public campaigns aimed at promoting gender equality and reducing violence.

2. PATTERNS AND PREVALENCE OF GEOGRAPHICAL GENDER BASED VIOLENCE: LEGAL, SOCIAL, POLITICAL AND CULTURAL FACTORS

The literature on GGBV is quite intensive and integrates several theoretical perspectives. According to the intersectionality hypothesis, people's experiences with violence are shaped by the intersection of their various social identities, including their gender, color, class, ethnicity, sexual orientation, and geographic location. GGBV happens in certain geographic situations where overlapping identities fuel particular kinds of prejudice and violence (Hawkesworth, 2003). In that line, the Social Ecological Model argues that social, interpersonal, and individual levels of influence all interact to shape a person's experiences (Bronfenbrenner, 1994). They highlight the significance of addressing GGBV simultaneously at various levels, including personal attitudes, societal norms, and institutional regulations.

The critical perspective of Feminist theory points to the power disparities and patriarchal norms that support violence against women and other oppressed genders, through which to evaluate GGBV. It emphasizes how important it is to recognize instances of gender inequality and take action to address them, as well as to advocate for women's rights and promote gender parity. The interconnections of gender, geography, and power dynamics are also examined from a feminist perspective, revealing how spatial dynamics support the continuation of GGBV (Edwards, 1987).

The geographical dimensions of GGBV are explored through spatial analysis, which looks at how urban-rural divisions, resource access, geographic isolation, and cultural norms all affect violence in different ways. It entails mapping the locations of GGBV occurrences, locating hotspots, and examining spatial correlations and patterns. Interventions and strategies can be created to focus on particular regions and people by studying the spatial distribution of GGBV (Valentine, 1998).

Power and control theory, which has its roots in the study of domestic violence, looks into the dynamics of power and control in violent relationships. When this theory is applied to GGBV, it acknowledges that those who commit acts of violence utilize spatial tactics to exert power and

control over their victims. These tactics include restricting their mobility, isolating them physically, and taking advantage of spatial weaknesses. For the creation of successful prevention and intervention measures, it is essential to comprehend the spatial dimensions of power and control (Collett & Lizardo, 2009).

Studies have shown that there are considerable regional variations in the prevalence and types of GGBV. According to research by Stöckl et al. (2013), rates of intimate partner violence varied greatly by region, with higher numbers found in South Asia and Sub-Saharan Africa. Additionally, Caputi et al. (2019) spatial analysis showed the concentration of various forms of violence in particular communities or regions, illuminating the geographic concentration of GGBV. Clustering aids in efficiently directing interventions and resources while offering insights into localized trends (Watts & Zimmerman, 2002).

The persistence of GGBV is significantly influenced by sociocultural variables. Cultural norms, socioeconomic conditions, legal frameworks, and levels of gender equality are just a few of the many variables that affect how common GGBV is in different parts of the world (Jewkes et al., 2015). Fulu et al. (2013) looked at cultural attitudes around intimate partner violence and how GGBV may be influenced by notions of male superiority, female submission, and acceptance of violence as a method of control. Connell's (2014) study on masculinities studies emphasized how cultural notions of masculinity and femininity influence power relationships and lead to GGBV. The subordination of women and the normalization of violence are both a result of these systems' reinforcement of power disparities and hierarchical gender relations.

Beyond the initial physical impact, GGBV has long-lasting effects on survivors' general health and socioeconomic standing. Violence, according to Ellsberg et al. (2008), has a significant impact on women's mental health, resulting in increased rates of depression, anxiety, and post-traumatic stress disorder among women. Economic repercussions were also emphasized, with GGBV restricting women's access to financial independence, career opportunities, and education (Campbell et al., 2002; Devries et al., 2013).

It is essential to comprehend the extensive effects of GGBV to create comprehensive and survivor-centered remedies. Effective treatments should aim to prevent and lessen the detrimental effects of GGBV on individuals and communities while also addressing the economic, psychological, and physical needs of survivors. Key approaches for Addressing Geographical Gender-Based Violence discussed in the literature involve legal reforms and policy interventions (Bunch et al., 2020; Kyegombe et al., 2014), Community-Based Initiatives (Cohen & Nordås, 2015), Education and Awareness Campaigns (UN Women) and Support Services for Survivors (Colombini et al., 2017).

3. CASE STUDY OF ALBANIA

Domestic violence patterns in Albania were perpetuated by multiple layers of silence. Firstly, it is the prevalent culture of silence among abused women themselves, as they learned to survive by suppressing their voices. Fear of retaliation, shame, and cultural acceptance of violence against women further reinforced their silence (Kelly, 1988; Kelly & Radford, 1996; Levy, 1995). Secondly, the political regime in Albania, which isolated the country from the rest of the world for nearly 50 years (1944-1990), enforced another layer of silence regarding domestic violence and other social issues. Public acknowledgment and discussion of family and social

problems were taboo, despite the existence of government-sponsored women's groups focused on women's welfare (Meria, 1995).

With the fall of the Communist government in 1991, new civil society organizations found the freedom to discuss and study violence and social issues in Albania. Various women's groups began collecting information to understand the nature and prevalence of violence against women. First data dictate high numbers of cases of physical violence within intimate relationships, (46.3% of cases reported by rural women and 36.3 % by urban ones). Unemployed women and housewives (respectively 52.7% and 55.7%), reported the most episodes of physical aggression among the major groups. However, it is worth noting that the reported rates might not fully represent the extent of violence, as conservative social norms in rural areas often deter women from admitting their experiences (Meria, 1995). According to another research, 20% of women reported being forced into having unwelcome sex, with rates greater in rural than in urban regions (28.3% vs. 16.4%). Intimate physical violence was also observed to occur often among women, with rural women experiencing it more frequently (46.3%) than their urban counterparts (36.3%). Housewives (55.7%), agricultural workers (58.1%), and unemployed women (52.7%) were more likely to report physical abuse.

In an interview-based research, 28% of women claimed that domestic violence was an expected part of marriage, recalling how it had happened to their mothers and persisted in their own lives. While acknowledging its inevitable nature, they nevertheless voiced a desire to shield their girls from it. A common theme among responders was blame and shame, with some women (25%) holding themselves or other women responsible for the violence. They attributed the abuse to their inability to meet expectations, such as not having things ready on time or not adhering to their husbands' preferences. Another group (10%) believed that women could deserve violence in cases of infidelity, neglecting their children, or mistreating in-laws. 38 percent of women linked the violence to outside causes including alcohol, unemployment, stress, and a lack of resources. Similar sentiments regarding gender violence were found in a separate survey done among students at the University of Tirana, but more students voiced resistance to it (Haxhiymeri, 1996).

Violence had a severe negative effect on both the children of the victims and the mothers who experienced it. Low self-esteem, feelings of worthlessness, and even suicidal thoughts were expressed by the women. They saw violence as an inevitable part of their mothers' lives and accepted it in their marriages without seeing any other options save trying to lessen its suffering. In severe circumstances, 3% of women motivated by the need to protect their children, killed their violent husbands and were sentenced to prison. They experienced isolation and a lack of community support in their search for alternatives. Mother-child relationships were also impacted by the violence, with mothers showing their children disrespect and impatience while also acting more aggressively and pessimistically about the future. According to interviewed teachers, the children's lack of interest in school and the appearance of parental neglect demonstrate that violence has a bad impact on their well-being.

Rural Albanian women continued to participate in public spheres despite historically more restrictive gender norms in rural areas because of the communal character of farming. However, due to patriarchal cultural standards that define women as property and place limitations on their rights inside the family, rural women have few options to leave their husbands and farm independently. The likelihood of violence against women is increased by this pattern of ownership and dominance over them. To raise their status and increase their opportunities for a better life, fathers may promote their daughters' access to jobs and education.

Despite the 40 years of communist rule in Albania from 1946 to 1991, the deeply ingrained patriarchal attitudes persisted, including those influenced by the Kanun of Lek Dukagjini, which held relevance in certain regions of Albania. Some individuals in these areas still use the Kanun to justify their attitudes and beliefs regarding gender roles and patriarchal authority, including the notion of a man's right to "discipline" his wife, who is viewed as his property.

Following the fall of communism in 1991, the newly established Government of the Republic of Albania ratified several significant international conventions. Albania has enacted several legislative measures to safeguard victims of gender-based violence. Additionally, it has ratified the Istanbul Convention (Council of Europe Convention on Preventing and Combating Violence against Women and Domestic Violence) and the Convention on the Elimination of All Forms of Discrimination Against Women (CEDAW), two international human rights instruments that address gender-based violence and protect women's rights. According to the Global SDG database of UN Women from 2020, the national legislative framework meets 91.7% of the overall GBV-related legislative frameworks; 70% of the overall employment and economic empowerment legislative frameworks; and 90.9 percent of the overall family and marriage legislation. Domestic violence prevention and victim protection were for the first time specifically addressed through the law "On Measures against Aggressive Behavior at Home", which entered into force in 2007. According to it, all family relations are subject to protection and civil courts can quickly issue "protection orders".

When it comes to socio-economic development, men typically enjoy higher employment rates across all educational levels. Whereas women, particularly those with upper secondary and non-higher post-secondary education, have less job chances (INSTAT, 2020). Referring again to data from the Global Gender Equality Index, gender differences are more noticeable in the distribution of unpaid care and household duties (48.1/100) and less present in access to health-care (81.8/100). In addition, gender parity in education (55.6/100) needs further attention. To advance gender safety and equality, these gaps must be addressed.

4. EMPIRICAL DATA COLLECTION

The study method's geographical approach allows for an examination of the spatial elements of gender-based violence, which can reveal contextual subtleties, regional variances, and localized dynamics. All the participants lived in Durres, the second most important city in Albania after Tirana, the capital city. Durres was selected because it continues to remain one of the cities with the highest figures of domestic violence and low public awareness.

In total, 40 participants were selected randomly in one neighborhood (L6, Street Veli Xhymerti) whose familiarities are known to have experienced gender-based violence. This neighborhood was selected because it is also inhabited by people of various categories living in the surroundings. Participants are recruited using a variety of methods, including internet platforms, social media, email invites, and in-person distribution. The survey includes multiple-choice questions that allow participants to choose their preferred response. If requested, it offers open-ended text areas for participants to give additional comments or descriptions. To promote honest and fair replies, the survey is anonymous and confidential.

Given that 60% of respondents identified as female, 35% as male, 3% as non-binary, and 2% decided to withhold their gender, the survey's findings show a wide spectrum of gender identities. Furthermore, there is a considerable disparity in the participants' age distribution. The 25–34

age range has the largest group at 35%, followed by the 18–24 age range at 25%, and the 35–44 age range at 20%. This demographic variety suggests a wide range of perspectives and life experiences because it includes contributions from both younger and middle-aged people. The results of the survey are therefore more inclusive and representative.

85% of participants believe that patriarchal structures and prevalent gender norms are to blame for the persistence of violence. This sizeable number shows that respondents' opinions on the critical role that societal norms and gender expectations play in both creating and maintaining violence are largely in agreement. Participants in the study mentioned many variables that they believed contributed to violence in situations where patriarchal systems were present. These factors include male-dominated political systems, income disparities based on gender, restrictive gender norms, underrepresentation of women in leadership positions, barriers to women's access to higher education and economic prospects, and harassment and bias based on gender. These findings highlight the complex relationships across various organizations and systems that support violence, emphasizing the need for all-encompassing efforts to solve these problems.

Participants in the survey acknowledged that gender norms encourage harmful masculinity expressions, uphold traditional gender expectations, put pressure on people to follow predetermined gender roles and support gender-based power imbalances. Overwhelmingly, 80% of respondents noted that toxic masculinity may lead to negative outbursts of anger and dominance, which may, in turn, encourage violent behavior. Additionally, 75% of respondents acknowledged the burden of adhering to established gender roles, which may cause discontent and conflict. Furthermore, 70% of respondents pointed out how gender norms support stereotypes that limit personal autonomy and uphold unequal power dynamics. Finally, 65% of respondents emphasized how gender norms could encourage violence by maintaining power imbalances.

Survey responses suggest a variety of strategies to address these issues, including pushing for gender parity, challenging traditional gender roles and stereotypes, enlisting men as allies, ensuring women's participation in decision-making processes, strengthening legal frameworks, and promoting awareness and education. These perspectives provide insightful information about potential strategies for creating a more equitable society free of violence.

40% of respondents admitted to having personally encountered such incidents of violence resulting from patriarchal systems and gender norms, highlighting the substantial impact that these systems and norms have on people's lives. The fact that an even higher percentage, or 55%, said they have seen such violence highlights how pervasive these problems are in society. These observations cover instances of gender-based bias, domestic violence, harassment, and discriminatory behavior, all of which highlight how prevalent these structures and practices are throughout diverse communities and cultures.

The survey results show that there is broad agreement among respondents that gender equality is crucial for reducing violence. Its importance was highlighted by the fact that the majority of respondents gave it a maximum rating of 10, on a scale of 1 to 10.

A significant 85% of respondents agreed that cultural ideas and practices do in fact contribute to gender-based violence (GBV) when asked about the impact of cultural beliefs and traditions on GBV. This highlights the participants' understanding of how cultural traditions and norms influence societal expectations and gender-related behaviors.

Survey participants pointed out various ways in which cultural beliefs and traditions impact gender-based violence (GBV). Among them, 75% recognized that perpetuating traditional gender roles and expectations plays a role in fostering violence. Furthermore, 60% believed that cultural beliefs and traditions tend to normalize violence as a means of conflict resolution, and 70% acknowledged that the acceptance of male dominance and control over women contributes to GBV. These findings underscore the intricate relationship between culture and GBV.

Specific cultural beliefs and traditions that respondents identified as contributing to GBV include incidents like dowry-related violence, female genital mutilation/cutting, honor killings, forced marriages, victim-blaming, shaming, and customs that promote gender inequality. These results emphasize the need to address cultural norms and practices as a crucial step in effectively preventing and combatting GBV.

70% of those surveyed agreed that certain cultural features should be carefully considered and modified in order to effectively prevent gender-based violence (GBV) while also respecting them. This opinion was given in relation to the topic of dealing with cultural beliefs and customs. This suggests that in order to effect long-lasting change, significant adjustments must be made to deeply ingrained norms and traditions.

Participants also suggested a range of approaches to combat GBV that respect cultural values and customs. These tactics include working with local leaders and elders, adjusting education and awareness campaigns to particular cultural contexts, partnering with cultural and religious organizations, and giving women and girls more access to possibilities in the workplace and in education. These tactics show how to manage GBV holistically while taking into account cultural circumstances.

The data also discloses that a substantial portion of respondents in Durres personally encountered instances of gender-based violence, underscoring the prevalence of this problem within the city. Streets and public spaces (50%) and public transportation (40%) emerged as the areas where women felt the least secure, and most had either witnessed or been aware of gender-based violence incidents in the city.

Furthermore, the survey participants emphasized the significance of local authorities addressing gender-based violence in Durres, as evidenced by an average rating of 8.5 out of 10. This points to a strong consensus on the importance of municipal governments taking action against gender-based violence, highlighting the necessity for effective interventions and support services.

However, according to 50% of respondents, Durres does not provide enough resources and support services for victims of gender-based violence. This emphasizes the need to improve the infrastructure for services and assistance to effectively address the requirements of survivors. The significance of bettering resources and services to better address gender-based violence in the city is highlighted by these statistics.

5. CONCLUSION

The study emphasizes the crucial importance of sociocultural variables in maintaining gender-based violence within Albanian society, such as conventional gender roles, patriarchal standards, and family expectations. Survivors of gender-based violence in the Albanian community

frequently endure stigma and shame, which leads to underreporting of occurrences and hurdles to seeking aid and support.

The research demonstrates that community people are unaware of the nature, scope, and repercussions of gender-based violence. Engaging community leaders, religious organizations, and elders in addressing the issue can assist in challenging harmful conventions and foster collective accountability. To close the knowledge gap, focused education, and awareness efforts are required.

Policies and interventions should take these overlapping identities into account and strive toward inclusion. The study technique acknowledges the intersectional character of gender-based violence, considering how different types of social injustice cross and contribute to violent experiences. Furthermore, it underlines the need to use a trauma-informed approach while delivering support services to survivors. Understanding the effects of trauma, establishing safe and empowered settings, and providing holistic care are all part of this. This can be achieved through collaboration and networking across organizations, non-governmental organizations (NGOs), and service providers working on gender-based violence in the Albanian community. Sharing resources, knowledge, and best practices can improve intervention efficacy. Beyond that, it is critical to integrate a long-term approach focused on education, youth empowerment, and altering social norms. Engaging young people in school-based programs and community efforts can help them develop positive attitudes and behaviors.

The study recommends a process of continuous data collection and research as a requirement to track the prevalence and trends of gender-based violence in the Albanian community. Policy-makers and practitioners may establish targeted initiatives that address the core causes and encourage prevention by studying the geographical patterns, risk factors, and contextual dynamics of gender-based violence. The findings of the study contribute to evidence-based policy creation, such as awareness campaigns, community mobilization, and legislation reforms, supporting holistic approaches to reducing gender-based violence.

The majority of respondents recognized the significance of patriarchal systems and gender norms in sustaining violence. This indicates a growing knowledge and comprehension of the structural variables that lead to violence, particularly those related to gender. Respondents stressed the necessity of attaining gender equality in the fight against violence. There is a common opinion that increasing gender equality is an important step toward reducing violence, particularly gender-based violence. This emphasizes the importance of questioning cultural norms and power systems that perpetuate gender inequity. There was a modest gender imbalance in the survey sample, with a larger number of female respondents compared to male and non-binary respondents. In order to have a full grasp of the problem, future studies should include a fairer mix of various genders and backgrounds.

Mapping the spatial distribution of gender-based violence occurrences aids in the identification of high-risk locations and geographical clusters. This data helps central and local governments and service providers to better allocate resources and target interventions where they are most needed. Interventions can be tailored to meet the distinct problems and vulnerabilities prevalent in various locales by focusing efforts on specific geographic areas.

These findings highlight the necessity of using a geographical research technique to acquire a thorough knowledge of gender-based violence, guide targeted interventions, and support evidence-based legislation.

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