Varazdin Development and Entrepreneurship Agency and **University North, Croatia**
in cooperation with
College of Letters, Arts, and Sciences, Metropolitan State University of Denver, USA
Faculty of Economics and Business, University of Maribor, Slovenia
Faculty of Management University of Warsaw, Poland
Faculty of Law, Economics and Social Sciences Sale - Mohammed V University in Rabat, Morocco
Ecole Nationale de Commerce et de Gestion de Tanger - Abdelmalek Essaadi University, Morocco
Medimurje University of Applied Sciences in Cakovec, Croatia
GOVCOPP - University of Aveiro, Portugal

Book of Proceedings
Special Issue

Modern Trends in Economic and Social Development

Editors:
Nicholas Recker, Brian O'Hara, Petar Kurecic, Jernej Belak, Karin Sirec

Selected Papers:

116th esd Conference
Hosted by: College of Letters, Arts, and Sciences, Metropolitan State University of Denver, USA

117th esd Conference
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This book contains selected papers from two international scientific conferences: the 116th "esd" conference in Denver, USA, and the 117th "esd" conference in Maribor, Slovenia. Both conferences also served as the official introduction of our two new Partners: the College of Letters, Arts, and Sciences at Metropolitan State University of Denver, USA, and the Faculty of Economics and Business, University of Maribor, Slovenia. The main topic of the roundtable at the Denver conference was "Inclusive Development for Robust Organizations and Resilient Societies," while in Maribor it was "Contemporary Opportunities and Challenges for a Sustainable Global Economy." These were also the fourth and fifth "esd" conferences since early June 2024, when we suddenly lost "esd Conference" Founder and Scientific Committee President, Professor Marijan Cingula.

Domagoj Cingula, Organizing Committee President

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116th International Scientific Conference on Economic and Social Development

Denver, USA, 11-12 October 2024

THE INTERSECTION OF ARTIFICIAL INTELLIGENCE AND GREEN FINTECH: A PRISMA COMPLIANT ANALYSIS AND LITERATURE REVIEW – A BIBLIOMETRIC STUDY

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ABSTRACT

The subject and application of Artificial Intelligence (AI) are ever-growing and emerging in various industries and research areas. In the light of the ongoing global initiative for sustainable development of the global economy, it is vital to dive into the topics of green finance, sustainable finance and FinTech, as well as their intersection with AI. In this study, the main objective is to survey the globally renowned Scopus scientific database in search of all the published papers with no limitation to time of publication and paper type, in order to identify the trends, hotspots, potential future directions and most contributing countries, authors and affiliations on this subject. For this purpose, papers within the Scopus scientific database were used to gather information on the research topic which shows the main trends, findings, affiliations and authors that focused on the intersection of AI and green/sustainable finance and FinTech. In turn, the findings have important practical and academic implications and reveal the hotspots and trends in the use of Artificial Intelligence in green finance in general. This article is the first to conduct a comprehensive bibliometric analysis of 158 articles dealing with the application of AI in green finance-related issues in the period 2013–2024, with the application of the keywords "green fintech" or "green finance" or "sustainable fintech" or "green financial technology" and "Artificial Intelligence". This could further expand this already topical subject, as there is a growing interest in incorporating AI in all finance and all financial sectors globally. Therefore, this study could represent a stepping stone in this direction.

Keywords: *Artificial Intelligence, bibliometric review, fintech, green finance, sustainability, sustainable fintech.*

1. INTRODUCTION

Artificial intelligence (AI) is a term that is used for defining transformative technology with far-reaching implications across multiple domains. It is a topical and very contemporary subject that emerges in various industries and subject areas. Moreover, Artificial Intelligence has „immense importance in today's world and has the potential to alter our future in various

domains, and its importance lies in its ability to automate tasks, enhance decision-making, personalize experiences, solve complex problems, and drive innovation“ (Siddiqui et al., 2024). Considering the topicality of sustainable and green finance globally as well, the intersection between AI and green finance/ sustainable FinTech practices was a logical step for this study. The application of Artificial Intelligence in green finance has already been explored in several papers. In the studies of Hemanand et al. (2022) and Yang (2020), the potential of AI has been highlighted in light of its promotion of green finance development.

There is also a recognized need for a further digital upgrade in green finance, with AI being the key player in this transformation (Trukhachev & Dzhikiya, 2023). Moreover, Zhang (2020) has presented a more comprehensive overview of the historical development of AI, including its modest application in finance thus far. These studies collectively reveal the significant potential of AI in advancing green finance, as well as its thus far efforts to its promotion. This bibliometric literature review has been conducted with the application of the keywords “green fintech” or “green finance” or “sustainable fintech” or “green financial technology” and “Artificial Intelligence” in the Scopus database. An in-depth analysis and visualization of bibliometric data has been performed related to 158 articles that include the main keywords of conducted analysis which were published from 2013 to 2024 (May). Therefore, the main goal of this paper is to explore the application of AI in green finance and green FinTech concept. This article is structured as follows. Section 2 encompasses the theoretical background on sustainable/green financial technologies and AI. The third section presents the methodology. Section 4 revolves around the results. In this section, the research approach, publication years, document types, keywords analysis, authors and affiliations analysis are presented in detail. Section 5 includes the discussion, implications, limitations, future trends and concluding remarks for AI in green finance applications.

2. THEORETICAL BACKGROUND

In this section, a theoretical background on green and sustainable finance and financial technologies (FinTech) and Artificial Intelligence (AI) is given as follows.

a. Sustainable/green financial technologies (FinTech)

FinTech is a contraction of “Financial technology” referring to technology-enabled financial solutions (Arner et al., 2015). Even though its development has been rather rapid, especially in the past few decades, its emergence could be regarded as rather a complex process, which was influenced by a range of economic and technological factors. The latest era of FinTech evolution is characterized by the application of „rapidly developing technology at the retail and wholesale levels“ (Arner et al., 2015). However, considering the ever-growing importance of ESG (Environmental, Social and Governance) issues worldwide, there is a rapid development of the so-called sustainable or green financial technologies.

Namely, many authors claim that green FinTech could successfully address shortcomings in sustainable finance, such as „improving ESG disclosure and retail access“ (Macchiavello & Siri, 2022). Moreover, there are many published case studies that present successful applications of FinTech in sustainability promotion (Shih et al., 2023; Chueca Vergara & Ferruz Agudo, 2021). There is a vast potential for FinTech to contribute to improving the sustainability and overall performance of organisations in the finance sector.

b. Artificial Intelligenge (AI)

The foundations of AI are found in „computer science, linguistics, psychology, mathematics, and philosophy“ (Tadapaneni, 2019). Artificial intelligence (AI) is defined as „a group of related technologies that include machine learning (ML) and deep learning (DL)“ and is believed to have the potential to disrupt and quickly and very successfully transform the global financial services industry (Buchanan, 2019). Moreover, AI technologies have been established as powerful tools used in the financial services industry (Tadapaneni, 2019). Artificial intelligence (AI), is considered „a key technology in the 2010s, that has become a dominant technology in the 2020s“ (Hilpisch, 2020). However, some authors are genuinely concerned about the excessive employment of AI and its effect on society, „especially regarding essential human rights like religious freedom“ (He, 2024) and emphasizing the „potential role that digital tools can play in supporting ethical decision-making processes“ (Sleigh et al., 2024). Therefore, it is vital to use AI ethically and responsibly and more importantly, to promote sustainable and responsible use by corporations globally. In this study, the intersection between AI and green fintech is tackled, in order to gain new insights and to map out the trends and hotspots in this research area.

3. METHODOLOGY

The methodology chosen for this bibliometric review and analysis was the PRISMA-guided systematic literature review. The Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) statement was first published in 2009 and later modified in 2020. PRISMA includes a 27-item checklist and four-phase flow diagram that have become the „hallmark of academic rigour in the publication of systematic reviews and meta-analyses“ (Sohrabi et al., 2021). Moreover, PRISMA represents „a reporting guideline designed to address poor reporting of systematic reviews“ (Page et al., 2021). The main objective of the PRISMA guidelines is „to increase the clarity, transparency, quality and value of literature reviews (Liberati et al., 2009). The modifications of PRISMA in 2020 intended to „encompass new reporting guidance that „reflects advances in methods to identify, select, appraise, and synthesise studies“ (Page et al., 2021). Sohrabi et al. (2021) tackle the issue of adoption of the updated PRISMA 2020 statement and its potential strengthening of the „transparency, consistency, and completeness of the reporting of systematic reviews“.

As shown in Table 1, the research strategy of this study was to include all the published papers thus far in the Scopus database that revolved around the issues of Artificial intelligence and green finance. After manually surveying the Scopus database and initially investigating this subject, the authors concluded there is a need to encompass more than one keyword/key phrase for the issue of green finance, in order to include all the relevant published papers. In this sense, the authors agreed upon the use of the following keywords: “green fintech” or “green finance” or “sustainable fintech” or “green financial technology” and “Artificial Intelligence”. There were 587,487 papers published on Artificial Intelligence since 1911, and when the refinement keywords were used (as stated above), a total of 158 papers appeared, and these were subject to this bibliometric analysis.

Table 1. The research strategy in the Scopus database.

Search strategy	Hits	Time span	Indexes
TITLE-ABS-KEY ("Artificial Intelligence (AI)"	581,487	1911 – May 2024	Scopus
Refined by: search within all fields: green finance, green fintech, sustainable fintech, or green financial technology	158	2013 – May 2024	Scopus

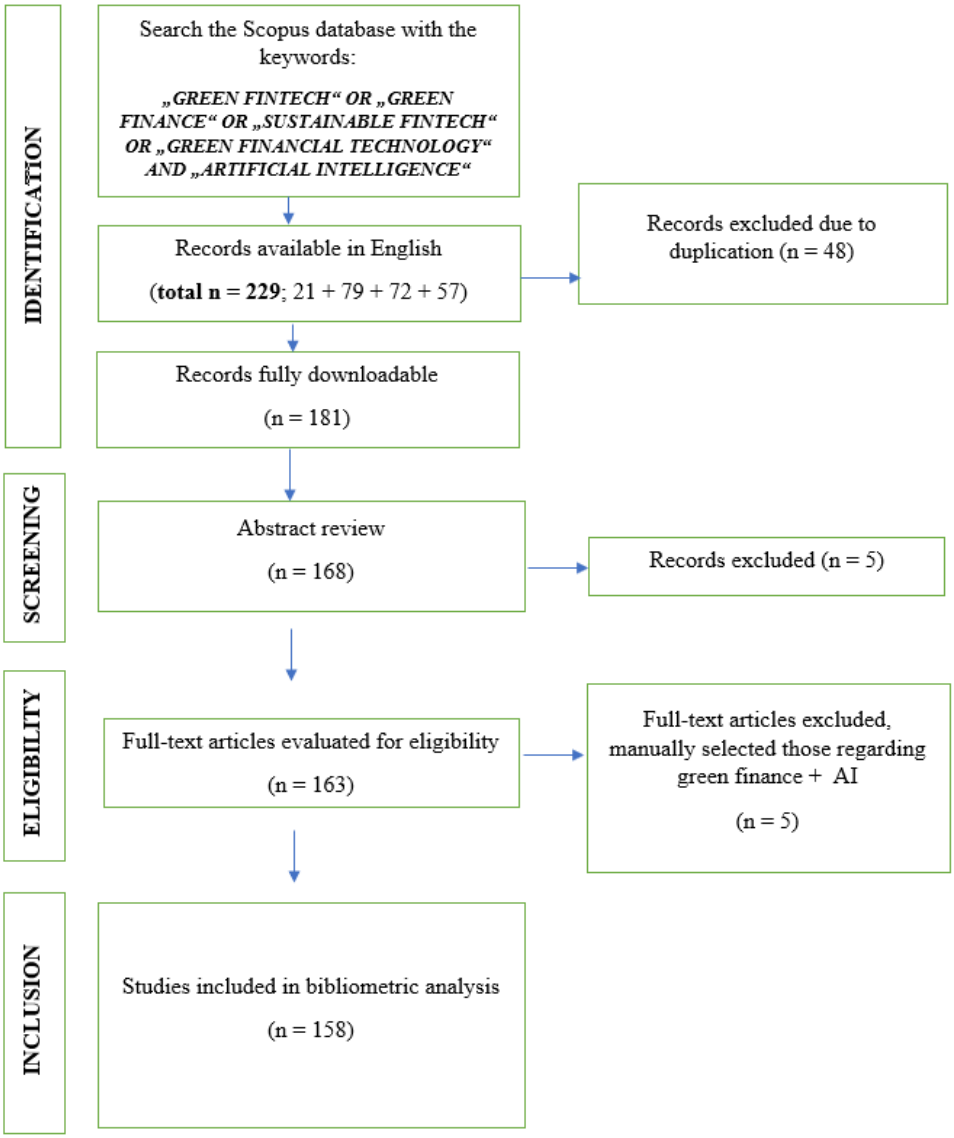
Source: Authors' work

The systematic literature review conducted in this study included the four phases and steps of the PRISMA guidelines. As shown in Figure 1, the four steps were identification, screening, eligibility and inclusion phase. In the first (i.e. identification) phase, the Scopus database was surveyed with the combination of keywords: "Artificial Intelligence" AND "green fintech" or "green finance" or "sustainable fintech" or "green financial technology". This led to a total of 229 papers, i.e. 21 papers with the keywords „Artificial Intelligence" + "green fintech"; 79 papers with the keywords „Artificial Intelligence" + "green finance"; 72 papers with the keywords „Artificial Intelligence" + „sustainable fintech"; and 57 papers with the keywords „Artificial Intelligence" + "green financial technology".

The records that were duplicated were eliminated in this step (there were 48 papers duplicated among these searches). This first phase ended with 181 papers that were fully downloadable and open access. These papers entered the second stage (phase), i.e. the screening phase. In this stage, the authors manually reviewed and screened the abstracts, and excluded 5 papers from this stage as inadequate for the research subject. The next, third stage (i.e. the eligibility stage) included 163 papers, and in this stage, 5 papers were excluded that were not relevant to the research subject at hand. The last, inclusion stage included 158 papers that were screened and identified as eligible for the research study (AI + green finance / sustainable FinTech).

Figure following on the next page

Figure 1. The selection process of the papers for the bibliometric analysis



Source: Authors' work

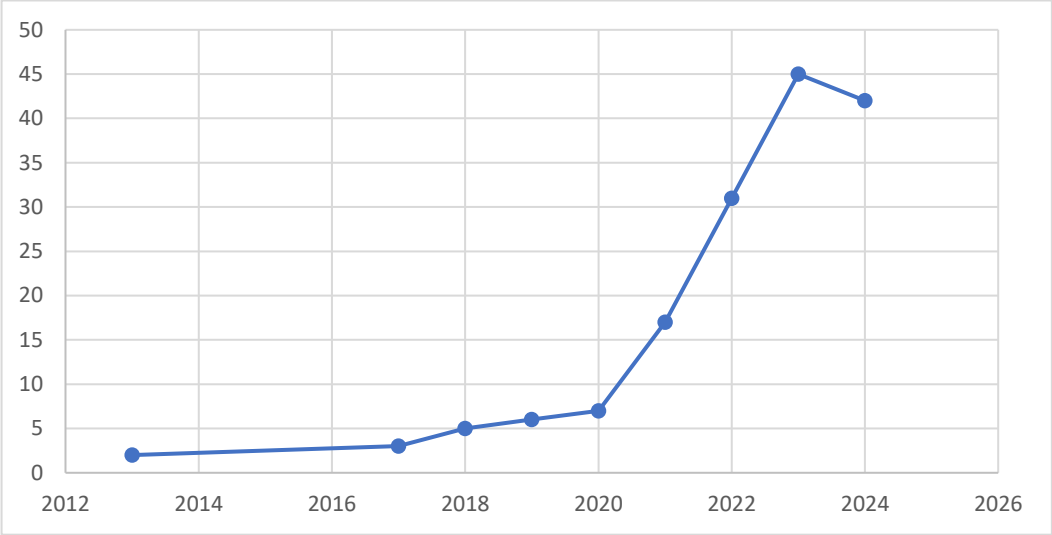
4. RESEARCH RESULTS

In this section, an in-depth analysis of the publication years, the document types and keyword analysis is presented, together with the most contributing affiliations regarding the application of Artificial Intelligence (AI) in green/sustainable finance/FinTech concept and most contributing countries (i.e. countries with most affiliations and publications regarding green finance/FinTech and AI.

4.1. Publication Years, Document Types, and Keywords Analysis

In Figure 2, a graph of publication years for the surveyed 158 papers is given. The rise of published papers is obvious after 2020, the highest in 2023 and expected to rise as well in 2024. Table 2 reveals all the crucial information regarding the conducted literature review, i.e. the sources (how many of these 158 papers are articles, books, reviews etc.), authors (what is the total number of authors of these papers as well as the information regarding the authors of single-authored documents and the number of authors per document), documents content (authors keywords) and affiliations (the number of different affiliations and different countries).

Figure 2. Publication years



Source: Authors' work

Table 2. Main information of the literature review.

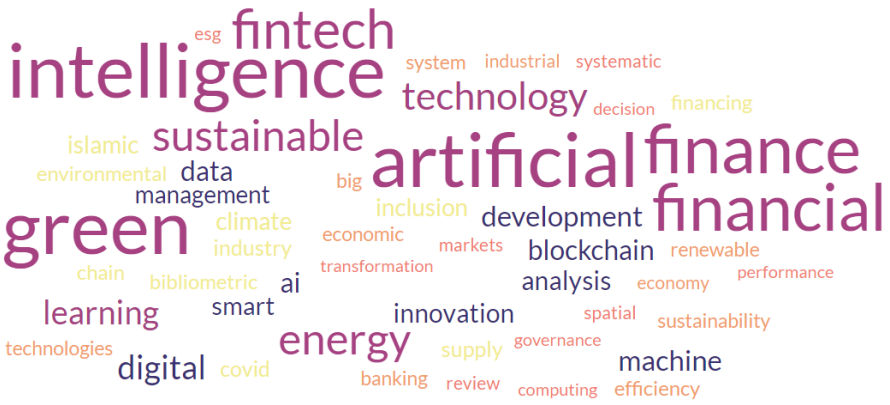
(n = 158)		
Timespan		2013 - 2024
Sources		
	Books	11
	Book chapter	34
	Editorial	4
	Conference paper	25
	Review	9
	Article	75
Authors		
	Authors	490
	Authors of single-authored documents	36
	Authors per document	3.1
Document content		
	Author's keywords	1359
	Index keywords	2503
	All Open access	44
Affiliations		
	Different affiliations	453
	Countries	60

Source: Authors' work, inspired by Correia et al. (2024)

Thereafter, a word cloud was conducted, which is shown in Figure 3. A word cloud of AI literature regarding its application in green finance concept is based on the most popular keywords.

This simple analysis and tool have proven that the search strategy of this article has been chosen correctly as the most popular keywords and key phrases, which appear in the word cloud of AI and green finance / FinTech also appear in the search keywords.

Figure 3. Word cloud of the most mentioned authors' keyword of AI literature and green finance concept



Source: Authors' work

Table 3. shares valuable information regarding the literature review. Namely, it reveals the countries/ territories with the most publications regarding the employment of AI technologies in green finance and green FinTech (which are India, China and the USA), as well as the institutions/organizations with the highest number of publications (which are Amity University, India, Graphic Era Deemed to Be University, India and San Jose State University, United States of America).

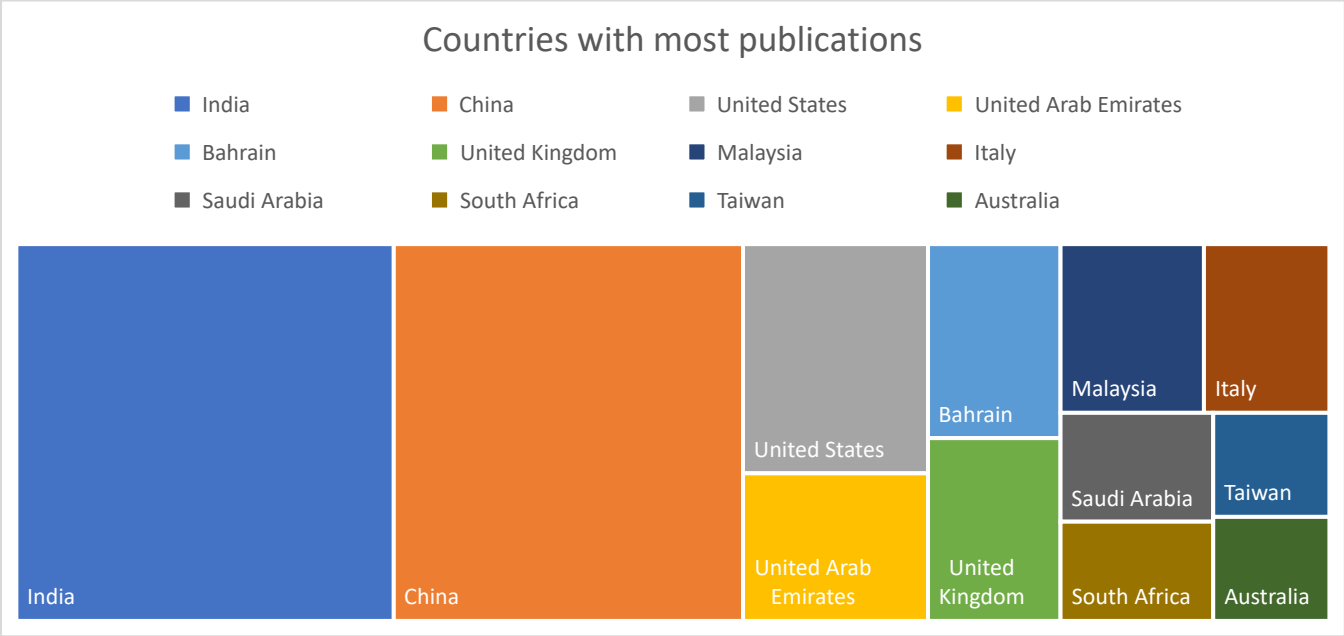
Table 3. Contributing affiliations regarding the application of Artificial Intelligence (AI) in green/sustainable finance/FinTech concept.

Countries/Territories	**Number of publications**	**Organizations/Institutions**	**Number of publications**
India	94	Amity University, Uttar Pradesh, India	5
China	87	Graphic Era Deemed to Be University, Dehradun, India	4
United States	28	San Jose State University, San Jose, United States	4
United Arab Emirates	18	Jain University, Bangalore, India	2
Bahrain	17	Islamic Azad University, Najafabad, Iran	2
United Kingdom	16		
Malaysia	16	Kairouan University, Kairouan, Tunisia	2
Italy	14	University of Palermo, Italy	2
Saudi Arabia	11		
South Africa	10		
Taiwan	8	Xian University of Architecture and Technology, Xian, China	2
Australia	8		

Source: Author's work

Furthermore, Figure 4 reveals the countries with the most affiliations and publications regarding green fintech and AI, by presenting them in a graphically convenient figure.

Figure 4. Countries with the most affiliations and publications regarding green fintech and AI



Source: Authors' work

5. DISCUSSION AND CONCLUSION

The subject of AI is a very topical and contemporary subject that has gained a lot of attention from various academic members, scientific fields and industries. Moreover, the issue of ethical and sustainable (green) employment of AI technologies is regularly highlighted. Therefore, the intersection of AI and green finance is tackled in detail in this study. The main objective of the bibliometric review was to explore the application of AI in green finance and green FinTech concept by surveying the globally renowned Scopus scientific database in search of all the published papers with no limitation to time of publication and paper type, in order to identify the trends, hotspots, potential future directions and the most contributing countries, authors and affiliations on this subject. For this reason, the Scopus scientific database was surveyed with the keywords (i.e. the combinations of keywords) as follows: "green fintech" or "green finance" or "sustainable fintech" or "green financial technology" and "Artificial Intelligence". The main findings reveal rather interesting new insights. First and foremost, the number of publications in this research area is rising after 2020. It is expected that this research field will gain even more attention in the following years. Second, the countries/ territories with the most publications regarding the employment of AI technologies in green finance and green FinTech are India, China and the USA, and the institutions/organizations with the highest number of publications are Amity University, India, Graphic Era Deemed to Be University, India and San Jose State University, United States of America. Last, but not least, there were 453 different affiliations and 490 authors from 60 countries. Only 36 out of 158 papers are single-authored documents and the average authors per document is 3.1.

This shows the large portion of international collaboration between authors from different affiliations and different countries, which is considered a major success in international

scientific research and a major benefit for the academic community. This study, however, is not without limitations. Even though three researchers/authors conducted the content analysis for the surveyed 158 papers, the relevance criterion is somewhat subjective. Second, there is a possibility that not all relevant published studies were encompassed and included in the study. Namely, the surveyed papers were indexed in one of the globally most renowned databases (i.e. the Scopus database) and there is a possibility that a relevant study had been published elsewhere and not indexed in this database, thus these studies were not included in the study. In conclusion, there are vast opportunities for future exploration and application of AI in the investigation of green finance and green FinTech practices. This bibliometric study sheds light on the current trends, hotspots and applications of AI in green finance-related issues. Therefore, this study could potentially serve as a stepping stone for future research efforts and a bigger application of AI in green finance-related issues. In future work, the authors plan to empirically evaluate the AI tools implemented by Croatian commercial banks and thus, raise awareness among the academic community regarding the application of AI tools in the exploration of green finance practices.

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THE FUTURE OF ARTIFICIAL INTELLIGENCE IN GLOBAL ECONOMY: CONTRIBUTIONS AND RISKS

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ABSTRACT

Artificial Intelligence has considerably transformed various aspects of human life, including economic structures and the security of financial systems worldwide. Since it has become entrenched in global world affairs, AI is now a part of global economic security in the postmodern sense and a pivotal agent in the Fourth Industrial Revolution, which promises unprecedented economic growth but raise potential challenges and risks. This article will analyze the prospective contributions and risks of AI within economic security, particularly in the context of global inequalities between the Global North and the Global South. The analysis is based on the Copenhagen School security typology and focuses on one major security sector as divided by the school. It explores the contributions and risks of AI to economic security by examining how AI affects the global economy, its potential for both growth and disruption, and the security concerns it raises for individuals, institutions, and nations. Some of the main questions that this article strives to answer is: How can AI promote regional and global efforts towards the achievement of the United Nations Program's on Sustainable Development Goals within the 2030 Agenda? Can AI widen the developmental gap between the Global North and Global South?

Keywords: *Artificial Intelligence, Disparities, Economic Security, Global North, Global South.*

1. INTRODUCTION

Artificial Intelligence (AI) has emerged as a driving force reshaping the future of global affairs. Its intersection with security has become a significant area of concern. In the world of economics, AI has become a pivotal agent in the Fourth Industrial Revolution, promising unprecedented economic growth yet raising potential challenges and risks. This article will analyze the prospective contributions and risks of AI within economic security, particularly in the context of global inequalities between the Global North and the Global South and based on the Copenhagen School security typology. The analysis focuses on one major security sector as divided by the school. However, it briefly highlights some of the impacts that can reach other interrelated security sectors. The overarching question is whether AI can be a force for stability and growth, or whether it will exacerbate the existing disparities and introduce new vulnerabilities. This analysis strives to answer the following questions: what is the extent of AI contribution to global economic security? How can AI promote regional and global efforts towards the achievement of the United Nations Program's on Sustainable Development Goals within the 2030 Agenda? Can AI widen the developmental gap between the Global North and Global South? What ethical implementations are associated with this potential risk? Can it cause a "migration" of threat? Finally, how can the international community create adaptive and regulatory governance frameworks to mitigate the military, political, societal, economic, and environmental risks? What policy recommendations can help benefit from the positive side of AI?

1.1.The Macroeconomic Impacts of AI:

Studies conducted on the impact of AI on economy and economic security has generated various ideas on how AI and Machine Learning (ML) can influence productivity and growth, business operations, and labor markets in the long term. The use of new technologies in economy is considered to have a positive impact on labor market (Frey & Osborne, 2013), productivity, and business operations due to its ability to collect, store, process, and analyze massive data volumes and perform other tasks, including translation, information retrieval, logistics coordination, report writing, among many others. Pragmatic optimists of this technological revolution focus on productivity and point to the positive impact of AI and ML in boosting productivity and reinforcing economic growth, especially in the United States and China, which is foreseen to reach 1.4 % in the next fifty years. Also, the integration of AI and ML in the global economy will bring about innovation and introduce new factor of production, which will positively influence supply chain and logistics, increase profitability, augment consumption, labor, and capital. (McKensey Global Institute, 2018; Accenture, 2021). So, this means that AI can drive economic growth by increasing efficiency, productivity, and innovation across various sectors. Through advanced data analytics, businesses can make more informed decisions, optimize supply chains, and identify new market opportunities, and this could lead to higher economic output and greater global trade. In addition, AI technologies can contribute to financial auditing and regulatory compliance, reducing the risk of fraud and improving the overall stability of financial markets. By automating mundane tasks and enhancing decision-making, AI can support the development of more resilient economic systems. On the other hand, "Despite the potential positive impact of technology on economic growth, it is nonetheless essential to address its possible negative impact at least in the short term, on the labour market." (Schwab, 2016). The techno-pessimists focus on the impact of AI on the workforce, claiming that reliance on AI in production can create a 'post-Fordist apocalypse' where millions of workers can get laid-off, which can lead to income and consumption decline, and therefore, economic stagnation. This is based on the idea that optimizing the efficiency of production and increasing the profit share of corporations can inevitably decrease the income of labor share, which can lead to societal and political disruption. (Mckensey Global Institute, 2017). Also, governments that rely on income to fund social services may face budgetary shortfalls and this may lead to a crisis in social welfare systems**.** Still, this could be a transformative phase that will require a radical change in training the existing skilled personnel and hiring new employees with relevant competencies. As new industries and sectors emerge thanks to AI innovations, high-skill jobs in AI development, cybersecurity, and digital services may create new job opportunities with higher income and better work conditions. The shift in skill requirements will demand basic changes in education and training, which may take some time but may not last, Schwab notes that, "As human beings, we have an amazing ability for adaptation and ingenuity. But the key here is the timing and extent to which the capitalization effect supersedes the destruction effect, and how quickly the substitution will take." (2016)

1.2. Global North and Global South: Digital Disparities

The disparities between the Global North and the Global South are a live issue in global affairs, and AI may either help to bridge this gap or widen it further. The effect of AI use on the Global South may be far worse that the prospective negative consequences in the Global North.

AI technologies that are mostly concentrated in developed countries can exacerbate the gap between the Global North and the Global South at different levels. This digital discrepancy gives the former a significant advantage in terms of economic growth, military power, and governance capabilities. (Jacques Bus et al, 2012). The Global North can achieve a quantum leap in production and generate larger economic revenues, leaving the Global South grappling with economic and financial vulnerability. The unequal access to AI technologies and expertise between the Global North and Global South can lead developing nations to compete with wealthier countries that have greater resources to invest in AI research and development which may deepen economic dependencies as developing countries become more reliant on foreign technologies and expertise. This could aggravate the existing inequalities and consequently result in more complex security challenges, including insurgencies, irregular migration, cyberattacks, and political instability in the Global South. The benefits of AI are often concentrated in industries and regions with the resources to invest in advanced technology that allows the creation of data-treatment power plants, leaving behind workers and communities that are less equipped to adapt to AI-driven changes. In developed economies, businesses and individuals are more likely to benefit from AI-driven advancements in productivity and innovation. However, in developing economies, workers may find themselves increasingly marginalized as their jobs are outsourced or automated. This widening gap poses a serious threat to global economic security. It risks creating a two-tiered global economy where wealth and opportunities are concentrated in a few advanced economies, while others are left behind, and this could lead to geopolitical tensions in the long term.

1.3.Resources and Infrastructure: Structural Limitations

Limited or lack of access to advanced technologies and necessary infrastructure in developing countries, such as reliable internet access and power supply, create barriers for businesses and individuals in the Global South to benefit from the economic innovations and opportunities of AI, and this digital divide may result in slower growth compared to their northern counterparts. As the developed countries lead in AI technology and infrastructure, the developing countries will heavily depend on foreign technologies, which may not be compatible with the resources and infrastructure available in the Global South. This could also mean that developing countries may become reliant on software, algorithms, and systems they do not control or fully understand. In other words, AI-driven economy systems that are designed by the Global North will claim less effective in the context of the Global South. This will consequently result in misaligned priorities, where the needs of developing nations are eclipsed by the profit-driven interests of AI providers from high-income economies.

1.4. Job Displacement in The Global South

Automation and labor substitution may affect lower-skilled jobs that are prevalent in the Global South, increasing unemployment and social instability. AI and robotics have the potential to disproportionately transform the industrial landscape of the globe. The implementation of these new technologies is particularly concerning for the Global South, where most economies rely heavily on lower-skilled jobs in sectors like manufacturing, agriculture, and services. As these sectors increasingly adopt automated solutions to optimize efficiency and reduce costs, workers in these low-wage positions may find themselves at risk of displacement.

The rapid pace of automation can outstrip the ability of local economies to retrain workers or create new job opportunities, resulting in heightened unemployment rates. This situation can exacerbate the existing socioeconomic inequalities between the Global North and its counterpart and fuel social disruption.

1.5. Re-Shoring

Another major challenge for low-income countries is the potential for the fourth industrial revolution to lead to a shift of manufacturing back to advanced economies. This could happen if low-cost labor is no longer a key factor for company competitiveness. Historically, developing strong manufacturing sectors based on cost advantages has helped countries build capital, transfer technology, and increase incomes. If this is no longer the case, many countries will need to reconsider their industrialization strategies. Understanding how developing economies can benefit from the fourth industrial revolution is crucial. There potential risk is that this revolution could create a winner-takes-all scenario, increasing social tensions and conflicts and leading to a more unstable world where social unrest, mass migration, and violent extremism aggravate.

2.THE MICROECONIMIC IMPACTS OF AI

2.1.Individual and Small Businesses

The integration of AI in global economy can have profound influences on the informal sector prevalent in the Global South. This sector can make up a substantial share of employment in developing countries. Some of these jobs, such as services platforms driven by AI, can further reinforce informality by facilitating gig work with few protections. Workers in the informal sector often lack access to social protections such as healthcare, unemployment benefits, or labor rights, and AI can aggravate such precarious work conditions in this sector since these workers are considered as independent contractors and not employees. Also, job displacement caused by automation can increase the number of individuals working in the informal sector. Low-skilled jobs can disappear, and therefore, displaced workers can resort to the informal economy to generate income, facing both dire work conditions and financial insecurities, leading to social instability in those regions.

In many Global South economies, small enterprises make a large part of the private sector, and the impact of AI on market competition and labor dynamics can pose a critical challenge. Limited or lack of access to technology can bring about decisive results in the Global South in which economic inequalities are already present. Furthermore, limited capital is another issue. As companies in the Global North have access to vast financial resources through venture capital and global financial markets, small businesses in the Global South struggle to secure funding. Large companies in developed countries scale quickly, invest in cutting-edge technology, and enter new markets aggressively. Increased competition from larger firms can cause small businesses to lose their customer base and fall further behind being unable to compete with larger corporations that have significant cost advantages, efficient production methods, product quality, and global reach.

2.2.Brain Drain: Physical and Virtual Migration

The dynamics of the fourth industrial revolution in the Global North creates a high demand for skilled professionals from one side. Impacted by job displacements, lack of adequate training, and slow economic growth induced by a rapidly growing economy in the Global North, skilled workers and professionals, such as machine learning engineers, data scientists, and AI researchers would seek better job opportunities in developed countries, lured by better work conditions, improved infrastructure, research facilities and opportunities, and financial rewards for career development. Also, remote work opportunities enhanced by AI can integrate skilled workers from the Global South without leaving their home countries. This winner-takes-all dynamic would further widen the gap between a developing Global South and the Global North since the outflow of intellectual capital might not necessarily take a physical form; it would rather be digital/virtual. Professionals would contribute to the development of economies and industries outside of their home countries. The value creation these professionals generate through research, innovation, and technical expertise would be largely captured by the Global North.

3. CHALLENGES AND OPPORTUNITIES OF ARTIFICIAL INTELLIGENCE

The United Nations 2030 Agenda for Sustainable Development has set seventeen Sustainable Development Goals (SDGs) targeting critical global challenges such as poverty, inequality, climate change, education, and health. The growing role of AI and ML in the global economy can either provide significant opportunities of cooperation or pose challenges that hinder the achievement of these goals by 2030. The agenda's four Ps: People, Planet, Prosperity, and Peace, aims to ensure economic welfare through good technology that is in harmony with nature. For example: AI and ML can help mitigate conflict and suggest solutions through advanced simulations used to improve partnership programs among the peoples of the world. Also, AI can also help democratize education and training sessions for aspiring students and professionals around the globe and create research facilities that address the local needs of developing countries. It can promote and boost inclusive economic growth by enhancing productivity, optimizing resource use, and creating new industries and job opportunities in areas like data science, machine learning, and AI-related services. In the primary and secondary sectors, it can increase efficiency through investing in re-skilling and up-skilling programs to ensure that workers displaced by AI technologies can transition to new roles. AI policies in world economics can be built and developed to ensure that the benefits of the fourth industrial revolution are equitably shared and that such leap does not exacerbate the existing inequalities. Bridging the gap between the Global North and the Global South in the context of AI-driven economic development requires a comprehensive strategy that fosters equitable access to technology, promotes innovation, and addresses systemic disparities. Some of the key points that can be taken into consideration include.

3.1.Access to Digital Infrastructure and Connectivity

Access to digital Infrastructure and cutting-edge technology can still pose a challenge in some regions of the Global South. limited or unreliable internet connectivity can hinder the adoption of AI-driven technologies in the world of economy. Governments, international organizations, and private sector agents should invest in expanding digital infrastructure in those regions.

Public-private partnerships can help facilitate and ensure access to the internet in order to offer remote work, e-learning, and participation opportunities in the global digital economy.

3.2. Innovative Local Plans

AI technologies can help The Global South create and develop local educational systems and AI research and innovation hubs that are focused on the local needs and challenges on those regions. These can foster the inclusion of AI and digital literacy, such as data science, coding, and machine learning, in national education curriculums, empower homegrown talent and promote local research and innovation. This can also be enriched through cross-border collaborations in education and knowledge sharing to equip students, trainees, and workers with the skills, competencies, and experiences needed to address the local issues and find innovative solutions accordingly.

3.3.Responsible Governance

International organizations and governments can collaborate to secure an ethical governance of AI in global economy to bridge the economic gap between the Global South and the Global North. A key strategy is the development of an international inclusive AI policy framework with regulations that are tailored to local contexts. These policies should have as basic tenets the promotion of transparency, fairness, and accountability. International cooperation for ethical AI development should also ensure that innovations are globally beneficial and equitable and should develop accountability mechanisms to monitor the impact of AI applications in both regions, which will promote fair distribution of AI benefits and pave the way for sustainable and inclusive economic growth globally.

4. CONCLUSION

The integration of AI-driven technologies in the global economy can generate promising opportunities and yet raise profound challenges. While AI has the potential to drive unprecedented productivity, innovation, and growth, it also risks exacerbating existing disparities, especially in regions lacking access to necessary infrastructure and technological expertise. This would yield dire economic, social, and political issues that could influence both regions directly or indirectly. The automation of certain jobs in some economy sectors, the risk of digital dependency, and the potential for economic marginalization in the Global South underscore the need for responsible governance led by governmental and non-govermnetal organizations should ensure equitable access to AI technologies through international cooperation. By fostering inclusive policies, democratizing education, investing in digital infrastructure, and supporting local innovation strategies relevant to the needs of the marginalized regions, the global community can work towards ensuring that AI-driven growth benefits both parts. The key to unlocking the potential of AI-driven technolgies in economy lies in balancing its transformative power with ethical governance, so that AI serves as a tool for sustainable development and global economic equity, rather than deepening divides.

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IDENTIFICATION OF KEY DETERMINANTS OF DEMAND FOR CULTURAL HERITAGE SITE USING SEM METHOD

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ABSTRACT

Cultural heritage sites are valuable resource for tourism industry development. Increased interest of tourists for those sites also presents a challenge for local authorities related to management of those sites and their adequate valuation. Different techniques were used lately for the purpose of heritage valuation and assessing demand function for those sites. This paper aims to identify, using previous research, key determinants of demand for cultural heritage site using example of Stari most (the Old Bridge) in Mostar, Bosnia and Herzegovina that has been a World heritage site since 2005. Following increased number of tourists, the need to set appropriate polices and measures as well as to recognize key factors driving tourist demand have increased. This study examined the most important economic and social factors that can contribute to the adequate strengthening of tourist demand and the attraction of tourists using Structural Equations Modeling (SEM) method and Travel Cost Method (TCM).

Keywords: *cultural heritage site, techniques of heritage valuation, tourist demand, SEM, TCM*

1. INTRODUCTION

Cultural heritage, according to UNESCO, includes "artefacts, monuments, a group of buildings and sites, museums that have a diversity of values including symbolic, artistic, aesthetic, ethnological or anthropological, scientific and social significance" (UNESCO, 2009). The application of economic techniques and models to value heritage sites can add to the understanding of the broader economic value of these assets to society according to Choi et. al (2010). The appropriate methods could assist local and state authorities to form better policies and secure adequate support for those sites. Market techniques of valuation according to Kaminski, McLoughlin and Sodagar (2007) do not reveal the full range of values produced by a heritage site. Those techniques are focused on assessing costs and benefits and direct and expenditure effects. On the other hand, non-market techniques try to capture the specific nature of heritage goods and those values and benefits that are not captured by traditional methods. There are two types of values associated with non-market techniques: use value and non-use value. Use value is the direct value for the consumer of heritage service as a private good (Merciu et.al. 2020). It may also be defined as the maximum willingness to pay to gain access to the site (Navrud, Ready 2002). Use value comes from the use of heritage site, for instance, visits to cultural heritage sites.

Non-use value is value for those who benefit from cultural heritage as a public good (Merciu et. al. 2020). It may take different forms such as an option value, existence value or bequest value (Iorgulescu et. al. 2011). The techniques of valuation of cultural heritage may use different approaches to measure use and non-use value through methods of revealed and stated preference. Revealed preference is based on actual purchasing decisions of individuals. It includes Travel Cost and Hedonic Pricing methods of valuation. Stated preference is based on possible reactions of consumers to changes in the market. It can measure non-use value through methods of Choice Modelling and Contingent Valuation

2. VALUATION OF CULTURAL HERITAGE THROUGH TRAVEL COST METHOD

One of the techniques of revealed preference is Travel Cost Method (TCM) that uses information on visitors' cost of travel to derive a demand curve. This method takes into consideration only the use value of a particular good. (Iorgulescu et. al. 2011). Travel Cost Method is about valuing cultural heritage in a way that the amount an individual pays for traveling to a particular site represents the value of goods and services provided at the site (Armbrecht 2014). The demand curve for TCM assumes that demand for a recreational destination, natural or cultural one, is inversely related to travel costs that a visitor is willing to pay (Merciu, Petrisor and Merciu, 2021). Besides costs of travel there are also other factors that might affect the number of visits to a site such as: trip costs to substitute sites, experience at the site, income and age of visitors, personal preference etc. and those should be included in the model (Yung, Yu and Chan 2013, Kaminski, McLoughlin and Sodagar 2007). According to Fonseca and Rebelo (2010) TCM is the most appropriate to use for valuing already existing places and to estimate demand in the absence of reference prices.

2.1. Travel Cost method and determinants of demand

TCM has been used in past decades mostly in environmental economics to assess the value of parks and other recreational areas. It was used less often in valuation of cultural heritage sites especially in Europe. One of the first studies that used TCM for valuation of heritage sites from Bedate, Herrero and Saz (2004) for Spain focused on calculating consumer surplus. The authors concluded that ranking of four sites they valued based on consumer surplus correlated with attractiveness of heritage sites (Kaminski, McLoughlin and Sodagar 2007). In past two decades there have been few studies that used TCM for valuation of cultural heritage sites and focused on identifying factors that affect the demand for a particular site. Studies by Fonseca and Rebelo (2010), Vicente and de Frutos (2011), Egbenta (2017), Torres-Ortega (2018), Merciu, Petrisor and Merciu (2021), examined the effects of d demand factors such as income, gender, age, nationality, level of education, satisfaction, motivations on visits of particular heritage sites.

Fonseca and Rebelo (2010) shown that variables of gender, educational level and travel cost were statistically significant in case of museum classified by UNESCO as World heritage site. The results indicate that travel cost affect negatively the number of visits. The number of visits tends to increase along with educational level and women tend to visit more. Vicente and de Frutos (2011) applied TCM for the case of exhibition in Spain and concluded that travel costs have significant negative effect on number of visits and that income has positive effect. Egbenta (2017) shown that travel costs were statistically significant with negative effect on number of visits for historic building in Nigeria. The results have indicated that value placed by visitors is higher than the price charged that can be a signal to institutions about price forming. Torres-Ortega et. al (2018) applied travel cost method for museum in Altamira, Spain. This study used two variations of TCM method: individual and zonal one. For individual TCM model travel costs were negatively related to number of visits and another important factor was age of the visitors meaning that the older the visitor the higher number of visits.

Zonal method, besides identifying negative effect of travel cost, identified significant positive influence of income of visitors on their number of visits. Merciu, Petrisor and Merciu (2021) used TCM for estimating the value of cultural heritage - historical center of Bucharest and concluded that tourists' motivation, the quality of recreational experience (specific features of historic sites and quality of infrastructure), desire to revisit historic site (total cost of travel) and income of visitors affect demand of tourists. These studies used different types of regression models to examine the impact and significance of various determinants of demand. All the studies identified travel cost as an important factor of demand with a negative effect on the number of visits. Other factors of demand were also addressed but definite conclusions about their importance and effects cannot be made due to the limited number of studies and difference in results of those studies. Despite being used less one of the main advantages of TCM is that it can be used for modelling consumer behavior and to identify factors that drive demand for a particular heritage site. As such Travel Cost Method can be of help to different levels of government in formulating adequate strategies and policies of using heritage sites as a tourism resource. That is why this concept was used to identify the key determinants of demand in case of the Old Bridge in Mostar, a World heritage site that has been experiencing a great increase in number of tourist visits in past few years.

3. METHODOLOGY

3.1. Case study

The Old Bridge was built in 1566 according to the project of Mimar Hajrudin. Over time, it became a symbol of Mostar, the main part of its historical landscape. Neidhart believes that the Old Bridge is the personification of Mostar, what Notre-Dame is to Paris or Hagia Sophia to Istanbul (Neidhart, Čelić 1953). During its many centuries of existence, it connected the banks of the Neretva but, unfortunately, it was demolished during the war on November 9, 1993. Thanks to the efforts of the Bosnian authorities, as well as the international community, the restoration of the Old Bridge was successfully completed in 2004. The Old Bridge area of the Old Town of Mostar was inscribed on the UNESCO World Heritage List in 2005 on the basis of cultural criterion with the following explanation: "With the "renaissance" of the Old Bridge and its surroundings, the symbolic power and meaning of the City of Mostar - as an exceptional and universal symbol of coexistence of communities from diverse cultural, ethnic and religious backgrounds - has been reinforced and strengthened, underlining the unlimited efforts of human solidarity for peace and powerful co-operation in the face of overwhelming catastrophes." (UNESCO 2005)

3.2. Data and Methods

For the purposes of collecting primary data, a survey questionnaire was designed based on relevant literature and analysed secondary sources. The survey was conducted in the territory of Bosnia and Herzegovina, the location of the city of Mostar - The Old Bridge. One group of questions related to socio-demographic characteristics of visitors. The next dimension were questions related to travel costs. The survey process included visitors from Bosnia and Herzegovina and other countries. Primary data were collected by direct survey of respondents in the period June 2023-July 2024. In order to assess the impact and analyse the relationship between the modelled variables, the application of specific statistical procedures is necessary. Modelling with structural equations enables the inclusion of all variants in one procedure, through one concept model including cause-and-effect relationships between a set of latent variables and also relationships between latent variables and associated manifest variables (indicators). Confirmatory Factor Analysis (CFA) was applied with a graphical presentation of all variables and corresponding relationships. Manifest variables are directly observed through answers to survey questions.

Latent variables were introduced as hypothetical constructs, and they cannot be measured directly, so conclusions are made based on manifest variables. In the paper, they are presented with several observed variables that represent indicators of formed latent constructs. The confirmatory factor analysis was the preparation of data for the application of the structural equation modelling (SEM) method. Structural equation modelling (SEM) examines relationships between indicators and latent variables, as well as structural models of relationships between latent variables. The measurement model is a part of the SEM model and refers to the relationships between manifest and latent variables, while the structural model shows all the dependence relationships exclusively between latent variables (Hair et al., 2010). By model estimation, relationship' empirical values were obtained between manifest variables and latent constructs as well as between the latent constructs themselves.

3.3. The model

Based on the conducted research, a model was created to assess the impact of socio-demographic characteristics of visitors, profile of visitors and direct costs to visits (number of visits). For the purpose of the analysis, a structural model was created taking into account the sequence of constructs and their relationships. After that, the reliability of the measuring instruments was tested by calculating Cronbach's alpha which is expressed as an average correlation between all manifest variables included in the measurement scale. The calculation of the Cronbach's alpha was repeated until the Cronbach's alpha was greater than 0.70 for each individual variable and construct. In this way, it was established that the following constructs and their associated manifest variables should remain in the analysis:

- Measuring instruments for Socio-demographic characteristics (SDC): Age, Sex, Level of Education (Ed)
- Measuring instruments for Profile (PROF): Montly income of all members of household (Mi), Motive for visit (Mv), Type of visitor (Tv)
- Measuring instruments for Direct costs (DC): Means of transportation used to arrive at destination (Mot), Travel cost from home to destination (e.g. fuel costs, tolls, airplain tickets, etc.) (Tc), The costs of stay at destination and visiting cultural heritage monuments (e.g. museum tickets, guides' fee, cost of accomodation or total amount of costs) (Sc)
- Measuring instruments for Visits: Time spent on visiting cultural heritage monuments at destination (Ts), Visit dynamics (Vd), Enjoyment of stay at destination (proportion of enjoyment visiting cultural heritage monuments compared to total enjoyment of stay at destination) (Es)

The final model contains 4 latent and 12 manifest variables, and it was specified based on the data of 198 visitors to the Old Bridge.

Figure following on the next page

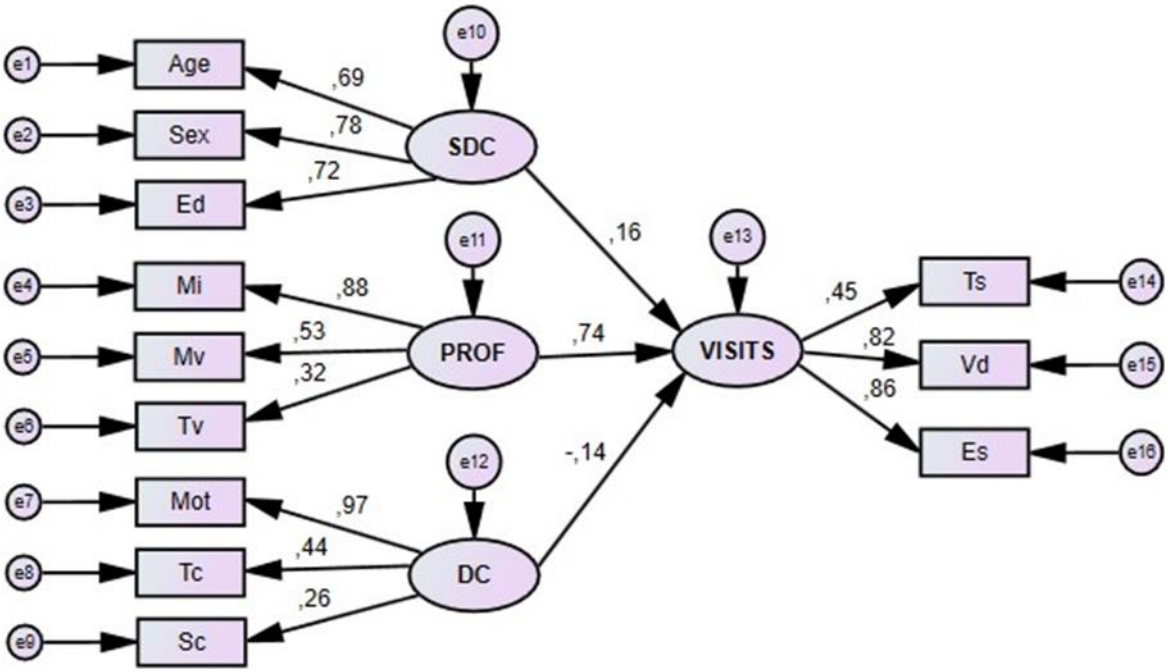

Figure 1 Specification of the final measurement and structural model

According to Hair et al. (2017), an assessment of the construct validity of the proposed model was performed, as well as an assessment of structural relationships. The empirical values of the association between manifest and latent variables (for the measurement model) and the empirical values of the association between the latent variables (for the structural model) were analyzed. Estimation of relationships was carried out on the basis of path coefficients and hypothesis testing that the path coefficients are significantly different from zero. A value of the path coefficient close to ±1 indicates a strong positive or negative relationship, so that a higher value of the path coefficient indicates a greater influence on the variable (endogenous) towards which the arrow is pointing.

4. RESULTS

The model confirmed that the three selected dimensions: Socio-demographic characteristics of visitors, Profile of visitors and Direct Costs are adequate for the determination of Number of visits to the Old Bridge. The estimated regression coefficients are statistically significantly different from zero. About 59% of the variation of the endogenous variable is explained by the variation of the exogenous variables Socio-demographic characteristics of visitors, Profile of visitors and Direct Costs. Namely, 49% of the total variability within the number of visits can be explained through the influence of the Profile of visitors. A statistically significant influence of variables Direct Costs and Socio-demographic characteristics of visitors were also established, with 7% and 3%, respectively.

The unstandardized and standardized coefficients values with associated standard errors and p-values are given in Tables 1 and 2.

			Estimate	S.E.	C.R.	P
VISITS	<---	DC	-,043	,028	-1,533	,025
VISITS	<---	SDC	,076	,035	2,169	,030
VISITS	<---	PROF	,251	,053	4,746	***
Age	<---	SDC	1,000			
Sex	<---	SDC	1,268	,165	7,705	***
Ed	<---	SDC	1,084	,141	7,706	***
Mi	<---	PROF	1,000			
Mv	<---	PROF	,686	,113	6,068	***
Tv	<---	PROF	,290	,074	3,948	***
Mot	<---	DC	1,000			
Tc	<---	DC	,390	,187	2,084	,037
Sc	<---	DC	,280	,148	1,894	,048
Ts	<---	VISITS	1,000			
Vd	<---	VISITS	3,178	,532	5,970	***
Es	<---	VISITS	2,890	,482	6,001	***

Table 1. - Regression Weights

			Estimate
VISITS	<---	DC	-,140
VISITS	<---	SDC	,162
VISITS	<---	PROF	,740
Age	<---	SDC	,691
Sex	<---	SDC	,778
Ed	<---	SDC	,720
Mi	<---	PROF	,875
Mv	<---	PROF	,531
Tv	<---	PROF	,321
Mot	<---	DC	,971
Tc	<---	DC	,435
Sc	<---	DC	,258
Ts	<---	VISITS	,446
Vd	<---	VISITS	,817
Es	<---	VISITS	,856

Table 2. - Standardized Regression Weights

According to the relative importance of the path coefficients, a conclusion can be drawn about the relationships between predictors and endogenous constructs, so that:

- Age, Sex and Level of Education statistically significantly affect the Socio-demographic characteristics of visitors;
- Monthly income of all household members, Motive of visit and Type of visitor contribute statistically significantly to the explanation of Profile of Visitors;

- Means of transport for arriving at the destination, Travel expenses from home to destination (e.g. fuel costs, tolls, plane tickets, etc.) and Costs of staying at the destination and visiting cultural heritage monuments (e.g. Museum tickets, guides fee, accomodation costs or total amount of costs) make a statistically significant contribution to Direct Costs.

The statistic of goodness-of-fit indicates a reasonable model (λ^2-Chi-square=269.948, df=61>1, CFI=0.959, TLI_{SB}=0.953, RMSEA=0.062, SRMR=0.051 and p-value: 0.000). The fitted model is overidentified because df=51[1]>1 (for that model λ^2=269.948). Because λ^2 test is the high sensitivity to the sample size, it is preferable to divide the value of λ^2 by the number of degrees of freedom, i.e. λ^2/df=269.948/61=4.4<5. Since the obtained value is below the recommended threshold of 5, it indicates an acceptable agreement and adequate representativeness of the model. And other coefficients (*Comparative fit index:* CFI=0.959≥0.95; *Tucker-Lewis index*: TLI_{SB}=0.953≥0.95; *Standardized Root Mean Square Residual*: SRMR=0.051 ≤0.08; *Root Mean Square Error of Approximation*: RMSEA=0.062≤0.07) indicate the adequate representativeness of the measurement model.

The results of the causality analysis point to the conclusion that the following hypothesis can be accepted:

Socio-demographic characteristics of visitors, Profile of visitors and Direct Costs affect Number of visitors to the Old Bridge.

Hypothesis	B	SE	p-value	Result
SDC→ Visits	.162	0.035	.030	accepted
DC →Visits	-.140	0.028	.025	accepted
PROF→ Visits	.740	0.053	.000	accepted

Table 3 Results of hypothesis testing

The analysis carried out and the collected data provided a framework for the quantification of Number of visits using the following regression equation so that

$$Visits = \beta_1 * SDC + \beta_2 * PROF - \beta_3 * DC$$
$$Visits = .162 * SDC + .740 * PROF - .140 * DC$$

, where β_i, for *i=1,2,3*, are called regression coefficient.

5. CONCLUSION

World heritage sites, as in this case, the Old Bridge in Mostar, are a valuable resource in tourism that can help growth and development of a city and region and contribute to employment. It is essential that the authorities formulate policies that would help in preservation and maintenance of the site but also efficiently use its potential from a tourism industry point of view. To do that it is necessary to identify specific types of tourists that want to visit the site and formulate policies to attract more of them.

[1] **Computation of degrees of freedom**

Number of distinct sample moments:	90
Number of distinct parameters to be estimated:	29
Degrees of freedom (90 - 29):	61

Using the concept of TCM on the example of the Old Bridge the key determinants of demand for the site were identified. The influence of the analyzed variables (Socio-demographic characteristics of visitors, Profile of visitors and Direct Costs) on the number of visits is statistically significant, which can be characterized as moderate in terms of the intensity of the influence. It was found that 59% of the total variability within the number of visits can be explained as a result of the influence of predecessor constructs as a synthetic action of their dimensions (three for each endogenous construct).

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INTERDEPENDENT PLANNING AND BUSINESS DECISION-MAKING PROCESSES: LESSONS LEARNED

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ABSTRACT

Business planning and the decision-making process are two interrelated activities that are crucial for the successful management of an organization. Their interdependence stems from the need to coordinate different business elements in order to achieve strategic goals. Business planning involves defining goals, strategies, and tactical plans that guide the organization toward desired outcomes. In this process, management analyzes internal and external factors, assesses resources and identifies opportunities and threats. On the other hand, the decision-making process refers to the choice among alternatives identified during business planning. Quality planning provides a solid basis for making informed decisions. Detailed plans allow managers to understand the context and implications of their decisions and to choose the most appropriate actions. Without a clear plan, decisions can be disorganized, reactive and risky. decisions made during planning often require adjustments to plans. The iterative feedback loop between planning and decision-making ensures the organization's flexibility and adaptability in a dynamic business environment. Decision making may reveal gaps or opportunities that were not foreseen in the initial plans. This knowledge can lead to the revision and improvement of plans, which continuously improves the efficiency of operations. With the aim of defining the interdependence of business planning and the decision-making process, this research was conducted on a deliberate sample in order to determine the necessity of planning in the successful management of an organization.

Keywords: *business planning, the process of making business decisions, market dynamism, quality of the business process.*

1. INTRODUCTION

Planning is defined as one of the fundamental functions of management, that is, the first function which also starts the entire process of management and further development of any process. Planning is very necessary not only in the business world but also in everyday situations. As far as business planning is concerned, it defines a vision of a certain future state of a particular company in order to achieve future goals more easily. In general, it is necessary for companies to plan their mission and vision in order to make further business processes as easy and coordinated as possible. It is therefore very important that certain companies plan the tasks that the employees will perform. When planning is conducted, it is necessary to consider the limitation of resources and in this way to carefully plan their use. There are certainly numerous uncertain situations. unpredictable problems and risks arise. and planning itself tries to overcome such levels of difficulty. In order for a certain company to be able to suppress the resulting problems in a proper way, it is necessary to consider the stage the company is currently in and what the company's future goals are.

These facts are the starting point for further planning and the use of adequate managerial tools in everyday business planning and business decision-making accordingly. Given the level of uncertainty and possible risks. planning is carried out in order to reduce such situations and thereby enable more adequate business decision-making. Proper planning also requires reliable business leadership in order to achieve the most successful business results within business processes.

2. THE INTERDEPENDENCE OF PLANNING AND BUSINESS DECISION - MAKING FUNCTION

Planning is an activity that includes decisions related to goals, resources, behaviour, and results. Planning can be defined as the process of determining the way in which the organization tries to get where it wants, with previously defined goals (Certo and Trevis Certo, 2008, 134). Planning is the process of defining what a certain organization tries to achieve with previously defined and set goals and how it tries to achieve it with strategies and plans (Bahtijarević-Šiber et al., 2008, 139). As one of the functions of management, planning is connected with all other managerial functions, and mostly with the control function. Planning, together with control, is considered the "Siamese twin" of management, and any control without an adequately implemented plan is harmless (Bahtijarević Šiber et al., 75). Organizational skills and adequate use of planning functions are fundamental aspects of successful business. The ability of managers to effectively plan and manage business processes directly affects the company's ability to deal with unpredictable circumstances and risky situations. The previous business processes unequivocally show that without adequate managerial skills, there are no business results of high-quality. Benn et al. (2014) believe that integrated sustainability activities have a key role, including minimizing pollution, efficient use of resources, improving their relationship with stakeholders and ensuring economic progress (Benn et al., 2014). In the literature, corporate culture is an important attribute to improve the performance of the business process, and thus business results (Jabbour and de Sousa Jabbour, 2016). Corporate culture can have a negative as well as a positive impact on the success of a company. For example, Lozano (2013) found that corporate culture inhibits the implementation of a company's change process, while sustainability requires fostering innovation and cultural change within the company.

3. RESULTS AND DISCUSSION

Knowledge of the business process. business process planning has a positive effect on business decision-making, financial literacy that reduces risks when making business decisions, better financial, and management planning, but also, awareness of the advantages of managing business processes from planning to the end of the business process within the organization. Therefore, the hypotheses in this paper are:

Hypothesis H1:
Business process planning is positively correlated with business decision-making.

Hypothesis H2:
Uncertain and risky business is the result of poorly used planning functions.

In this research, the pattern is intentional, which means that the managers of small and medium-sized enterprises of the Republic of Croatia (SMEs) were selected as respondents.

Purposive sampling allowed the authors of the paper to focus on a specific group relevant to the research objectives, which ensured that the collected data were as relevant and useful as possible for analysis. Namely, in 2023, 395 managers of small and medium enterprises of the Republic of Croatia participated in the research, after a pilot study was conducted on 109 respondents. Out of the total number of respondents, 15.94% are women. The size structure of the selected companies shows that 65% of the surveyed managers are medium-sized, while the other 35% are classified as small business managers. Regarding the legal form, the observed trading companies are organized as limited liability companies. 61% of them. The other 39% are simple limited liability companies. The largest number of companies from the sample operates in the processing industry, 27%, followed by wholesale and retail trade with a share of 19%, and communal services with 11%. The smallest share refers to mining, only 2%, then comes banking. insurance and business consulting with a share of 4.62%, and information-telecommunications and telecommunications with 5.38%. Considering the previously described characteristics of the companies from the sample, it can be concluded that the selected sample is representative and the obtained results can be declared as reliable, and the derived conclusions are considered valid. In order to check the reliability of the measuring instrument. In this case, a questionnaire was conducted, and the Cronbach Alpha coefficient was used. Cronbach's Alpha is a statistical indicator of the reliability of the internal consistency of a set of questions or items in a survey questionnaire. It is used to assess the degree of coherence between different items measuring the same concept or dimension. This is especially important in research and surveys where you want to know how reliably your instruments measure a certain construct.

Table 1. - Cronbach Alpha coefficient for H1 and H2

Reliability Statistics		
Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
0.946	0.945	16

In the analysis of H1 and H2, it is 0.946 based on the tested 16 particles. This value is extremely high and suggests that the items in the questionnaire correlate with each other and are consistent in measuring the construct under study. This means that the items that make up the questionnaire are uniformly directed towards the same concept and that the results of the survey will be reliable for the assessment of that construct. A descriptive statistical analysis was also carried out through the research. Table 2 shows the indicators that were investigated to prove different claims. Respondents could choose answers to the questions in the table using a Likert scale, where grade 1 represented the lowest possible grade, and grade 5 the highest possible grade.

Table 2.1 - Descriptive statistics' results

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
I make business decisions with a pre-defined mission and vision.	395	1	5	4.68	.667
I make decisions based on careful analysis rather than relying on instinct.	395	1	5	4.25	.810
If I do not apply planning functions, I encounter risky situations.	395	1	5	3.97	.814
If I do not apply planning functions, I am faced with a more difficult reflection.	395	1	5	3.89	.879
If I do not apply planning functions, I encounter difficulties in making business decisions.	395	1	5	3.93	.872
If I do not apply planning functions, I encounter ineffective business results.	395	1	5	3.78	.879
Planning is a fundamental function of management and contributes to easier business decision-making.	395	1	5	4.81	.618
Valid N (listwise)	395				

The results shown in Table 2 bring the results of descriptive statistics and explain the choice of research particles. Hypothesis H1 suggests a positive relationship between business process planning and the quality of business decision-making. In other words, when business processes are well planned, making business decisions becomes more efficient and of better quality. Planning business processes includes defining goals, resource planning, deadlines, and identification of potential obstacles and solutions. Through this systematic approach, managers and decision makers have a clearer insight into the operational aspects of the business, which enables them to provide information and reflection in connection with making business decisions. For example. good planning helps to identify opportunities for growth or identify risks that may affect the business, which directly affects the quality and precision of the decisions that are made. Respondents answered the questions with a minimum score of 1 and a maximum score of 5, and the results of the descriptive statistics are as follows:

- "I make business decisions with a pre-defined mission and vision" (M=4.68; SD=.667);
- "I decide based on careful analysis more than relying on instinct" (M=4.25; SD=.810);
- "If I do not use planning functions, I encounter risky situations" (M=3.97; SD=81=3.89);
- "If I do not use planning functions, I encounter more difficult thinking" (M=3.89; SD=.879);
- "If I do not use planning functions, I encounter difficulties in making business decisions" (M=3.93; SD=.872).

When it comes to hypothesis H2, the conclusion is made that it is important to direct the planning function properly and when the planning functions are not used adequately or are used in a bad way, the business becomes uncertain and risky. Uncertainty and risk in business can

manifest through unpredictable financial results, unstable operational processes, and difficulties in reacting to changes in the market.

Planning functions, such as strategic planning, budgeting. forecasting and risk analysis play a key role in business stabilization. If these functions are neglected or carried out superficially, the company may find itself in situations where decisions are made based on insufficient information or wrong assumptions, which increases the risk of failure? For example, without adequate planning. a company may overestimate its capabilities or underestimate market challenges, leading to problems such as loss of market share, financial difficulties or operational collapse; "If I do not use planning functions. I encounter ineffective business results" (M=3.78; SD=.879). "Planning is a fundamental function of management and contributes to easier business decision-making" (M=4.81; SD=.618). In order to prove the association between the variables, the Pearson correlation coefficient was used. An analysis was made for each of the set hypotheses. The results of hypothesis 1 testing are presented in Table 3, and a detailed analysis related to H1 is presented in the further continuation of the paper.

Table 2. - Pearson's coefficient correlation results for H1

Descriptive Statistics			
	Mean	Std. Deviation	N
I make business decisions with a pre-defined mission and vision.	4.68	.667	395
I make decisions based on careful analysis rather than relying on instinct.	4.25	.810	395
I anticipate possible problems and create their solutions.	4.45	.715	395
If I do not plan adequately, I make business decisions hastily and thoughtlessly.	4.06	.955	395
I fully understand how the business processes in my department work.	4.56	.812	395
By planning and controlling finances, I avoid possible inconveniences for the organization.	4.56	.789	395
I am constantly developing my own knowledge and skills.	4.58	.699	395
Planning is a fundamental function of management and contributes to easier business decision-making.	4.81	.618	395
The motivation of each individual is necessary for team development.	4.82	.544	395

The variable "I make business decisions with a pre-defined mission and vision." has a strong positive correlation with the variables "I decide based on careful analysis more than relying on instinct" (r = 0.653) and "I foresee possible problems and create their solutions" (r = 0.296). This means that there is a statistically significant relationship between making business decisions with a predefined mission and vision and the ability to carefully analyze and anticipate problems. Also, it is important to note that all correlations between these variables have statistically significant values (p-values less than 0.05), which indicates that the correlations are statistically significant. These results suggest to us that participants who often make business decisions with a predefined mission and vision also often report that they make decisions based on careful analysis and tend to anticipate problems and create solutions. The above indicates that these traits are related and that people who have a more pronounced mission and vision are also more inclined to think and plan before making decisions.

Based on Pearson correlations, it can be concluded that there is a statistically significant connection between making business decisions with a predefined mission and vision and the ability to carefully analyze and predict problems. This can be useful in a business context as it suggests that managers who have a clearly defined mission and vision often make better informed decisions based on analysis.

Table 4. -3 Pearson's coefficient correlation results for H2

Descriptive Statistics			
	Mean	Std. Deviation	N
Organizational skills help to deal with unpredictable circumstances and risky situations.	4.44	.602	395
Previous business processes have proven to me that without adequate managerial skills, there are no high-quality business results.	4.27	.704	395
If I do not apply planning functions, I encounter risky situations	4.97	.714	395
If I do not apply planning functions, I encounter unpredictable situations.	4.92	.787	395
If I do not apply planning functions, I am faced with a more difficult reflection.	4.89	.779	395
If I do not apply planning functions, I encounter difficulties in making business decisions.	4.93	.672	395
If I do not apply planning functions, I encounter ineffective business results.	4.78	.679	395

This analysis, presented using descriptive statistics, can test hypothesis H2 and precisely measure the effect of using planning functions on risk, uncertainty and difficulties in making business decisions. These variables enable in-depth analysis and a better understanding of how planning affects business, and how crucial organizational knowledge is in planning. Based on the results of descriptive statistics, it can be concluded that planning is extremely important in the process of making business decisions:

- "Organizational skills help to suppress unpredictable circumstances and risky situations" (M=4.44; SD=.602);
- "The previous business processes proved to me that without adequate managerial skills, there are no high-quality business results" (M=4.27; SD=.704);
- "If I do not use planning functions, I encounter risky situations" (M=4.97; SD=.714);
- "If I do not use planning functions, I encounter unpredictable situations" (M=4.92; SD=.787);
- "If I do not use planning functions, I encounter unpredictable situations" (M=4.92; SD=.787);
- "If I do not use planning functions, I encounter more difficult thinking" (M=4.89; SD=.779);
- "If I do not use planning functions, I encounter difficulties in making business decisions" (M=4.93; SD=.672);
- "If I do not use planning functions, I encounter ineffective business results" (M=4.78; SD=.679).

In a dynamic business environment, organizational skills play a key role in combating unpredictable circumstances and risky situations. Previous experiences and business processes clearly show that without adequate managerial skills, there are no quality business results. This essay explores how the use of planning functions can significantly reduce business risks, uncertainties, difficulties in decision-making, and improve overall business efficiency.

Hypothesis H1: **Business process planning is in positive correlation with business decision-making.**				
Control variables	Efficiency of business process planning	Quality of business decisions	Accuracy of planning	Speed of decision-making
Auxiliary control variables	EBPP Aspect of business process planning	QBD Potential effect of business decisions of high quality	APF Potential effect of precision-based decisions	SDM Potential effect of rapidly made decisions
Regression Statistics				
Multiple R	0,0648	0,0910	0,2559	0,0740
R Square	0,0042	0,0083	0,0655	0,0055
Standard Error	0,3880	1,0046	1,4510	0,6753
Observations	148	148	148	148
ANOVA				
F	0,6163	1,2194	10,234	0,8018
Significance F	**0,4337**	**0,2713**	**0,0017**	**0,3720**
Standard Error	0,1086	0,2818	0,4071	0,1894
Accepted hypothesis			✓	
Hypothesis H2: **Uncertain and risky business operation is a result of poorly used planning functions.**				
Control variables	Use of planning function	Uncertainty of business operations	Business risk	Quality of business Decision
Auxiliary control variables	UPF	BU	BR	QBD
Regression Statistics				
Multiple R	0,0749	0,0105	0,1647	0,0077
R Square	0,0056	0,0001	0,0271	0,0000
Standard Error	0,3877	1,0087	1,4805	0,6771
Observations	148	148	148	148
ANOVA				
F	0,8237	0,0160	4,0688	0,0086
Significance F	**0,3656**	**0,8996**	**0,0455**	**0,9264**
Standard Error	0,0957	0,2490	0,3655	0,1671
Accepted hypothesis			✓	

Table 5. - Testing Hypotheses H1 and H2

In order to test the hypothesis that business process planning is positively correlated with business decision-making, it is necessary to define and measure the appropriate variables:

(i) efficiency of business process planning - the efficiency index is calculated on the basis of several factors such as clarity of goals, detail of plans, engagement of teams in planning and regularity of revision of plans;

(ii) the quality of business decisions – the quality of decisions is evaluated through a retrospective analysis of decisions made, their impact on business performance, return on investments and achievement of goals;
(iii) accuracy of forecasts - quantified by comparing predicted and actual results (financial, operational, market;
(iv) speed of making business decisions - time from the moment of recognition of the need to the moment of making the decision. Hypothesis H1 predicts a positive correlation between EBPP (Business Process Planning Efficiency) and QBD (Quality of Business Decisions), as well as between EBPP (Efficiency of Business Process Planning) and APF (Speed of Decision Making). Also, the hypothesis predicts a positive correlation between APF (Precision of Forecasts) and QBD (Quality of Business Decisions), as well as between APF (Forecast Accuracy) and SDM (Decision-Making Speed) By introducing planning forecast precision as a control variable, an analysis of the relationship between the efficiency of business process planning and the quality of business decisions is ensured which is unbiased and reflects the real impact, neutralizing any potential effect of forecast precision.

4. CONCLUSION

Planning, as a fundamental function of management, is very necessary in the implementation of business decision-making. It includes an analysis of the entire business environment, predicting possible problems and creating solutions, selection and finally choosing a business decision. In order for a certain decision to be as appropriate as possible for the company, it is necessary to consider and plan each step. Planning and decision-making are mutually dependent concepts and greatly affect the efficiency of the company. The conducted research established that planning plays a very important role in the process of making business decisions. Managers plan goals to a great extent, according to the vision and mission of the company to which they are guided in the future of business. In this way, they strive to achieve the established goals. Managers try to use managerial skills as much as possible, especially planning skills, communications, leadership, and organization. It was established that planning as a function of management is necessary. If not planned. unpredictable and risky situations arise that are difficult to suppress in a shorter period of time. In order that such situations would not be repeated often, managers believe that every employee is obliged to adopt as many managerial skills as possible. Such action will contribute to the improvement of the company's operations, but also, to achieve one's own success and development, in business, as well as on a personal level.

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KNOWLEDGE MANAGEMENT IN LIFELONG LEARNING ORGANISATIONS: A CASE STUDY OF A LEARNING ORGANISATION

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ABSTRACT

In today's dynamic society, the educational system encounters new demands and challenges stemming from advancements in technology, globalization, and changes in the working environment. Additionally, there is a pressing need for the continuous improvement of teaching methods within educational institutions. To adapt to these modern challenges and foster innovation in the educational process, the concept of lifelong learning is increasingly aligned with the principles of learning organizations and knowledge management. The purpose of this paper is to provide insights into the characteristics of learning organizations, the most common of which include systemic thinking, personal development, mental models, building a shared vision, and team learning, all aimed at achieving a competitive advantage. The case study method will serve as the primary research tool for this paper. Following the theoretical framework, the empirical part of the research will involve interviewing the director of the observed educational institution, People's Open University Novak, and surveying its employees. This approach aims to determine the development and progress of the concept of a learning organization, which is built on the foundations of lifelong education, and to explore how these two concepts are closely related to the process of knowledge management. The interview will utilize the Dimensions of the Learning Organization Questionnaire (DLOQ). Continuous learning within the organization fosters innovation, as employees contribute new knowledge and ideas. Furthermore, lifelong learning ensures that employees possess up-to-date skills necessary for maintaining competitiveness in the market. Knowledge management, which involves learning, collecting, sharing, and analyzing employee knowledge, can significantly impact the organization.

Keywords: *lifelong learning, learning organisations, tacit knowledge.*

1. INTRODUCTION

Learning and knowledge management organizations play a crucial role in ensuring the continued progress and success of educational institutions. Rather than being viewed as static entities that merely transmit knowledge, educational institutions are increasingly perceived as dynamic environments that continuously adapt and evolve through the learning process. The knowledge created through continuous learning becomes a key driver for successful business operations and adaptation in the educational market. In contemporary educational policies, lifelong education, or lifelong learning, is a key concept for addressing the rapidly growing need for new knowledge, abilities, and skills (Rogić, 2017). Lifelong learning within organizations that promote learning and manage knowledge is becoming an important factor in modern education.

There is no formal, universally accepted definition or conceptualization of lifelong education (O´Shea, 2003), given the broad context of its application and study. "Lifelong learning is defined as all learning activities undertaken throughout life, with the aim of improving knowledge, skills, and competences from a personal, civic, social, and/or employment perspective" (Agency for Vocational Education and Adult Education, 2023). It encompasses learning at all stages of life (from early youth to old age) and in all forms (formal, non-formal, and informal), whereby learning is understood as a continuous process in which an individual's achievements and motivation at any given time are influenced by the knowledge, habits, and learning experiences acquired at a younger age" (Agency for Vocational Education and Adult Education, 2023). Learning is not limited to formal education at specific life stages but is a continuous process that occurs throughout life. In a rapidly changing world, the acquisition of new knowledge, competences, and skills becomes essential for both professional and personal advancement. The concept of lifelong learning encourages individuals to adapt to environmental changes, proactively engage in learning, explore new subjects, and enhance existing skills. This concept is highly significant for all organizations today, including adult education institutions, which, since their establishment, have applied the principles of lifelong learning to both their students and employees. In this paper, the concept of a learning organization will be thoroughly analyzed through a qualitative review of relevant literature. Following the qualitative literature review, a case study of People's Open University Novak will be presented to determine whether the institution adheres to the principles of a learning organization. This paper is structured as follows: after the introductory considerations, the focus shifts to the analysis of the fundamental concepts of the learning organization. The third chapter presents an empirical research analysis based on a case study of the selected educational institution, People`s Open University Novak. The fourth chapter concludes by summarizing the analysis of the entire research.

2. THE LEARNING ORGANISATION – BASIC CONCEPTS

The concept of a learning organization began to develop in the early 1950s, but it has only come into the professional public's focus in the last 15 years. Active learning was integrated into the organizational concept in the 1980s, with many authors significantly contributing to clarifying the term and concept of a learning organization. However, most authors consider Senge's contributions to be the greatest (Banjević, 2020). According to Senge (2009), a learning organization is one that constantly adapts to changes in its environment. These environmental changes are characterized by trends such as rapid technological development, growing business globalization (and the resulting competitive pressure), increasing economic, social, and political inequality (and tension) between developed and underdeveloped countries, and the destruction of the natural environment (Galić, 2010). A learning organization is also referred to as a "learning organization," and Pedler et al. (1998) mention the term "learning company," which they consider less mechanical and more focused on any group of people within the company working together with others in the process of seeking and exploring ways for optimal work and coexistence. According to their view, a learning company is an organization that facilitates and promotes learning for all its members and continuously transforms itself, consciously changing its structure and content. This leads to the fundamental characteristics of a learning organization: the desire and ability for continuous learning, improvement, and the creation, acquisition, and sharing of knowledge. Furthermore, a learning organization is characterized by individual, group, and organizational learning, with the learning process starting from the individual level and forming the foundation for establishing a learning organization (Banjević, 2020).

Although Senge (2009) emphasizes systems thinking, which stresses the importance of viewing the organization as a whole where actions are interconnected, "the discipline of systems thinking is connected to other disciplines, especially mental models, shared vision, and team learning" (Rupčić, 2007). According to Rupčić (2007), systems thinking is necessary to translate a common vision into coordinated actions involving all individuals and teams. Through personal mastery, individuals continuously learn and develop skills to encourage independent improvement and contribute to collective excellence. Rupčić (2007) describes this as creating a developmental path that leads to a level of excellence through lifelong learning. Learning does not only pertain to areas related to the process of value creation but also includes the strengthening of interpersonal competences, awareness, emotional maturity, and the understanding of the ethical and moral dimensions of organizational life. "Mental models are deeply ingrained assumptions, generalizations, or even images about how the world works that influence how we perceive the world and act. They limit people to familiar ways of thinking and acting. Often, mental models influence individuals' behavior without them even being aware of it" (Senge, 2009). Shared vision, according to Senge (2009), answers the question, "What would we like to create?" Just as personal visions are images or ideas that people hold in their minds and hearts, shared visions are images that people throughout the organization possess. They create a sense of community that permeates the organization and aligns various activities. A shared vision results from the partial visions of individuals and teams (Rupčić, 2007).

2.1. Differences between a traditional educational institution and a learning organisation

By analyzing the disciplines of a learning organization, the following conclusion can be reached: "The basic difference between learning organizations and traditional organizations is the mastery of the so-called basic disciplines or key technologies" (Galić, 2010). A comparison between a learning organization and a traditional organization shows that a learning organization views environmental changes as opportunities for improvement and is proactive in comprehensively implementing them, whereas a traditional organization perceives these changes as threats and reacts to them belatedly. A learning organization learns in various ways, such as from its own failures, the experiences of other organizations, experimentation, and risk-taking. In contrast, traditional organizations tend to conceal failures, highlight successes, and avoid risks due to the potential for mistakes. "However, for a traditional organization to evolve into a learning organization, it is necessary to fulfill several fundamental tasks and provide basic elements, the most important of which are: personal development, mental models, the creation of a common vision, team learning, and systems thinking" (Galić, 2010). Some authors, such as Rowden (2001), state that learning organizations share the following common characteristics: they use learning to achieve goals, connect individual results with organizational outcomes, support discussions by creating a safe environment where individuals can openly take risks, and continuously interact with their environment. Berce (2008) asserts that the learning organization, its behavior, and its culture are linked to the organization's development direction and the development of its human resources, with a tendency toward continuous growth and the expansion of collective knowledge and skills to achieve desired outcomes. Specific to learning organizations is the valuation of new, expansive, growth-oriented thinking, greater creative freedom for individuals, and encouragement for individuals to recognize opportunities and face challenges. Empirical research has also demonstrated the positive influence of knowledge management in certain public institutions (Berce, 2008).

An organization that learns and creates knowledge must also manage that knowledge through various strategies. In such an organization, the role of a manager extends beyond merely leading; it includes motivating and assisting employees with their work and facilitating joint decision-making.

"Effective knowledge management requires a combination of people and technology. While humans are needed to understand, synthesize, and interpret various types of unstructured knowledge, computers and communication systems enable its collection, transfer, and distribution. Computer and network systems facilitate the simple and quick exchange of knowledge regardless of distance" (Đula, 2010). Knowledge transformed into value is called intellectual capital, which is measurable. According to Stewart et al. (2021), intellectual capital represents something intangible that nonetheless provides a competitive advantage and creates value in the market. Today, the number of assets a company possesses is less important than the ability of its employees to create value.

2.1. Knowledge management

Knowledge as a resource and knowledge management are treated as both inputs and outputs of learning. In learning processes, individuals seek data, information, and other forms of knowledge, which come from two primary sources: tacit and explicit knowledge. Tacit knowledge is rooted in the mental models of individuals, who initiate the construction of these models through interpretation and intuition. Knowledge exchanges within groups refine these mental models through a process of integration, resulting in a shared mental model. Although the degree to which these models are shared is difficult to measure, a certain level of commonality can nonetheless be anticipated. Therefore, knowledge can be perceived as an input at both the individual and group levels, while the output is shared knowledge. This input-output model can extend from the group to the organizational level, considering group dynamics, mental models, and organizational structures. Knowledge cannot be entirely controlled and is often derived from processes. Given that a high level of organizational knowledge and business culture is tacit, it is challenging to codify and detect. In companies where knowledge is crucial, knowledge is created and developed by employees and can be difficult to transfer due to its tacit nature. Nevertheless, the codification of knowledge aids in sharing tacit knowledge, and an organization's learning culture is a critical factor in effective knowledge management (Schmitz, 2014). Learning organizations play a key role in gathering tacit knowledge and making it accessible. Historically, the interaction perspective on organizational learning developed first. This perspective, based on the works of Argyris and Schön (1978) and organizational inquiry, posits that organizational members reflect on their work through interaction. This has contributed to the development of various learning models where organizational members are encouraged to continually ask questions about the organization (Hoe, 2007).

3. CASE STUDY OF A LEARNING ORGANISATION: PEOPLE`S OPEN UNIVERSITY NOVAK

The case study method in this paper served as the primary research tool. Following the theoretical part of the research, an interview was conducted with the director of the observed educational institution, People's Open University Novak, based on the Dimensions of the Learning Organization Questionnaire (DLOQ) recommended by Marsick and Watkins (1990). The DLOQ is the most well-known tool for measuring learning organizations. It is composed of four parts that include personal, team, organizational, and global questions, covering the entire scope of the organization being measured. The DLOQ was used as a measuring instrument in this paper due to the established consistencies between the measurement scales and questions, and it was adapted for the purposes of this research. Instead of distributing the questionnaire to the directors of educational institutions in Međimurje County, the questions from the DLOQ were adapted to conduct a structured interview for analysis within the framework of a case study. The structured interview was employed as the measuring instrument during the interview with the director of the selected lifelong education institution.

The questions from the structured interview, attached to this paper, were derived from the DLOQ as per Ivančan (2019). The interviewed director was required to select the degree of intensity of agreement with each statement, with intensities ranging from 1 (NEVER) to 7 (ALWAYS). In addition to the interview with the director of People's Open University Novak, part of this research includes a questionnaire addressed to ten employees of the university. This questionnaire aimed to gather responses related to the concept of a learning organization and the concept of lifelong learning.

3.1. Basic data on People's Open University Novak

The People's Open University Novak Mala Subotica is a public institution dedicated to permanent education, culture, and information. It performs its activities as a public service in accordance with the Decision on the Establishment of the University dated May 29, 2001, and the Decision of the Ministry of Education and Sports on the assessment of the conformity of that decision with the Law on Institutions (Public Open University Novak, 2023). The headquarters is located in Mala Subotica, with branches in Čakovec and Prelog. The People's Open University Novak implements adult education programs, including secondary vocational education, retraining, training, and professional development. These programs cover various educational sectors, including Transport and Logistics, Mechanical Engineering, Shipbuilding and Metallurgy, Agriculture, Nutrition and Veterinary Medicine, Construction and Geodesy, and Personal Protection Services and Other Services. All sixty-nine programs have been verified by the relevant ministries. Since 2016, the POU Novak Driving School has operated as part of the educational institution, offering training programs for candidates for A1, A2, A, B, C, and CE category drivers. The University currently employs ten full-time staff and twenty external associates, classifying it as a micro entity within the small economy sector (Official Gazette,130/23). The ten full-time employees are assigned to managerial positions, financial-accounting and administrative-technical tasks, client services, and teaching roles within the adult education programs. The institution's annual plan and work program outline tasks, activities, locations, schedules, methods, and task executors. It includes a list of planned tasks and activities, information on the organization of work, and the work plan of the andragogic leader. Adult education at the Novak Public Open University is delivered through various methods: regular, consultative-instructive, correspondence-consultative, or multimedia teaching. The predominant form is correspondence-consultative, which entails a schedule comprising 50 percent of the hours compared to regular classes. Due to the significantly reduced number of classroom hours, participants are provided with didactic materials (textbooks) for self-study in individual subjects by the University, along with organized group and individual consultations.

3.2. Research results based on the interview

The results of the employee structure based on seniority reveal that the highest percentage of employees (30%) have a seniority of up to five years. This indicates that the institution employs young, trained interns who, through the internship program with mentorship, learn how to thrive in a learning organization. Two employees have been with the institution for 6 to 10 years (20%), one employee has served for 11 to 20 years (10%), and four employees have over 21 years of experience, facilitating the exchange of knowledge and skills with the younger generation of employees. Of the total workforce, six employees are in roles directly involved in executing the educational process, which accounts for 60%. These roles, alongside external collaborators, cover the execution of educational programs as detailed in Table 2. The remaining 40% of the staff hold higher and lower-level managerial positions, including managers and directors.

In terms of general characteristics, the institution operates within the local area, across the Republic of Croatia, and in the international arena. Due to workforce fluctuations, there is an increasing demand for education, necessitating adaptations within the learning institution. The next set of questions required the principal interviewed to indicate the extent of their agreement with specific statements on a Likert-type scale from 1 (disagree) to 7 (strongly agree). The first nine questions pertained to the continuous management of changes within the organization, while subsequent questions addressed the disciplines of a learning organization, including personal development of employees, recognition of mental models, team learning, shared vision, and systems thinking. A total of 23 questions were posed (Ivančan, 2019). Table 1 provides an analysis of the average responses to the questions by group.

LEARNING ORGANISATION SPHERES	**AVERAGE SCORE – LIKERT BASED**
Changes	6.33
Personal development	6.50
Recognition of mental models	6
Shared vision	5.66
Team learning	7
Systematic thinking	7

Table 1. Average Level of Agreement by Question Group (Source: authors)

The obtained results indicate that the educational institution places significant emphasis on team learning and systematic thinking, which foster cooperation and dialogue within teams to collaboratively create new knowledge and promote creativity in solving complex problems. Systematic thinking highlights the importance of viewing the organization as a complex system where activities are interconnected. However, the disciplines related to personal development and the recognition of mental models are slightly less emphasized, suggesting an opportunity for enhancing the motivation behind the continuous process of individual learning and the development of knowledge and skills. This focus is crucial for encouraging personal intellectual growth, which can lead the institution to a competitive advantage. The discipline of recognizing mental models underscores the importance of understanding the surrounding factors in an organization that is subject to continuous change. The dimension least represented is the shared vision, where employees should be encouraged to transform their personal visions into common visions for the entire organization, fostering a sense of community. Through the analysis of the case study and the results of the interview with the director of the educational institution, it can be concluded that the People's Open University Novak actively implements the disciplines of a learning organization and engages in effective knowledge sharing and management.

3.3. Research results based on the survey

The results of the survey conducted with the employees of the Novak Open University are presented through descriptive analysis. The survey included open-ended questions to gain insight into employees' understanding of the concepts related to a learning organization and to assess their tacit knowledge. A total of ten employees from various departments participated in the survey. The survey was distributed in written form, and the responses were collected during April 2024, after which the analysis of the answers commenced.

Most employees reported being familiar with and actively involved in the institution's operations. However, it is important to note that, in accordance with the Law on Institutions (Official Gazette, 1993-2022), the Administrative Council of the Open University Novak is responsible for key decision-making elements. More than 60% of employees indicated that they are familiar with the concept of a learning organization, which is increasingly discussed in relation to team learning, mutual trust, open information sharing, employee involvement in decision-making, creativity, stability, entrepreneurship, and adaptability to environmental changes. The Novak Public Open University was founded on the principles of lifelong learning, and as a result, 90% of employees reported being knowledgeable about this concept. The institution actively participates each year in the national educational campaign organized by the Agency for Vocational and Adult Education, known as "Lifelong Learning Week." This initiative, which has been celebrated since 1999 at the behest of UNESCO, aims to raise awareness about the importance of learning and education. The week is structured as an educational campaign through which citizens are informed via various mass media platforms (including the Internet, daily newspapers, radio, and television) and through direct engagement (including activities such as lectures, workshops, round tables, concerts, fairs, exhibitions, and bicycle races) to convey the importance of lifelong learning (Vučić et al., 2023). All ten employees agreed that the learning and acquisition of new competencies by the educational institution's staff benefit the students. For example, there is a continuous knowledge assessment every four years for employees working as driving instructors in driver training programs to maintain their licenses. Additionally, the Agency for Vocational Education and Training conducts training sessions in adult education, in which both teaching and non-teaching staff from educational institutions actively participate. All acquired knowledge and skills are effectively integrated into the operations of the educational institution.

The main obstacles to continuous (lifelong) learning for teaching and non-teaching staff at the People's Open University Novak include a lack of time, a divided sense of motivation among employees, insufficient investment in material resources, and a lack of motivation among adult education participants. The results of the survey can provide valuable insights that may help reorganize responsibilities among employees to ensure that everyone has adequate time for personal development. By doing so, employees are likely to become more motivated, fostering innovative solutions for improving material resources through collaborative ideas. This, in turn, could enhance the motivation of potential participants in adult education. The concepts of a learning organization and lifelong learning are deeply interconnected, as both emphasize the continuous acquisition of knowledge and the development of skills as essential elements for long-term success and adaptability in a dynamic environment. According to the survey results, all ten employees of the People's Open University Novak share this perspective. They are committed to providing lifelong education to students, regardless of age, position, or circumstances, through formal, informal, and non-formal learning. They work in an environment where learning and knowledge sharing are fundamental values. Continuous learning within the organization fosters innovation, as employees introduce new knowledge and ideas. Lifelong learning ensures that employees maintain up-to-date skills that are necessary for remaining competitive in the market.

3.4. Research limitations and recommendations fur future research

This research provides an overview of the concepts of learning organizations and their practical implications within a higher education institution in Croatia. One of the notable shortcomings of the study is the limited sample size.

The authors recommend expanding the research to include more higher education institutions within the same field to gain a more comprehensive understanding of the state of learning organizations and their associated concepts. Additionally, it would be valuable to analyze the concepts of knowledge management and learning organizations by comparing experiences from multiple countries.

4. CONCLUSION

The concept of lifelong learning is crucial for all organizations, particularly for adult education institutions. With the knowledge and skills acquired through lifelong learning, employees can adapt to the changing environment, thereby realizing the long-term goals and aspirations of the educational institution—such as building and strengthening competitive advantage, thriving in the educational market, and fostering teamwork around a common vision. Learning is not confined to formal education at specific stages of life; rather, it is a continuous process that occurs throughout one's lifetime. In a rapidly evolving world, acquiring new knowledge, competencies, and skills is essential for both professional and personal growth. The idea of lifelong learning encourages individuals to adapt to environmental changes, take initiative in their learning, explore new topics, and enhance existing skills. The empirical research conducted at the Novak Public Open University assessed the development and progress of the concept of a learning organization, which is built upon the foundations of lifelong education and learning. The study highlighted how these two concepts are closely interconnected with the process of knowledge management. Both concepts emphasize the continuous acquisition of knowledge and the development of skills as key elements for long-term success and adaptability in a dynamic environment. Employees at the Novak Public Open University engage in lifelong education with participants of all ages, positions, and circumstances, utilizing formal, informal, and non-formal learning methods. They operate within a culture that prioritizes learning and knowledge sharing as fundamental values. Continuous learning within the organization fosters innovation, as employees introduce new knowledge and ideas, while lifelong learning ensures that they maintain up-to-date skills necessary to remain competitive in the market.

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TWO DECADES OF BECOMING SUSTAINABLE - CITY OF KOPRIVNICA LONGITUDINAL CASE STUDY

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ABSTRACT

The concepts of smart, sustainable, and resilient cities are incorporated into strategic and planning documents periodically adopted and implemented by municipalities. This paper presents the application of ISO 37120 in the sustainable development process of the City of Koprivnica (Croatia). The research is focused on selection of measurement model for monitoring sustainability, developing the system of collecting data necessary for calculation of indicators and enhancing quality of data sources. There are two sets of hypotheses, and the research methodology that consists of nine phases: measurement model selection, recognizing the indicators and data relevant to calculate them, determination of data sources, and three measurement cycles. This paper also provides a longitudinal view of indicators, with the analysis of the achievements of goals, including challenges during pandemic years, as well as an analytical and critical review of the development priorities, strategic goals, and indicators from the new strategic development documents of the City of Koprivnica, as well as the envisaged measures. The challenge of becoming sustainable has been measured by using objective, generally applicable methodology established by ISO that assures the comparability and competitiveness to other cities.

Keywords: *ISO 37120, Smart City, Sustainability, Sustainable Development, Quality of Life.*

1. INTRODUCTION

Sustainable development is a global challenge that implies activities for progress focused on saving natural resources, the safety of people and property. Digital technologies and their applications support the transformation of community's actions towards sustainable, inclusive, and smart goals. Ahvenniemi et al. (2017) explored the distinction between sustainable and smart cities. By 2050, around 68% of the global population will live in urban areas, as estimated by the United Nations (2018). Urbanization leads to development but also brings carbonization pollution and climate-related impacts. To counter these, the European Union initiated the Smart City initiative, urging cities to adopt technological solutions for better urban management. Smart city principles are employed in domains like "sustainable urban mobility, districts, and the built environment, integrated energy infrastructures and processes, information and communication technologies, citizen focus, policy, integrated planning, knowledge sharing, performance metrics, open data governance, standards, business models, and funding" (EC, 2011).

In the past 30 years, organizations like ISO, OECD and EU bodies (European Commission, Parliament, and Council) have developed frameworks to promote sustainable development. The ISO 37120 standard provides indicators for city services and quality of life to help cities track sustainable development (ISO, 2014). OECD organized roundtables on smart city measurement (OECD, 2020). In 2019, the EU adopted the Taxonomy Regulation, classifying environmentally sustainable economic activities and investment impact. All three frameworks contribute to sustainability, but target different subjects. The ISO standard and OECD roundtables involve cities, while Environment-Social-Governance (ESG) approach to sustainability includes business entities. The ISO standard, being the oldest framework, offers a standardized methodology for measuring city performance. This framework is more comprehensive than OECD and ESG. The optimal approach for urban communities would be to adopt all three concepts, creating benefits for all sectors (administration, economy, and citizens).

The OECD continually communicates with the economic sector and local governments to establish a useful model for measuring smart city performance. The suggested indicators are aligned with the four smart city objectives: well-being, inclusion, sustainability, and resilience. In 2023, the focus is on achieving net-zero emission in smart cities.

ESG is based on three fundamental dimensions. The first is focused on the environment, considering the impact of the company on the environment. This includes greenhouse gas emissions, energy efficiency, pollution levels, biodiversity conservation, afforestation, wastewater management, and other environmental issues. The second dimension relates to the social dimension, such as employee satisfaction, their health and safety, diversity and inclusion of all members of society, conflict prevention and resolution, working conditions, customer relations and satisfaction, and other social issues. The third-dimension concerns governance, relating how the company is managed and governed. This involves bribery and corruption prevention, management and supervisory boards effectiveness, their diversity, privacy protection, cybersecurity, stakeholder participation in decision-making, and more.

This study focuses on the case study of the City of Koprivnica, which aims to establish a comprehensive sustainability monitoring system. Setting sustainable community objectives and improving quality of life (QoL) are central to Koprivnica's local policy. By implementing the ISO 37120 standard, Koprivnica can benefit from comparing itself with other certified cities and self-monitoring its progress and changes.

The following paragraph provides a brief overview of the strategic planning practices in the Republic of Croatia. It introduces how the City of Koprivnica planned its development from 2010 to 2030.

The first law for regional development was enacted in 2009. Over time, local self-government also became responsible for strategic plans (Article 15, Code of Civil Procedure). Following Article 14 of Croatia's Law on Regional Development (OG 147/14), the City of Koprivnica made a Development Strategy (2015-2020), highlighting sustainable, inclusive, and intelligent growth (Koprivnica, 2015). This strategy, rooted in situational and environmental analysis, significantly contributes to national and European global objectives. Following the 2015-2020 period, the City of Koprivnica launched a new strategic document, titled "Development Strategy of the City of Koprivnica until 2030" (Koprivnica, 2022). This strategy maintains the development momentum, aiming to continuously improve QoL through a "Green and Digital" approach.

The chapter dedicated to research methodology outlines the longitudinal research approach and the specific methods employed to ensure consistent data collection, data processing for indicator calculation, source verification, comparison, and presentation of developmental progress. A separate chapter details the longitudinally measured indicator sample, organized by topic.

2. RESEARCH MOTIVATION AND GOALS

"*I often say that when you can measure what you are speaking about, and express it in numbers, you know something about it; but when you cannot measure it, when you cannot express it in numbers, your knowledge is of a meagre and unsatisfactory kind; it may be the beginning of knowledge, but you have scarcely, in your thoughts, advanced to the stage of science, whatever the matter may be*." - Lord Kelvin, Lecture on "Electrical Units of Measurement" (3 May 1883), published in Popular Lectures Vol. I, p. 73

Local government and the local economy are closely intertwined in the regions under the jurisdiction of that local self-government. The economy, through production and sales, generates value for business owners and employees. The local government ensures methods to enhance living and economic conditions in its area. Therefore, there is a clear positive feedback loop between local government and the economy. With increased tax contributions from economic growth, the local government can enhance citizen services. Simultaneously, a growing economy can employ the local workforce, establishing and sustaining a presence in the region.

During the project's initial phase in 2010, the City of Koprivnica carried out numerous activities and development endeavours funded by the EU. These activities served as an incentive for initiating and executing projects aimed at enhancing sustainable urbanization and the QoL within the city. The examples worth to mention are in:

- biodegradable waste management (Komunalac, 2011),
- urban green mobility project Civitas Dyn@mo in 2013 (Komunalac, 2013),
- transport infrastructure and the establishment of bicycle for recreational pursuits in 2014 (Grad Koprivnica, 2014).

All of these activities required the prompt implementation of a measurement model and processes to monitor their impact on citizens' well-being, carbon emissions, and sustainable urbanization.

At that time, none of the accessible initiatives offered a suitable open methodology for direct adoption in Koprivnica without significant changes. The team concluded that a proprietary model wasn't feasible due to resource constraints for conducting comprehensive research. Proprietary models also lacked a possibility of city comparison. In 2012, ISO/TC 268 started developing an ISO standard for sustainable community development, working on methodologies for indicators measuring city service performance and QoL, later published as ISO 37120:2014. The team closely tracked the standard's development and started implementing it as soon as it was released in May 2014. The researchers have been motivated by the opportunity to establish a systematic measurement model for monitoring changes and tracking sustainable development (EC, 2011) for Koprivnica. The goal was to establish an objective, measurable, and comparable global indicator-based measurement model, monitoring Koprivnica's Smart City sustainable development and QoL from 2010 to 2030.

Based on expressed motivation and set research goal the researchers set the following research questions:

RQ1: Which measurement model shall be developed or adopted for monitoring of sustainable development in the City of Koprivnica?

RQ2: Which data must be collected?

RQ3: Which data sources for calculation of measurable indicators must be used to assure reliability and verifiability of data?

Research Hypotheses:

H1: Implementation of (developed/adapted) measurement model enables tracking development towards sustainable and inclusive smart city.

H2: Implementation of a standardized measurement model enables ranking of the city's results in comparison to other cities.

3. RESEARCH METHODOLOGY

The research methodology has been designed and conducted through following phases:

Phase 1: Measurement model selection
Phase 2: Recognition, understanding and selection of indicators
Phase 3: Determination of data sources
Phase 4: Initial measurement and certification process conducted in 2016
Phase 5: Second measurement for tracking changes in the sustainable development in 2017
Phase 6: Analysing the results of second measurement conducted in 2017
Phase 7: Measurement for tracking changes in the sustainable development - third measurement in 2023
Phase 8: Analysing the results of third measurement in 2023, and comparison of three indicators values in three points of time
Phase 9: Making the conclusion and giving feedback to city authorities about the results of measurement to consider actual strategic goals and their potential achievement by 2030.

The research process and findings are presented in a separate chapter according to the defined research methodology.

3.1. Research sample

According to the timeline of the research project, all defined indicators were measured, contingent on accessibility to artefacts. Table 1 – column 3 - presents a sample of indicators that were measured three times during the research.

3.2. Research findings

Phase 1: Measurement model selection

The benefits of employing ISO 37120:2014 include the consistent and methodologically standardized measurement of indicators, ensuring result comparability and tracking changes within the same system, along with the system's comparability to others over the same timeframe (benchmarking). These application advantages serve as a central motivating factor for choosing to implement ISO 37120. The measurement model relies on the ISO 37120 methodology (ISO, 2014) (ISO, 2018), which was initiated in 2016, building upon development outcomes accomplished from 2010 to 2015. Subsequent measurements were conducted in 2017 and 2023. The subsequent measurement is scheduled for 2030 or a year following the expiration of the program period in 2030 or 2031.

The development process described earlier, founded on strategic planning and the vision of sustainable, smart, and inclusive growth, along with the motivation to quantify and continuously monitor the City of Koprivnica's progress, including indicators for assessing citizens' QoL, led to the adoption of the Conclusion on the implementation of ISO 37120:2014 by the mayor (CLASS: 402-08/16-01/0033, REG.NO.: 2137/01-05/01-16-01 of 14 March 2016). Regarding this, in 2016, the Mayor of Koprivnica initiated the certification project according to the ISO 37120 standard. The research methodology is grounded in the application of the ISO 37120 methodology, reflecting shifts in QoL over time through indicators. QoL is frequently emphasized by global organizations such as OECD, WHO, EUROSTAT, and the comparability of these approaches is outlined by Zdjelar in Table 4 - Comparison of frameworks of QoL (Zdjelar et al., 2021). Measuring QoL involves tracking 100 indicators with calculations mandated by the standard, ensuring benchmarking for all cities with ISO 37120 certification.
From citizens' perspectives, benchmarking is crucial as it assists in decision-making for residential choices, while investors gain insights into where to invest and which projects to support, especially when combined with the Open Data (OD) approach (Kelemen et al., 2017).

Phase 2: Recognition, understanding and selection of indicators
The ISO 37120 measurement methodology is established within the standard itself, outlining the necessary data to be collected. The researchers delved into this methodology, specifying the precise interpretation of the data. The determination involved identifying the required data and providing a precise and clear description to facilitate unambiguous communication and exchange of requested data between researchers and data providers. The researchers also defined the following aspects for all data:

- The period from which the data is sought and its accessibility.
- Establishing the data monitoring frequency at the source (e.g., annual, periods up to one year, multiannual).
- Indicating whether the data is publicly available and if so, in which format.
    - Publicly available in an online registry (searchable online database).
    - Publicly available in a published report (PDF).
    - Publicly available upon request (email, letter).
    - Kept as internal records.
    - Not available or does not exist.

Phase 3: Determination of data sources
In that part of research, researchers revealed and recorded the competent institution responsible for monitoring each piece of data. The institutions responsible for monitoring the data necessary for calculating indicators in this survey are grouped at the national, regional, and local levels. It has been particularly useful to identify the data (and indicators) that reflect the results of local government policy activities. These indicators are potentially the best way to improve the final score. For the indicators sample, the data sources are specified in Table 1. Column 7.

Phase 4: Initial measurement and certification process conducted in 2016
The research process of collecting data for calculating some indicators is demanding in the sense that the data for calculation are not directly available in the required format. Instead, they need to be generated by the relevant institutions to become usable (e.g., data on the duration of planned and unplanned electricity supply interruptions).

Furthermore, in the calculation of certain indicators, it is necessary to aggregate data from multiple institutions (e.g., the number of doctors per 100,000 inhabitants; the number of employees in emergency services). This is due to the hierarchical organization of certain activities in Croatia (e.g., healthcare, citizen protection, and safety) into different levels (e.g., primary, secondary, and tertiary healthcare, or fire service and police). All indicators are presented as relative numbers or percentages.

The initial measurement was conducted in 2016, based on the available data for all indicators that could be documented (94 out of 100). The situation observed in 2016 reflects the sustainable development measures that were implemented since the beginning of the millennium and carried out in the decade before the first measurement.
When the data were collected, the value of each indicator had been calculated (Table 1., column 4.). Once all indicators for which data had been obtained were calculated, references and data sources were systematically organized according to the indicator code numbers. The final verification of the calculations and the input of indicator values into the World Council on City Data (WCCD) information system were then performed. After an audit checks and confirms the sources, and possibly approves answers following clarifications, a certificate is issued based on the number of documented indicators. According to ISO 37120:2014, a set of 100 indicators is prescribed, out of which 46 are mandatory and 54 are optional. Depending on the number of optional indicators fulfilled, candidate cities can achieve certification ranging from bronze to platinum levels. The City of Koprivnica documented all 46 mandatory indicators and 48 additional indicators, totalling 94 indicators, thereby attaining the platinum certificate. These indicators, as per ISO 37120:2014, are grouped into 21 categories, each containing both mandatory and optional indicators. After the first measurement, the City of Koprivnica achieved the ISO 37120:2014 Platinum level certification (Grad Koprivnica, 2016). Simultaneously with the certificate issuance, all documented indicators and their values become publicly available to users worldwide with access rights on the WCCD portal (dataforcities.org). This allows for visibility, comparability, and stimulates public as well as investor interest. Subsequent measurements were significantly expedited due to the insights gained during the initial measurement, making the process more efficient.

Phase 5:
Second measurement for tracking changes in the sustainable development in 2017
One year after certification, the project team checked the revision of ISO 37120:2014 and found that the norm edition had not changed. To evaluate the model's performance, data collection and selection were carried out for the second measurement. During 2017, the data collection process was notably simpler due to the familiarity and effective organization of the collection system. The institutions from which data needed to be collected were already acquainted with the data requirements, the purpose of the collection, and the method of preparing and submitting the data upon request. Data that was publicly available, either through the website in a machine-readable format or as a report, was collected without the involvement of third parties. The results are presented in Table 1. column 5. Following the procedure previously outlined, the data collection was followed by indicator calculations. Certification was intended to be conducted annually, presenting a limitation to the chosen measurement model. The costs associated with certification constituted significant expenses, and the certificate itself in 2017, unlike today, held recognition at the level of financial sources (such as the EU, banks, etc.) as a factor that contributed to a certain prioritization when granting assistance.

This pertains to EU funds and other forms of financial aid required to promote sustainable development and implement projects aligned with that goal.

Phase 6: Analysing the results of second measurement conducted in 2017

When comparing the results of research, data collection, and of the process of measurement, multiple indicators significantly influence the sustainable urban development paradigm, assuming a highly pivotal role within said progression. Within the economic sphere, a notable reduction in unemployment rates is discernible within a year, shifting from 10.37% to 7.58%. Additionally, a significant decrease in unemployment figures among individuals under 24 years of age is observed, declining from 8.50% to 5.68%. Concurrently, a drastic surge in the number of entrepreneurs is evidenced, escalating from 1626.0689 to 3942.0834 per 100,000 inhabitants. This particular metric is normalized to a scale of 100,000 residents for the purpose of global comparability. Within the domain of safety, an increase in the count of professional firefighters is recorded, rising from 220.26 to 233.221 per 100,000 inhabitants. Simultaneously, a decline in the incidence of criminal offenses is noted, subsiding from 353.07 to 343.35 per 100,000 residents. During the year of measurement, local elections were conducted, resulting in an augmented voter turnout in comparison to the year 2016, manifesting as an escalation from 31.39% to 40.91%. In the same election year, which directly contributes to the measurement and its outcomes, the proportion of female participation decreased from 38.10% to 33.33%. Positive trends are identified in the healthcare sector, notwithstanding a consistent number of hospital beds; the count of physicians has risen from 816.27 to 991.19 per 100,000 inhabitants. While the majority of indicators, or rather, outcomes, have remained static or akin to those of the preceding year, it is paramount to highlight the surge in Internet connectivity rates, ascending from 50,628.40 to 53,849.19 per 100,000 residents within the span of one year. The same level of accessibility to public water supply has been sustained, accompanied by a slightly diminished water consumption per capita per day (110 to 107.78 liters). Nonetheless, there has been a reduction in the average annual number of hours of water supply disruptions for households, declining from 0.54 hours to 0.4372 hours per year per household.

Phase 7: Measurement for tracking changes in the sustainable development - third measurement in 2023

The current version of the norm is the ISO 37120:2018 series, which encompasses the "Sustainable Development of Communities" defined by City Services and QoL indicators. Furthermore, the norm comprises two subordinate standards: ISO 37122 – indicators for Smart Cities and ISO 37123 – indicators for Resilient Cities. The current version of ISO 37120:2018 standard is categorized into 19 topics, each measured by 104 indicators. Comparability between the measurements conducted in 2016, 2017, and 2023 is ensured because the authors of this research have focused on indicators that have not undergone changes in their structure and purpose. The results are presented in Table 1. column 6.

Phase 8: Analysing the results of third measurement in 2023, and comparison of three indicators values in three points of time

Consequently, it is evident that, in terms of the Environment, the percentage of the population connected to the public electricity grid increased from 96.58% in 2016 to 97.00% in 2022.

In field of waste management, the total mass of collected municipal waste decreased from 0.30 tons to 0.14 tons per capita, while the percentage of recycled waste simultaneously increased from 26.29% to 63.00%.

During the comparative period, the same percentage of the population had access to the public sewerage system and improved sanitation, standing at 95% of the city of Koprivnica's population. The consumption of water from the public water supply increased from 110 liters to 121.13 liters per capita per day. Additionally, the number of hours of disruption in the public water supply system decreased from 0.54 hours to 0.27 hours per household per year. Regarding air quality and climate changes, the percentage of suspended particles PM2.5 increased from 15.5 µg/m3 in 2016 to 22.71 µg/m3 in 2022. However, the percentage of nitrogen dioxide decreased from 13.6 to 11.8 µg/m3, as well as the percentage of sulphur dioxide from 4.6 to 4 µg/m3. Indicators classified within the social sphere reveal that the number of students in primary education has increased from 97.32% to 99.42%, and the percentage of students completing secondary education has risen from 87.34% to 99.81%. In the field of education, the student-to-teacher ratio has decreased from 13 to 12.25 students per teacher. The percentage of the population without adequate housing has remained at 0.03%, as well as the percentage of the population living below the international poverty line at 14.77%. Regarding healthcare, the number of hospital beds has increased from 997.66 to 1,077.67 beds per 100,000 inhabitants, while the number of medical personnel has decreased from 816.27 to 591.32 per 100,000 inhabitants. Sports and recreation have shown growth in the area of outdoor and indoor sports facilities. The surface area of closed recreational spaces per capita has increased from 3.58 to 3.87 m2, and open spaces from 0.11 to 0.23 m2 per capita. The final section pertains to indicators describing the economic situation. The unemployment rate has decreased from 10.37% to 3.44%, and simultaneously, the percentage of young unemployed individuals has dropped from 8.50% to 5.70%. A significant data point is that the number of business entities has increased from 1626.06 to 2774.66 per 100,000 inhabitants. In the realm of finances, the percentage of taxes collected has risen from 78.50% to 95%, while the share of own revenues in total income has declined from 70.58% to 48.27%. The number of professional firefighters, directly related to public safety, has increased from 220.26 to 262.42 per 100,000 inhabitants. The number of property-related criminal offenses has increased from 353.07 to 370.88 per 100,000 inhabitants. Regarding local elections, the number of voters who participated in the elections has risen from 31.39% to 38.85%, while the percentage of women on local electoral lists has decreased from 38.10% to 33.33%. Managing the local community also includes transportation, where there is a noticeable increase in public transport usage from 0.0061 to 0.2 trips per capita per year. The data on traffic-related fatalities shows an increase from 0 to 7 casualties per 100,000 inhabitants.

Phase 9: Making the conclusion and giving feedback to city authorities about the results of measurement to consider actual strategic goals and their potential achievement by 2030

After comparing the measurement results based on indicators, it is possible to draw conclusions from the trends in these outcomes. In addition to drawing conclusions from results over a time period, it is also possible to compare with other units of local government. Conclusions can lead to recommendations for local policy makers to improve decisions that directly impact QoL, environmental preservation, or entrepreneurship stimulation. In the provided example, it's significant to realize that an increase in the number of businesses very likely contributes to a decrease in unemployment. This is an indicator for the local government to develop programs and measures to promote entrepreneurship, such as through the establishment of entrepreneurial zones, incentivized leasing or purchasing prices for land in business zones, measures for start-ups, micro and small entrepreneurs, and so on.

It can be assumed that increased economic activity resulted in higher levels of fine particulate matter (PM2.5), hence it's necessary to pay attention to environmental protection by implementing measures to mitigate this impact. Greater economic activity led to reduced municipal administration debt and there's also noticeable improvement in local tax collection efficiency. A recommendation is to direct the increased inflow of tax revenue towards promoting entrepreneurship and investing in citizens' QoL.

Each of the monitored indicators serves as a direct input parameter for decision-making, planning, and strategies for every future period. Since measurements can be done on an annual basis, some decisions can be made swiftly to influence outcomes in the short term, with the longest effect lasting until the end of the observed period, i.e., until 2030.
Measured values of indicators (research sample) according the time is presented in Table 1., as well as the data sources. Based on the results of the research presented in Table 1 columns 2016, 2017 and 2023, the hypothesis H1 can be confirmed.

To document the facts on assuring the comparability on international level it should be used the indicators values recorded in WCCD portal (https://dashboard.dataforcities.org/login). According to the sample of indicators in this research some comparation are selected from the total of indicators and presented in Table 2. By presenting comparability on objective and measurable way between cities that implement ISO 37120 the hypothesis H2 is confirmed.

Table 1: Measurement results in period 2015-2023 and data sources (Source: Zdjelar Robertina and Dario Jembrek, authors)

Ord. Num.	**INDICATOR (research sample)**	**CALCULATION – RQ2**	**RESULT 2016.**	**RESULT 2017.**	**RESULT 2023.**	**Source (RQ3)**
1	2	3	4	5	6	7
ECONOMY						
1.	**City's unemployment rate**	The number of working-age city residents who are not in paid employment or self-employment, but available for work and seeking work in the past 4 weeks divided by the total labor force and by 100 and expressed as a percentage.	10,37%	7,58%	**3,44%**	National level - Croatian Employment Institute
2.	**Youth unemployment rate**	The total number of unemployed youth (youth under 24 who are actively seeking work in the past four weeks) divided by the youth labor force	8,50%	5,68%	**5,70%**	National level - Croatian Employment Institute
3.	**Number of businesses per 100 000 population**	The total number of businesses in a city divided by one 100 000th of the city's total population	1.626,06/ 100000	3942,0834	**2.774,66/ 100.000**	National level - Central Bureau of Statistics, Croatian Chamber of Commerce
EDUCATION						
4.	**% of students completing primary education: survival rate**	The total number of students belonging to a school who completed the first grade of primary education divided by the total number of students who reached the final grade of primary education; result multiplied by 100 and expressed as a percentage.	97,32%	97,32%	**99,42%**	Local level – City of Koprivnica; Regional level – Koprivnica-Križevci county
5.	**% of students completing secondary education: survival rate**	The total number of students belonging to a school who completed the first grade of secondary education divided by the total number of students who reached the final grade of secondary education; result multiplied by 100 and expressed as a percentage.	87,34%	100,00%	**99,81%**	Regional level – Koprivnica-Križevci county

6.	**Primary education student/teacher ratio**	The number of enrolled primary school students divided by the number of full-time equivalent primary school classroom teachers	13	12,25	**12,25**	Local level – City of Koprivnica
ENERGY						
7.	**% of city population with authorized electrical service**	The number of persons in the city with lawful connections to the electrical supply system divided by the total population of the city; the result multiplied by 100 and expressed as a percentage.	96,58%	96,58%	**97,00%**	National level - Central Bureau of Statistics
ENVIRONMENT AND CLIMATE CHANGE						
8.	**Fine particulate matter (PM2.5) concentration**	The concentration of PM 2.5 in microgams per standard cubic meter; annual average	15,5 µg/m3	15,5 µg/m3	22,71 µg/m3	National level - Croatian Environment Agency Local level – City of Koprivnica
9.	**Nitrogen dioxide (NO2) concentration**	The sum of NO2 concentration in micrograms per m3 for the whole year divided by 365 days; annual average for daily NO2 concentration	13,6 µg/m3	13,6 µg/m3	**11,8** µg/m3	Regional level – Koprivnica-Križevci county
10.	**Sulphur dioxide (SO2) concentration**	The sum of SO2 concentration in micrograms per m3 for the whole year divided by 365 days; annual average for daily SO2 concentration	4,6 µg/m3	4,6 µg/m3	**4** µg/m3	Regional level – Koprivnica-Križevci county
FINANCE						
11.	**Own-source revenue as a percentage of total revenues**	The total amount of funds obtained through permit fees, user charges for city services, and taxes collected for city purposes only, divided by all revenues; the result multiplied by 100 and expressed as a percentage.	70,58%	70,58%	48,27%	Local level – City of Koprivnica
12.	**Tax collected as a percentage of tax billed**	The total revenues generated by tax collection divided by the amount of taxes billed; the result multiplied by 100 and expressed as a percentage.	78,50%	78,51%	**95%**	Local level – City of Koprivnica
SAFETY						
13.	**Number of firefighters per 100 000 population**	The total number of paid full-time firefighters divided by on 100 000th of the city population.	220,26/ 100.000	233,221/ 100.000	**262,42/ 100.000**	Local level - Public fire-department
14.	**Crimes against property per 100 000**	The total number of all property crimes (burglary, larceny-theft, motor vehicle theft, arson) reported divided by one 100 000th of the total city population	353,0707/ 100.000/yr	343,35/ 100.000/yr	370,88/ 100.000/yr	Local level - City police station
GOVERNANCE						
15.	**Voter participation in last municipal election (as % of eligible voters)**	The number of persons that voted in the last municipal election divided by the city population eligible to vote; the result multiplied by 100 and expressed as a percentage.	31,39%	40,91%	**38,85%**	Local level – City of Koprivnica
16.	**Women as a % of total elected to city-level office**	The total number of elected city-level positions held by women divided by the total number of elected city-level positions; the result multiplied by 100 and expressed as a percent.	38,10%	33,33%	33,33%	Local level – City of Koprivnica
HEALTH						
17.	**Number of in-patient hospital beds per 100 000 population**	The total number of in-patient public and private hospital beds divided by one 100 000th of the city's total population	997,66 / 100000	997,67/ 100.000	**1.077,67/ 100000**	Regional level – Koprivnica-Križevci county
18.	**Number of physicians per 100 000 population**	The number of general or specialized practitioner whose work place is in the city divided by one 100 000th of the city's total population.	816.2736/ 100000	991,1894/ 100.000	591,32 / 100000	Regional level – Koprivnica-Križevci county

HOUSING						
19.	**% of city population living in -inadequate housing (core)**	The number of people living in slums (number of households in substandard or insecure housing multiplied by current average household size) divided by the city population; the result multiplied by 100 and expressed as a percentage.	0,03%	0,03%	0,03%	National level - Central Bureau of Statistics
POPULATION AND SOCIAL CONDITIONS						
20.	**% of city population living below the international poverty line (core)**	The number of people living below the povery treshold (as recorded by the World Bank) divided by the total current population of the city; the result multiplied by 100 and expressed as a percentage.	14,77%	14,77%	14,77%	National level - Central Bureau of Statistics
RECREATION						
21.	**Square meters of public outdoor recreation space per capita**	The square meters of outdoor public recreation space (city owned or other recreation land within the city) divided by the population of the city.	3.58 m2/capita	3,5864 m2/capita	**3,87** m2/capita	Local level – City of Koprivnica
22.	**Square meters of public indoor recreation space per capita**	The square meters of indoor public recreation space (city owned or other recreation buildings within the city) divided by the population of the city.	0.11m2/capita	0,1182 m2/capita	**0,23 m2**/capita	Local level – City of Koprivnica
SOLID WASTE						
23.	**Total collected municipal solid waste per capita per year**	The total amount of solid waste (household and commercial - with exclusion of sewage network waste and construction and demolition waste) generated in tonnes divided by the total city population.	0.30 t/ per capita	0,3003 t/capita	**0,14 t/ per capita**	Local level - Local utility company
24.	**% of the city's solid waste that is recycled**	The total amount of the city's solid waste that is recycled in tonnes divided by the total amount of solid waste produced in the city in tonnes; the result multiplied by 100 and expressed as a percentage	26,29%	26,29%	**63,00%**	Local level - Local utility company
TELECOMMUNICATION AND INNOVATION						
25.	**Number of internet connections per 100 000 population**	The number of internet connections in the city divided by one 100 000th of the city's total population.	50.628,40/ 100 000	53.849,19/ 100.000	**56.006,72/ 100.000**	National level - Croatian Regulatory Authority for Network Industries (HAKOM)
TRANSPORTATION						
26.	**Annual number of public transport trips per capita**	The total annual number of public transport trips originating in the city, divided by the total city population.	0.0061 capita/year	0,0061 per capita/yr	**0,2 per capita/year**	Local level - Local utility company
27.	**Transportation fatalities per 100 000 population**	The number of fatalities (deaths) related to transportation of any kind (automobile, public transportation, bicycling, walking, etc.) within the city borders, divided by 100 000th of the city's total population.	0/ 100.000	9,7/ 100.000	7/ 100.000	National level - City police station
WASTEWATER						
28.	**% of population with access to improved sanitation**	The total number of people using improved sanitation facilities divided by the total city population; the result multiplied by 100 and expressed as a percentage.	95%	95%	95%	Local level - Local utility company
WATER						

29.	**Total domestic water consumption per capita (liters/day)**	The total amount of the city's water consumption in liters per day for domestic use divided by the total city population. **only domestic use - water consumed for industrial and commercial purposes shall be excluded.*	110 l/capita/day	107,78 l/ capita/day	121,13 l/capita/day	Local level - Local utility company
30.	**Average annual hours of water service interruption per household**	The total sum of hours of interruption multiplied by the number of households impacted, divided by the number of households. Incidents of complete shutoff, low flow restrictions, boil water advisory, water main flushing, planned and unplanned interruptions are included.	0,54 hrs/yr/ household	0,4372 hrs/yr/ household	**0,27 hrs/yr/ household**	Local level - Local utility company

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Table 2.: Indicators value of City of Koprivnica to other cities according WCCD ISO 37120 (Source: Komunalac d.o.o (2017), https://dashboard.dataforcities.org/)

Indicator	Koprivnica	Compared city	
Number of internet connections per 100 000 population (2016)	50.628,4	21.181,30	Dubai
		49.642,00	Amsterdam
		72.423	Boston
Number of businesses per 100 000 population (2016)	1.626,07	6.031	Dubai
		9879	Amsterdam
Transportation fatalities per 100 000 population (2016)	0	1,36	Barcelona
Nitrogen dioxide (NO2) concentration (2016)	13,6 µg/m3	29.89 µg/m3	Bogota
		28.02 µg/m3	Los Angeles
City's unemployment rate (2016)	10,37%	5,3%	Boston
		4,7%	San Diego
Youth unemployment rate (2016)	8,5%	13.6%	Boston
		7,8%	Melbourne
		21,6%	Toronto
Total domestic water consumption per capita (liters/day) (2016)	110 l/capita/day	100.88 l/capita/day	Haiphong
Total collected municipal solid waste per capita per year (2016)	0.30 t/ per capita	0.30 t/ per capita	Haiphong
Fine particulate matter (PM2.5) concentration (2016)	15,5 µg/m3	14.2 µg/m3	London
		8,96 µg/m3	Toronto
		19,6 µg/m3	Taipei

4. LIMITATION AND FUTURE RESEARCH

In collecting data for this study, as well as in its subsequent analysis, it is understandable that there are limitations that could have influenced the final results. Specifically, the implementation of the ISO standard over the past ten years has been carried out in very few cities in Croatia (Rijeka, Dubrovnik). On the other hand, the human and technological capacities of local administration, and sometimes financial constraints, pose obstacles to the implementation of proposed measures to achieve the specified indicators. Furthermore, in 2023, there are still limitations on data accessibility and open data platforms, which are often either unavailable or only partially accessible. The owners of databases have to give especial permition for access and further use to users. Frequently, the data obtained are not in a suitable format for further analysis and processing, necessitating data adaptation to a form appropriate for the purpose of this study. Aware of these limitations, public administration should continue developing open data platforms that not only contribute to transparency but also enable their use in the continued development of cities, municipalities, as well as public and private companies. Authors find it important to mention that there exist other contemporary trends that shape and oversee community sustainability from the perspectives of environment, social responsibility, and governance. The inception of this concept dates back two decades.

The current approach is termed the Environment-Social-Governance (ESG) business approach, and within the European framework, public authorities are presently engaged in the development and promotion of a taxonomy aimed at ensuring standardization in gauging the extent of developmental sustainability and the responsibility towards future generations. The principal distinction between the ESG concept and the ISO 37120 sustainability monitoring concept lies in the fact that ISO 37120 is precisely oriented towards local government (specifically cities, not municipalities), whereas ESG is becoming or will become obligatory for economic entities. The authors intent to make a new direction in the research of monitoring sustainability by comparing the advantages of implemented ISO 37120 with the ESG methodology and OECD methodology.

5. CONCLUSION

Considering the research questions and hypotheses, conclusions have been drawn that the ISO 37120:2014 and/or 37120:2018 standard has proven to be a quality tool for measuring the sustainability and success of local self-government, as it uniquely provides a model through which this can be monitored. From the very list of indicators in the ISO 37120 standard, it is predetermined what data needs to be collected, or rather, what information needs to be acquired to determine, measure, or calculate the indicators value. So far, there has been one amendment to the standard that eliminated certain previous indicators and introduced new ones. Nevertheless, it is still possible to compare results easily and effectively from previous years with the current ones. The research has shown that not all data is publicly available, not all data is in a suitable format for indicators, or some data simply doesn't exist. As this concerns a small amount of inaccessible data, its impact on the overall result is nearly negligible. To improve this situation, it is necessary to digitize databases, enable open access, search, sorting, and extraction of data and information in a machine-readable format, and store them in online locations that are accessible, reliable, and permanent.

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INTELLIGENCE ANALYSIS TECHNIQUES AND CRITICAL THINKING IN COUNTERING INFORMATION DISORDERS

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ABSTRACT

In countering information disorders - which include disinformation, misinformation and malinformation - and fake news, intelligence analysis tools are evidently useful and efficient. Nevertheless, it is of utmost importance to bear in mind the variety of intelligence analysis tools spectrum, and to use those tools in order to achieve geo and time transference along with the appropriate risk management (threat, vulnerability, probability, impact). The aim of the research is to provide solutions to problems of information overload and bounded rationality in collecting and analyzing information, primarily those found on the the internet. For this purpose, article will discuss examples of Structured Analytic Techniques, namely deception detection (MOM, Motive, Opportunity, and Means; POP, Past Opposition Practices; MOSES, Manipulability of Sources; EVE, Evaluation of Evidence), and critical thinking tools (Paul-Elder framework) in countering challenges of cognitive limitations, primarily those refering to perception, biases and memory.

Keywords: *intelligence analysis, information disorders, fake news, disinformation, misinformation, malinformation, deception detection, critical thinking.*

1. INTRODUCTION

Sudden and rapid changes in contemporary suurroundings are caused primarily by exponential curve of technological advances and enormous quantity of information generated daily *online* and *offline*. The assessment of the information has become a key challenge in discovering important insights and making correct judgement and conclusions about security reality, which has made analysis and its products the more important a component of decision-making processes. If it is good, analysis and its products can help lower risks in considering threats and possiblities in the area it covers, but also in national security in general. The task of the analyst is to connect various signals, events, observations, perceptions and data, and their integration into transparent patterns and trends using scientific and non-scientific methods and procedures to interpret data and/or information, discover important insights, develop valid conclusions and make useful and applicable recommendations for decision makers. Therefore, a good analyst must possess specific expert knowledge and skills, and have at his/her disposal an extensive set of methods, techniques and tools that will help him/her find answers to numerous questions on the abilities to overcome national security challenges. Besides, analyst's needs also include high quality data and the access to different credible data sources. Shakley (2006) stated that as a person in a managerial position, he obtained 80% of the data he needed from open sources, not classified data. And of the remaining 20% of data needs, if he knew what he was specifically looking for, he found an additional 14% in open sources. At the end of the day, at best classified information provided only 4% of the knowledge required for his managerial position[1].

[1] Shackley, Ted (2006) Spymaster: My Life in the CIA, Illustrated edition, POTOMAC BOOKS

When speaking about OSINT (*Open Source Intelligence*) and data collected through open sources, at the beginning of the fourth quarter of 2023, 5.30 billion people worldwide use the Internet, which makes up 65.7% of the world's population, of which there are over 750 million Internet users in Europe alone. Projections for the year 2024 say that two-thirds of the total world population will be online by the end of the year. The vast majority of these users globally use mobile phones to access the Internet[2]. At the same time, the average time we spend connected to the Internet increased by 0.9% compared to last year and amounts to 6 hours and 41 minutes per day, while, just for comparison, the average time spent watching television decreased by 13 minutes and amounts to 3 hours and 12 minutes. It is interesting that the time we spend on social networks has also decreased, amounting to a total of 2 hours and 24 minutes. This is the average time of respondents aged 16 to 64[3]. As for Croatia, according to Datareportal, at the beginning of 2023, 3.34 million (83%) citizens used the Internet, and even 73.1% (non-unique) citizens used social networks, respectively:

- Facebook – 1.75 million
- YouTube – 2.90 million
- Instagram – 1.45 million
- Linkedin – 730 thousand, which also recorded the highest growth in potential ad reach in Croatia by 90 thousand (+12.3 percent) between 2022 and 2023[4].

The same source states that at the beginning of 2023, 5.37 million mobile connections were active in Croatia, or 133.6% of the total population.
Eurostat data from 2021 confirm previous projections about the increase in news consumption via digital channels - 72% of internet users aged 16 to 74 in the EU read news portals, newspapers and informative magazines via the internet. The distribution by country reveals the highest percentage of online news readers in Finland (93%), Lithuania and the Czech Republic (both 92%), and Croatia and Greece (both 90%). In a survey of over 93,000 online news consumers in 46 markets covering over half of the world's population, the Reuters Institute's Digital News Report 2022 reveals a sharp decline in interest in news globally – from 63% in 2017 to 51% in 2022. Trust in news sources has also fallen in almost half of the countries, and it increased only in 7 of them. On average, 42% of respondents trust the news most of the time. Finland continues to top the list of countries with an overall trust of 69%. In the USA, trust is the lowest and is only 26%.[5] The above data show the potential impact of the Internet and social networks on the general information of citizens and indicate the importance of legislation and fact-checking tools in the fight against disinformation and fake news. Disinformation and fake news are increasingly used to manipulate public opinion with the help of modern technology, causing confusion, fear and uncertainty among consumers and weakening democratic societies. The need to attach increasing importance to this topic is a consequence, among other things, of frequent politically motivated intentions and criminal activities. Today, disinformation, fake news and hate speech are used to strengthen divisions in society, intensify crisis situations, cause political or economic damage and incite physical violence.

[2] Kemp, S. (2023) DIGITAL 2023 OCTOBER GLOBAL STATSHOT REPORT, https://datareportal.com/reports/digital-2023-october-global-statshot, Accessed: October 2023.
[3] Ibid.
[4] Kemp, S. (2023) DIGITAL 2023: CROATIA, https://datareportal.com/reports/digital-2023-croatia, Accessed: October 2023.
[5] WEF (2022) Most people get their news online - but many are switching off altogether. Here's why, https://www.weforum.org/agenda/2022/09/news-online-europe-social-media/, Accessed: October 2023.

The spread of disinformation and fake news is significantly facilitated, accelerated and enhanced by the use of artificial intelligence, and experts estimate that, if development continues at the current pace, by 2026 90% of the content published on the Internet will be synthetically created.[6] OSINT organizations and companies are trying to keep pace with the growing amount of information disruptions and identify and analyze related trends. With the help of new technologies and thanks to the intelligence efforts of the members and bodies of the European Union, the capacities for identifying the sources of disinformation campaigns and determining the origin of false information are gradually being improved, which makes it easier for the relevant bodies to create and apply adequate countermeasures. Although the concepts of disinformation and fake news are narrower than the concept of information disorders, which we will explain in the following text, for the purposes of this article, the phrase "disinformation and fake news" includes all other types of information disorders.

2. TYPES AND MOTIVES OF INFORMATION DISORDER

The Commission's recommendation of March 1, 2018 on measures to combat illegal internet content defines the term disinformation or fake news as "provably false or misleading information that is concocted, presented and disseminated for the purpose of obtaining economic benefit or intentionally deceiving the public, and that may harm the public interest. Damage to the public interest includes jeopardizing democratic political and policy-making processes, but also public goods such as the protection of EU citizens' health, the environment and security. Disinformation does not include reporting errors, satire and parody, as well as clearly indicated partisan news and commentary."[7,8] Satire and parody are not disinformation in their intention because they do not aim at deception and manipulation and most often the audience can distinguish that it is a comedy. Tandoc et al. mention contemporary discourse definition of fake news as "viral posts based on fictitious accounts made to look like news reports". A recent study by Alcott and Gentzkow defines fake news "to be news articles that are intentionally and verifiably false, and could mislead readers".[9,10] Similarly, McGonagle describes fake news as "information that is deliberately fabricated and disseminated to deceive and mislead others into believing fake news and questioning verifiable facts"[11]. In contrast to disinformation, misinformation or wrong information is defined as "misleading or incorrect information that people spread unknowingly".[12] In other words, misinformation is false or misleading content that is shared without harmful intent, although its effects can still be harmful. What distinguishes disinformation and misinformation is the intent to deceive.

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[6] EUROPOL (2022) Facing Reality? Law Enforcement and the Challenge of Deepfakes, An Observatory Report from the Europol Innovation Lab, European Union Agency for Law Enforcement Cooperation, p. 5; Schick, N. (2020) Deepfakes: The Coming Infocalypse: What You Urgently Need To Know, Twelve, Hachette UK

[7] Komunikacija Komisije Europskom Parlamentu, Vijeću, Europskom gospodarskom i socijalnom odboru i Odboru regija, Suzbijanje dezinformacija na internetu: europski pristup, travanj 2018., https://eur-lex.europa.eu/legal-content/HR/TXT/HTML/?uri=CELEX:52018DC0236&from=PL#footnote20. Accessed: 13 October 2023.

[8] Preporuka Komisije od 1. ožujka 2018. o mjerama za suzbijanje nezakonitih internetskih sadržaja (C(2018) 1177 final), https://ec.europa.eu/digital-single-market/en/news/commission-recommendation-measures-effectively-tackle-illegal-content-online. Accessed: 13 October 2023.

[9] Tandoc Jr., E. C., Jenkins, J. & Craft, S. (2018) Fake news as a critical incident in journalism. Journalism Practice, 13(6), 673–689. https://doi.org/10.1080/17512786.2018.1562958.

[10] Allcott, H. & Gentzkow, M. (2017) "Social Media and Fake News in The 2016 Election." Journal of Economic Perspectives 31 (2): 211–236. doi:10.1257/jep.31.2.211.

[11] McGonagle, T. (2017) "Fake news": False fears or real concerns? Netherlands Quarterly of Human Rights, 35(4), 203–209. https://doi.org/10.1177/0924051917738685

[12] HLEG (High Level Expert Group). (2018, March). A multi-dimensional approach to disinformation: Report of the independent high level group on fake news and online disinformation. Publications office of the EU. https://www.doi.org/10.2759/739290

And, finally, malinformation (malicious information) is true, accurate information that is shared with the aim of harming a person, organization or country[13]. Conceptual frame published in the report titled "*INFORMATION DISORDER: Toward an interdisciplinary framework for research and policy making*" by Claire Wardle and Hossein Derakhshan[14] uses a collective name and identifies three components of information disorders, each of which is divided into three parts:

1. Three types of information disorders: disinformation, misinformation, and malinformation.
2. Three phases of information disorders: creation, production, and distribution.
3. Three elements of information disorders: agents, message, and interpreter.

Authors define disinformation as "information that is false and deliberately created to harm a person, social group, organization or country". Misinformation is "information that is false, but not created with the intention of causing harm", whereas malinformation is "information that is based on reality, used to inflict harm on a person, organization or country"[15]. The guidelines from the document titled "Code of Practice on Disinformation" from 2018 by the European Commission marked the first global voluntary consensus on self-regulatory standards for combating disinformation.[16] The aim of the Code is to achieve the objectives outlined in the Commission's communication to the European Parliament, the Council, the European Economic and Social Committee, and the Committee of the Regions on tackling online disinformation[17], with 21 commitments from various areas, from various areas, from transparency in political advertising to the demonetization of disinformation distributors. The Code was signed in October 2018 by online platforms such as Facebook, Google, Twitter, and Mozilla, as well as advertisers and other industry players. In May 2019, Microsoft joined them, and TikTok signed the Code in June 2020. The coronavirus pandemic and the related infodemic is the best illustration of the threats and challenges of disinformation and fake news for the safety of individuals and society as a whole. The rapid spread of large amounts of incorrect, untrue and misleading information during the pandemic posed a significant risk and/or harmed the health of many citizens and threatened the public health system, made crisis management difficult and contributed to the collapse of social cohesion.

The pandemic accelerated and strengthened the penetration of technology into the everyday life of the general population, ways and forms of work, learning and socialization, provision of basic life needs and participation in civil discourse, and technology, consequently, enabled the infodemic to develop at an exponential rate. In such circumstances, there is a need to make the online ecosystem safe and to accelerate efforts to combat disinformation and fake news. In addition, the Commission's assessment of the implementation of the existing Code revealed inconsistent and incomplete application of the Code on different platforms and in member states, primarily due to the self-regulatory nature of the Code.

[13] Wardle, C. & Derakshan, H. (2017) Information disorder: Toward an interdisciplinary framework for research and policy making. Council of Europe report DGI (2017)09. https://rm.coe.int/information-disorder-toward-an-interdisciplinary-framework-for-researc/168076277c

[14] Wardle, C. & Derakhshan, H. (2018) INFORMATION DISORDER: Toward an interdisciplinary framework. 2nd revised edition, Council of Europe, p. 21.

[15] Ibid.

[16] EC Code of Practice on Disinformation, 2018. https://digital-strategy.ec.europa.eu/en/library/2018-code-practice-disinformation Pristup 13. listopada 2023.

[17] Komunikacija Komisije Europskom Parlamentu, Vijeću, Europskom gospodarskom i socijalnom odboru i Odboru regija, Suzbijanje dezinformacija na internetu: europski pristup, travanj 2018., https://eur-lex.europa.eu/legal-content/HR/TXT/HTML/?uri=CELEX:52018DC0236&from=PL#footnote20, Accessed: 13 October 2023.

The assessment also revealed a lack of adequate monitoring mechanisms, non-compliance with the obligation of free access to information for the purposes of research and fact-checking, and limited participation of stakeholders, especially those from the advertising sector. The European Commission reacted with more ambitious commitments and measures in the form of a revised version of the Code – *Strengthened Code of Practice on Disinformation 2022*[18]. The new Code brings together a significantly larger number of different stakeholders, encouraging their contribution to efforts to demonetize the spread of disinformation, guarantee the transparency of political advertising, strengthen cooperation with fact-checkers, and enable access to data for the purposes of researching the sources and actors of disinformation and fake news. Given that manipulative behaviors are evolving, the new Code includes a wider range of behaviors – fake accounts, the use of bots to boost disinformation campaigns, impersonation and malicious deep fake.

3. AGENTS OF DISINFORMATION CAMPAIGNS AND THEIR CHARACTERISTICS

The article primarily explores the challenges that disinformation campaigns and fake news bring with them and, in general, all kinds of information disorders from the perspective of human agents - recipients, but considering that in the specific case of misinformation, it is about distributors who unknowingly spread false information, we cannot draw a sharp line between these two types of agents. Challenges of analysis, such as the pressure of quick judgment, extremely unclear situations, increased amount of (received/processed) information, analysis paralysis or its opposite, sudden, thoughtless decisions based on a hunch, "gut feeling" - extinct by instinct and the analytical paradox (a situation when decision-makers are unable to accurately and precisely articulate their needs), which can be illustratively explained by the sentence "I can't tell you what I want until I know it," make unbiased judgment difficult. The common denominator of the mentioned challenges and at the same time an obstacle to a successful and effective analysis are the features of human judgement, which, in turn, is based on limited rationality - a concept that explains the limitations of human cognitive abilities in interpreting reality. The concept of bounded rationality was introduced into the discourse on economic decision-making by Herbert Simon[19,20] due to the need to supplement the neoclassical economic theory, which is based on the assumption that man is homo economicus and that he is completely rational at the time of making (economic) decisions. Full rationality requires unlimited cognitive decision-making abilities in an ideal world as prescribed by normative, traditional economic theory. However, real-world choices and decisions are much more realistically described by descriptive, behavioral theory. Behavioral economics extends and complements this assumption with the theory of bounded rationality, which better describes the decision-making of cognitively limited agents under conditions of risk and uncertainty. Behavioral economics thus brings into focus cognitive and informational limitations, the influence of emotions on decision-making, but also a different attitude towards (inter)temporal decisions. The concept of cognitive limitations refers to the way our mind perceives and processes information, forms judgments, selects evidence and facts, establishes cause-and-effect relationships and assesses probabilities, and how this affects our decisions and behavior.

[18] EC Strengthened Code of Practice on Disinformation 2022, reviewed version https://digital-strategy.ec.europa.eu/en/library/2022-strengthened-code-practice-disinformation Accessed: 13 October 2023.

[19] Simon, H. A. (1947) Administrative behavior; a study of decision-making processes in administrative organization. Macmillan

[20] Simon, H. A. (1957) Models of man; social and rational. Wiley

Kahneman[21] investigates the ways of making decisions under conditions of risk and uncertainty, and his idea is that the human mind is subject to systematic, consistent and predictable mental errors - heuristics and (cognitive) biases - which are a consequence of evolution and as such affect the way information is processed. The scientific research group led by Daniel Kahneman and Amos Tversky[22] explores explanations of bounded rationality in decision-making, often as consequences and manifestations of deviations from rationality, highlighting the shortcomings of human thinking. The other group, which emphasizes functionality and the "power of intuition", led by Gerd Gigerenzer[23], points out that human reasoning is satisfactory with regard to the environment in which that reasoning developed, insisting that the success of human reasoning depends on the situation in which it is used and that all our adaptations have evolved in order to solve specific problems that we have faced during evolution as a species. This thesis is further complemented by the psychological concept of cognitive miser, introduced by Susan Fiske and Shelley Taylor[24], which refers to the human mind's tendency to use minimal cognitive effort in processing information (using intuition instead of thinking, or, according to Kahneman, System 1[25]). Although stated as early as 1911, Alfred North Whitehead's quote that "civilization advances by extending the number of important operations which we can perform without thinking of them" excellently illustrates this concept. Apart from heuristics and (cognitive) biases, the concepts that play a significant role in the way the human brain processes information are perception, attention and memory. Any precise analysis requires precise perception. The process of perception connects us to our environment and is key to understanding the world around us. Perception is an active process that not only recognizes and records, but also creates our reality. In other words, perception is the process of creating conclusions based on which we create our own versions of reality using the information we gather through the senses[26]. Therefore, what analysts, and people in general, perceive and the way they perceive reality is strongly influenced by previous experiences, education, social norms and roles, and stimuli registered by the sense organs. Context also affects perception, meaning that different situations prompt different expectations and experiences. All the mentioned circumstances and influences will determine in advance which information the analyst will focus on and how he or she will organize and interpret the collected information. Accordingly, one of the fundamental problems with perception is that we see what we expect to see. Patterns of expectations are so deep that they influence perception even in situations where we are prepared and aware of the fact that there is data that does not fit our predictions. In other words, the intuitive, evolutionarily determined ways of gathering and processing information are consistent and predictable, but not entirely curable. Therefore, the analyst's judgments are based on a set of assumptions and expectations about the people and events he or she is analyzing, so data and information consistent with these assumptions and expectations will be easily perceived and processed, while contradictory ones will remain unnoticed and ignored. One of the cognitive biases we are talking about here is called confirmation bias - our mind easily perceives and processes information consistent with our preconceived attitudes, while completely ignoring the fact that there might be other, inconsistent information, and possibly in a significantly larger number.

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[21] Kahneman, D. (2013) Misliti, brzo i sporo, Zagreb: Mozaik knjiga; Kahneman, D., Sibony, O. & Sunstein, C. R. (2022) Buka, Zagreb: Mozaik knjiga

[22] Kahneman, D. & Tversky, A. (1979) Prospect Theory: An Analysis of Decision under Risk, Econometrica, Vol. 47, No. 2. (Mar., 1979), pp. 263-292.; Kahneman, D. i Tversky, A. (1984) Choices, Values, and Frames; American Psychologist, Vol. 39, No. 4, 341-350

[23] Gigerenzer, G. (2007) Snaga intuicije – inteligencija nesvjesnoga, Zagreb: Facta

[24] Fiske, S. T. & Taylor, S. E. (1984) Social cognition, Addison-Wesley Pub. Co., Reading, Mass.

[25] Kahneman, D. (2013) Misliti, brzo i sporo, Zagreb: Mozaik knjiga, pp. 27-38.

[26] Heuer, R. J. (1999) Psychology of Intelligence Analysis. Central Intelligence Agency: Center for the Study of Intelligence, p. 7.

Patterns of expectations subconsciously tell the analyst what to look for in the data, what is important and relevant, and how to process that information and fit it into the bigger picture. Analogously, the analyst will form his judgment and develop hypotheses based on his observations. The more confident he is in his initial perception, the more it will influence all subsequent observations. New evidence will be assimilated into the initial judgment until it becomes significantly contradictory and so obvious that it dominates the analyst's mind. The initial perception, although wrong, will resist change because the amount of information required to refute the hypotheses is significantly greater than that required to establish the initial hypotheses or conclusions. One way we can reduce the impact of perception on judgment is to delay final judgment until we have gathered and evaluated all the necessary information and evidence. An example of perceptual challenges that is worth mentioning in the context of information disorders is apophenia - the tendency to search for meaning and perceive meaningful patterns or connections in random, unrelated or meaningless data - with its manifestations in the form of gambling error, clustering illusion or pareidolia. The aforementioned patterns, heuristics and biases - on the one hand as a consequence of evolution, and on the other hand culture, education and environment - are an integral part of the mindset, which in turn determines the way we reason. The mindset is the prism through which we perceive the world, each of us in a unique way, and the help in solving the problem of the mindset lies in the development of critical thinking and the application of structured analytic techniques. When it comes to the role of memory in the context of information disorders, all three stages - encoding, storing and retrieving information - are important for identifying misinformation and fake news. It is also important to note that information is retained in sensory memory for a very short time (0.5 to 2 seconds). From sensory memory, part of the information goes into short-term memory, where it is retained for a few seconds or minutes. Information that is encoded in short-term memory passes into long-term memory, where it can be stored for a longer period of time, and the storage will be more successful if it is repeated, organized and if different mnemonics are used. Perception and attention are focused on emotionally relevant information, which may result in preferential encoding of emotional information. A further consequence may be that less attention is directed towards peripheral information, so that during encoding the key emotional aspects of a scene can be well remembered, while details from the surrounding context are ignored. The best example is the concept of “weapon focus”, which illustrates the situation when the presence of a weapon results in a good memory of the details of the weapon and other stimuli located in the immediate vicinity, while other details, such as the attacker's face, are poorly remembered.[27]

Storing information in memory does not end immediately after encoding. During the consolidation phase, memories are fragile and subject to disruption and modification. The memory of an event can be strengthened or weakened, depending on the valence of the emotion. Emotions affect the consolidation process: emotionally important events will benefit from stronger consolidation, which increases the possibility of later retrieval of information from memory. Emotions can increase the subjective experience of recollection (regardless of the accuracy of the memory), which can increase the confidence we have in the memories. The vividness of memories of emotionally important events is taken as an indicator of accuracy, and thus false memories are formed. Emotions and the ability to recall information are important components of the availability bias, which rests on the heuristic rule that “if you can remember something, it must be important”.

[27] Brosch, T., Scherer, K., Grandjean, D. & Sander, D. (2013) The impact of emotion on perception, attention, memory, and decision-making. Swiss Med Wkly [Internet]. 2013 May 5 [cited 2023 Dec. 9];143(1920):w13786. Available from: https://smw.ch/index.php/smw/article/view/1687

4. APPLICATION OF INTELLIGENCE ANALYSIS TOOLS TO HELP COMBAT DISINFORMATION AND FAKE NEWS

Awareness of intuitive ways of processing information is the first step in the fight against information disorders. In order to overcome cognitive limitations, the authors of the article propose a model with four steps:

1. Raise awareness of the negative impact of cognitive limitations and creative blocks on the ability to reason and the processes of generating ideas, solving problems and making decisions.
2. Identify one's own cognitive limitations that prevent rational, logical and unbiased judgment.
3. Use tools and methods that will help overcome the influence of blocks and limitations on objective, logical and informed reasoning.
4. Make good, reasonable and bulletproof decisions for which we will be accountable.

In the context of information disorders as a whole, and especially disinformation and fake news, this method primarily refers to raising awareness and identifying heuristics, biases, problems of perception, attention and memory in observing, selecting and processing information nowadays, to the greatest extent from digital sources, that is, the Internet. The tools that the authors propose in this article to help overcome cognitive limitations and combat information disorders are structured analytic techniques and tools of critical thinking in the data collection phase, specifically the application of the methodological framework for analysis and criticism by Richard Paul and Linda Elder, and the structured technique of detecting deceptions in the data analysis phase.

4.1. Strucutred Analytic Techniques

Given the limitations described in the previous chapter, the human mind is not capable of dealing with the complexity of the real world and therefore relies on building simplified mental models of reality that it then elaborates. Therefore, we can consider human rationality only within the framework of mental models that are not always adapted to the requirements of the real world. The inability to rationally and comprehensively consider alternative solutions is a frequent cause of poor and incomplete analysis and, consequently, bad decisions. One of the reasons is the mindset, and limited working memory is an additional challenge. Namely, it has been established that the human mind can simultaneously hold seven pieces of information in its working memory (plus or minus two)[28]. The fact that the human brain can hardly fully comprehend complex tasks greatly complicates analysis and decision-making. People make worse decisions in situations of increased level of cognitive load. When cognitive load exceeds cognitive capacity, individuals will make worse decisions, especially those that require significant effort (System 2). Cognitive Load Theory (CLT) is based on a generally accepted information processing model, which consists of 3 parts: sensory memory, working memory and long-term memory[29]. We are bombarded with a large amount of sensory information every day. Sensory memory filters out most of this information, but retains the impression of the most important items long enough for them to move into working memory. Information from sensory memory is transferred into working memory, where it is either processed or discarded.

[28] Miller, G. A. (1956) The Magical Number Seven - Plus or Minus Two: Some Limits on Our Capacity for Processing Information, The Psychological Review, Vol. 63 (2) : 81-97.

[29] Atkinson, R. C. & Shiffrin R. M. (1968) Human memory: a proposed system and its control processes, in Spence, K. W. & Spence, J. T. (eds.) The Psychology of Learning and Motivation, Vol. 2, New York, NY: Academic Press, pp. 89–195.

Miller's theory of limited working memory (7±2)[30] is the key to the theory of cognitive limitation. When the brain processes information, it categorizes it and transfers it to long-term memory, where it stores it in knowledge structures we call "schemas". Schemas organize information as we use it and are one solution to CLT. Also, to overcome this obstacle, the technique of problem externalization and decomposition is recommended, which allows us to "remove" the components of the problem from the working memory and transfer them to paper or the computer screen in a simplified form showing the basic components and their interconnection. This enables us to break down the problem, consider parts of the problem separately and their interrelationships, and visualize the analytical process. It is precisely on this principle that structured analytic techniques are based - they include decomposition of the problem and building simple models that show the relationships between the elements of the problem, as well as their relationship to the whole. Such simplified analytic models enable the assimilation of new information into long-term memory by defining categories (schemas) for information storage, and search and retrieval as needed. SATs compensate for the limitations of the human mind by analyzing complex problems with often vague or ambiguous information, a large number of actors, and changing circumstances. They do not provide a substitute for thinking, but serve as a tool to facilitate and strengthen thinking in complex situations. People are mostly unaware of the fact that they are victims of instinctive mental traits that prevent creativity, objectivity, rationality and precise analysis, and that they accidentally and persistently make a whole series of analytic errors. Given the aforementioned limitations to the complete rationality of decision-making and the impartiality of judgments and decisions, it is necessary to impose conscious thinking in order to minimize the influence of intuitive, often irrational mechanisms on our judgments, decisions and behavior. Therefore, it is necessary to use different structured analytical techniques in the analysis and all its accompanying processes and procedures. As a systematic approach to analysis and problem solving, SATs are indispensable tool in reducing the influence of heuristics and biases, thereby increasing the efficiency and effectiveness of judgments and decisions.

4.1.1. Deception Detection[31]

Deception is a kind of action by which the opponent (competitor) wants to influence the perception, decisions or actions of another for his own benefit. A deception detection technique[32] is a set of checklists that the analyst can use to determine when deception is to be expected, find out if it actually exists, or figure out what can be done to prevent or avoid that deception. If the deception is well executed, there will be no evidence for it, and therefore the precise determination of deception is extremely difficult. On the other hand, if the analyst expects deception, it is possible to find evidence even if deception does not actually exist. Therefore, awareness of instinctive mental traits and cognitive limitations as a prerequisite for successful application of this technique is crucial. The deception detection technique is used for advanced analysis of hypotheses for which no convincing evidence of the existence of deception was found in the testing phase. Such hypotheses are carried over to the second stage of the analysis where they are scrutinized and, if possible, rejected as incorrect or untrue. Sorting and analyzing evidence by type of source can provide key clues and clues about source reliability and possible deception. If all types of sources provide consistent evidence and support the hypotheses, then this is a good indicator.

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[30] Miller, G. A. (1956) The Magical Number Seven - Plus or Minus Two: Some Limits on Our Capacity for Processing Information, The Psychological Review, Vol. 63 (2): 81–97.

[31] Kopal, R. & Korkut, D. (2022) Obavještajna analitika – primjena u nacionalnoj i korporativnoj sigurnosti, Zagreb: Poslovno učilište, integralna sigurnost i razvoj, Hrvatska udruga menadžera sigurnosti, pp. 415-418.

[32] Heuer, R. J. & Pherson, R. H. (2010) Structured Analytic Techniques for Intelligence Analysis. Washington, DC: CQ Press College, pp. 173-176.

However, if this is not the case, it is necessary to determine whether some of the sources are subject to information manipulation with the aim of misleading and whether information from reliable sources matches other information from other sources whose reliability has not yet been established. Comparing information from open and covert sources can provide insight into source reliability and the possibility of fraud.
When it comes to information disorders, depending on their type analysts will apply one of 4 checklists known by the following acronyms:

- MOM,
- POP,
- MOSES, and
- EVE.

The following is a tabular representation of the checklists.

MOM (*Motives, Opportunities, Means*) – identifies motives, opportunities, and means
Motive: What are the goals and motives of potential deception?
Channels: What means does the potential "deceiver" have at his disposal, with which he will deliver information?
Risks: What consequences might the adversary suffer if the deception is discovered?
Costs: Will a potential "deceiver" have to sacrifice sensitive information to prove the channel's credibility?
Feedback: Is there some mechanism by which a potential "deceiver" can monitor the effect of the deception?

POP (*Past Opposition Practice*) – based on previous experiences, it determines the possibility of fraud
Is there a history of engaging in deception?
Do the current circumstances fit the patterns of previous deceptions?
If they don't fit, are there other historical precedents? If there are no precedents, are there any different circumstances that would explain the application of this form of deception in the current situation?

MOSES (*Manipulability of Sources*) – evaluates the manipulability of the source
Is the source subject to control or manipulation by a potential "deceiver"?
On what basis is the source considered reliable?
Does the source have direct or only indirect access to the information?
How reliable has the source been in the past?

EVE (*Evaluation of Evidence*) – evaluates evidence with respect to the source
How accurate is the source reporting? Has the entire chain of evidence been checked, including the translation?
Do the key pieces of evidence match? (sub-source can be more important than source)
Is evidence from one source (for example, internal sources) inconsistent with evidence from another source (for example, open sources)?
Do other sources provide supporting evidence?
Is any piece of evidence that the analyst might expect significant by not being present? (Alexander's question)

Table 1. MOM, POP, MOSES and EVE Checklists (Source: Kopal, R. & Korkut, D. (2022) Obavještajna analitika – primjena u nacionalnoj i korporativnoj sigurnosti, Zagreb:Poslovno učilište, integralna sigurnost i razvoj, Hrvatska udruga menadžera sigurnosti, p. 417.)

In addition to these checklists, there are additional rules[33] that can help identify information disorders:

- Avoid excessive reliance on a single source of information.
- Focus attention on the opinions of those who are closest to the information.
- Be skeptical of human sources or sub-sources of information that you have not personally met or for which there is no clear knowledge of how and from whom they obtained the information.
- Do not rely solely on verbal evidence; always seek material evidence (documents, photographs/images, addresses, or phone numbers that can be verified, as well as any other concrete and verifiable information).
- Look for patterns where, in several cases, information from the same source initially appeared accurate but later turned out to be incorrect, and the source offers seemingly convincing but ultimately poor explanations for such discrepancies.
- At the beginning of the project, generate and evaluate a range of likely hypotheses - including a hypothesis related to deception.
- Be aware of the limitations of recipients as well as the capabilities of creators and disseminators of information disorders.

4.2. Critical Thinking

„The greatest danger in times of turbulence, is not the turbulence, it's acting with yesterday's logic." Peter Drucker illustrates the importance of cognitive flexibility and adapting problem-solving tools to the specific problems we face. This certainly includes logical reasoning, which is a fundamental presumption of critical thinking. While thinking comes easily and spontaneously, maintaining a consistently high level and quality of thought across all aspects of life is more challenging. Higher-level thinking - critical thinking - entails evaluation, analysis, and creation, which John Dewey refers to as reflective thinking, defining it as the process of seeking and appropriately questioning the foundations or evidence for a particular belief[34]. Ordinary thinking - reproductive thinking - involves memorization, comprehension, and application, representing a process of accepting beliefs with little or no evidence.

This hierarchical division of cognitive domains[35] is a revised version of Bloom's taxonomy of educational objectives[36]. Cognitive domains are based on intellectual skills such as critical thinking, problem-solving, and the creation of a knowledge base. To develop as reflective thinkers, we must begin to consider that our thinking involves an implicit set of concepts that are important, and whose use can only be improved if we become aware of how we think, acknowledge the strengths and weaknesses of our thinking, and start utilizing the available tools that can help us enhance our thought processes.

[33] These rules are from Richards J. Heuer Jr. (1982) "Cognitive Factors in Deception and Counterdeception," in Daniel, D. C. & Herbig, K. L. (ed.) Strategic Military Deception, New York: Pergamon Press; and (1987). "Strategic and Operational Deception in Historical Perspective," in Handel, M. I. (ed.) Strategic and Operational Deception in the Second World War, London: Frank Cass.

[34] Dewey, J. (2013) How We Think. Seattle, WA: CreateSpace Independent Publishing Platform.

[35] Anderson, L. & Krathwohl, D. A. (2001) Taxonomy for learning, teaching and assessing: A revision of Bloom's Taxonomy of Educational Objectives. New York: Longman.

[36] Bloom, B. S., Engelhart, M. D., Furst, E. J., Hill, W. H. & Krathwohl, D. R. (1956) Taxonomy of educational objectives: The classification of educational goals. Handbook I: Cognitive domain. New York: David McKay Company.

4.2.1. Paul-Elder Method

Critical thinking is the skill of analyzing and evaluating thoughts with the intention of improving them[37]. To enhance the quality of thinking and develop intellectual virtues, Paul and Elder propose a methodological framework for effectively control thought structures and impose certain intellectual standards[38]. Thinking should be analyzed and evaluated according to standards of clarity, accuracy, relevance, precision, depth, breadth, significance, fairness, and logic.

INTELLECTUAL STANDARDS	
CLARITY	Can we elaborate further? Can we provide an example? Can we illustrate what we want to say? Can we express it in some other way?
ACCURACY	Is it really true? How can we find out if it is true? How can we verify that? How can we test that?
PRECISION	Can we be more specific? Can we provide more details? Can we be more precise?
RELEVANCE	How does it relate to the problem? How does it support the subject/issue? How does it help us with the issue?
DEPTH	What factors make the problem difficult? What complexities are involved in the problem? What are the difficulties we have to deal with?
BREADTH	Should we observe the problem from another perspective? Should we consider another point of view? Should we look at the issue in some other way?
LOGICALNESS	Does all of this make sense? Is the first paragraphed aligned with the last? Does this follow from the evidence?
SIGNIFICANCE	Is this the most important problem to consider? Is this the key idea to focus on? What facts are the most important?
FAIRNESS	Do I have any personal interest in this? Am I representing other viewpoints sympathetically?

Table 2. Intellectual standards (Source: Paul, R. & Elder, L. (2006) The Miniature Guide to The Foundation for Critical Thinking Critical Thinking Concepts and Tools, 4th edition, Foundation for Critical Thinking. p. 12.)

Paul and Elder suggest three levels of thinking, with the acquisition of critical thinking skills allowing us to progress from the lowest to the highest level. Higher-level thinking can sometimes be inconsistent in quality. To reach the third level, it is essential to develop intellectual virtues, not just intellectual skills.

[37] Paul, R. & Elder, L. (2013) Critical Thinking: Tools for Taking Charge of Your Professional and Personal Life (2nd Edition). London, UK: Pearson FT Press

[38] Ibid.

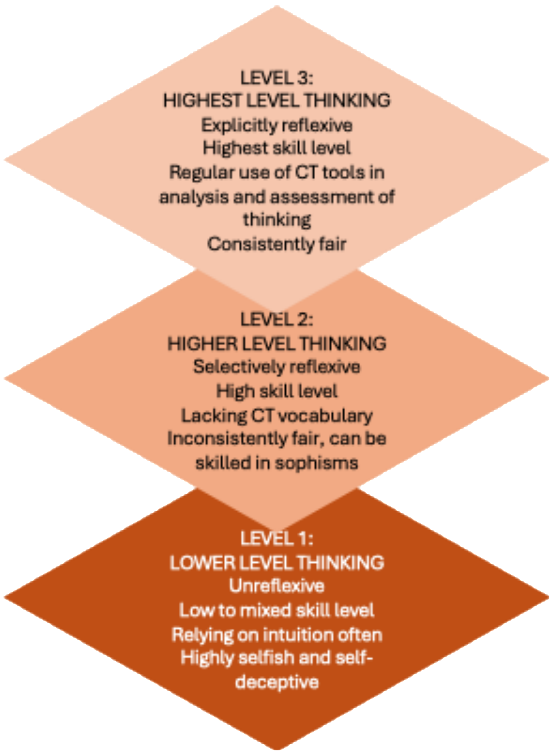

Figure 1. Three levels of thinking (Source: Paul, R. & Elder, L. (2013) Critical Thinking: Tools for Taking Charge of Your Professional and Personal Life (2nd Edition). London, UK: Pearson FT Press, p. 9.)

Today, we also understand that critical thinking inherently requires the acceptance that all reasoning occurs within specific perspectives and frameworks, that every line of reasoning is driven by certain purposes and goals, and that it relies on information. All data used in reasoning must be interpreted, and this interpretation involves specific concepts, which carry certain assumptions, and that all fundamental conclusions have implications. In analyzing the reliability of sources and the credibility or accuracy of the information itself to uncover information disorders, we utilize the analysis of these elements of thought. To this end, we will define eight elements of reasoning that help thinkers pose targeted questions about the topic being considered and about the thinking process itself[39]. Paul and Elder emphasize that learning to analyze thinking requires practice in identifying the structures we use.

Therefore, they suggest that, when thinking critically, we:

- Do it from a certain *point of view (*or *views).*
- Have some *purpose*…
- …trying to answer a *question* (or *questions*).
- Use assumptions regularly…
- …as well as *concepts* and theories…
- …combined with *information*, facts and experience…
- …to make *inference* and conclusions…
- …leading to *implications* nd consequences.

[39] Kopal, R. & Korkut, D. (2022) Obavještajna analitika – primjena u nacionalnoj i korporativnoj sigurnosti, Zagreb: Poslovno učilište, integralna sigurnost i razvoj, Hrvatska udruga menadžera sigurnosti, pp. 305-307.

Each of the elements will be further explained using questions based on the Socratic method of teaching. Every reasoning is conducted from a certain position, from a specific POINT OF VIEW. The following questions help us identify whose perspectives we are considering:

- What broader picture is the author considering?
- From what perspective does the author view the problem/question? Biography? Background?
- What other viewpoints might be relevant or reveal new insights?

The perspective is extremely important as it speaks to the authority of the person considering a particular issue or problem and their credibility. Is this person biased? Is what they are discussing even relevant? Do they have the necessary expertise to reason in this area?

The next element is PURPOSE or intention.

- What is the purpose of the article?
- What is the author's goal?
- Is the purpose clearly stated?
- Is the purpose justified?

Here, one can also question whether the author has any personal interest in what they are writing about. The purpose is usually expressed with active verbs like "to inform," "to provide insight," "to explain," etc., and is connected to possible implications.

Every reasoning attempts to solve a problem or answer a QUESTION:

- What are the key questions the author is trying to answer?
- Are the questions and purpose directly linked and mutually relevant?
- Is the question regarding the problem well-posed?

Every sentence in a text may respond to some question, but it is essential to identify which key questions prompted the author to engage with the topic or problem.

Every reasoning is based on ASSUMPTIONS:

- Assumptions are usually unspoken and subconscious.
- They are crucial for reasoning.
- Identify assumptions and determine whether they are justified (i.e., can they be substantiated).

Assumptions are extremely important as they form the foundation of every argument, yet they are not explicit and can leave us "in the dark." It is vital to remember that an assumption is something that is not visible or tangible; it precedes an argument because if an author does not assume something, they cannot draw conclusions.

Every reasoning is expressed and shaped by certain CONCEPTS:

- What concepts must the reader understand to derive meaning from the author's thinking?
- Does the author explain key concepts where necessary?

It is important to emphasize that concepts often consist of "foreign," "complicated" words whose understanding is crucial for grasping the text.

Depending on the topic, this may include terms like democracy, sociocentrism, critical thinking, market competition, geopolitical relations, etc. In Paul-Elder framework, concepts are key terms we must understand to comprehend the meaning of what has been written.

Every reasoning relies on INFORMATION and EVIDENCE:

- Does the author cite relevant evidence, experiences, and/or information crucial to the issue at hand?
- Are the information accurate? Can they be verified from other sources?

Evidence strengthens our confidence in conclusions, places our narrative in context, and provides a broader picture. Often, the ability to verify from another relevant source enhances both the credibility of the information and the reliability of its source.

Every reasoning contains CONCLUSIONS:

- How does the author use evidence to arrive at a conclusion?
- How sound is the reasoning process, and how strong is its logic?
- Identify conclusions from the text.

It is important that conclusions are based on solid arguments and that the reasoning process is valid. This means that depending on the type of argument, a conclusion must necessarily (deduction) or probably (induction, abduction) arise from its premises. If we identify logical fallacies, then conclusions are poor because their arguments fail to meet one or more criteria for good arguments.

Every reasoning leads to certain IMPLICATIONS:

- Try to track implications and consequences arising from the author's reasoning.
- Look for both negative and positive implications.
- Consider all possible consequences.

It is necessary to consider what possible consequences arise from what the author states in their text. Implications are related to purpose or intention. For example, if the purpose is to inform a segment of the population, decision-makers, or other users of our analytical products about an evolving situation, we might expect implications such as new insights, better awareness of issues, or perhaps decisions or behaviors that will follow.

Additionally, critical thinking nurtures and develops various intellectual values such as humility, autonomy, integrity, courage, perseverance, reasonableness, empathy, and fairness. This framework embodies Paul-Elder's method[40].

Figure following on the next page

[40] Kopal, R. & Korkut, D. (2022) Obavještajna analitika – primjena u nacionalnoj i korporativnoj sigurnosti, Zagreb: Poslovno učilište, integralna sigurnost i razvoj, Hrvatska udruga menadžera sigurnosti, p. 265.

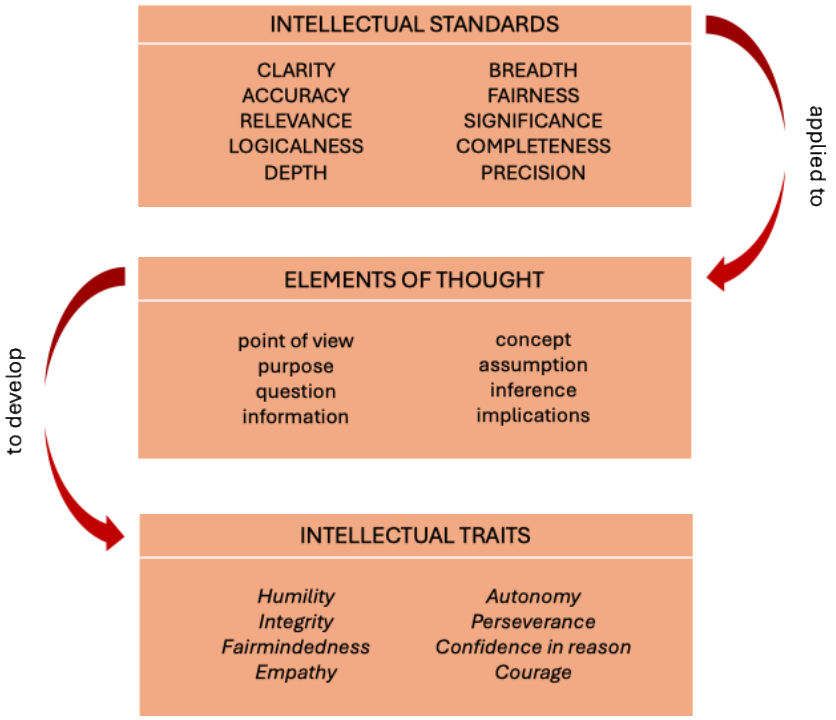

Figure 2. Thinking elements (Source: Paul, R. & Elder, L. (2013) Critical Thinking: Tools for Taking Charge of Your Professional and Personal Life (2nd Edition). London, UK: Pearson FT Press, p. 72; Kopal, R. & Korkut, D. (2022) Obavještajna analitika – primjena u nacionalnoj i korporativnoj sigurnosti, Zagreb: Poslovno učilište, integralna sigurnost i razvoj, Hrvatska udruga menadžera sigurnosti, p. 305)

Basic idea of Paul-Elder method is that critical thinkers have a habit of applying intellectual standards on elements of thought to develop intellectual virtues.

5. CONCLUSION

Technological advancement has accelerated the creation and facilitated the distribution of information that overloads our perception and sensory memory, creating an environment that is not aligned with our cognitive capacity. As a result, cognitive overload exceeds cognitive capacity, hindering learning and promoting poorer decision making. The effort we invest in processing content-irrelevant information increases, thereby raising the likelihood that important information will go "under the radar" or that less important, irrelevant, or inaccurate information will successfully bypass the filter of sensory memory. In addressing everyday challenges, analysts often encounter unclear, complex, and difficult situations that require calculating the probabilities of certain outcomes, developing scenarios and indicators, and preparing applicable recommendations for decision-makers based on quantitatively limited and qualitatively questionable data and information. At the same time, decision-makers are forced to make important choices based on large amounts of information, often subjective, incomplete, and outdated. It is the analyst's task to use various methods and tools to identify threats, design and evaluate possible plans and strategies, and provide decision-makers with timely, meaningful, and applicable recommendations for actions that will minimize potential harm and maximize benefits. The fundamental prerequisite for fulfilling this task is logical, rational, and objective reasoning.

Given the challenges of limited rationality - cognitive, informational, and temporal constraints as well as the inability to judge completely deprived of emotions - the skilled application of techniques and tools is immensely important in overcoming these challenges and producing good analyses based on accurate and reliable information.

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BEYOND DETERMINISM: THE RELATIONSHIP BETWEEN CSR AND CFP

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ABSTRACT

The measurement of financial performance and social performance is one of the main explanations for the ambiguity of the relationship between CSR and corporate social responsibility. The aim of this article is first to present the different methods for measuring financial performance, then to cite the methods for measuring ¨corporate social performance and finally to conclude with the advantages and disadvantages of the different measurement methods.

Keywords: *Performance, Corporate social performance, Corporate financial performance, CSR.*

1. INTRODUCTION

One of the main explanations for the ambiguity of the relationship between Social Performance and Financial Performance is the problem of measuring ESP. Previous studies have used a wide variety of methods to measure Social Performance and Financial Performance. There are two methods of measuring financial performance: accounting methods and market methods. Market-based measures do not represent the fundamental value of a company, but rather the perceptions of shareholders, while accounting-based measures represent short-term, company-specific profitability. Whereas for corporate social performance we use: self-constructed surveys (Aupperle, 1991), Fortune reputation survey (Brown and Perry, 1994), Dow Jones Sustainability Index (Lopez et al., 2007), CRO's Best Corporate Citizens (Wallace et al., 2009) and the KLD index developed by Kinder, Lydenberg, Domini and Co (Waddock and Graves, 1997; Hull and Rothensberg, 2008). PES is highly multidimensional, as it includes both internal factors (governance, employees, etc.) and external factors (impact on the environment and the community) that need to be taken into account when measuring PSC. The KLD index, which was replaced by the MSCI ESG (Environmental, Social, and Governance) index in 2011 following a change in data ownership from KLD to MSCI ESG. The aim of this article is firstly to present the different methods of

measuring financial performance, then to cite the methods of measuring corporate social performance, and finally to conclude with the advantages and disadvantages of the different measurement methods.

2. FINANCIAL PERFORMANCE

According to Bourguinion A (1995): "Performance is explained by the achievement and realisation of organisational objectives, whatever their nature and variety. This achievement may be realised in the strict sense (result, outcome) or in the broad sense of the process that leads to the result (action)"[1]. According to ERNST and YOUNG, performance is "the continuous achievement of the goals defined around the company's strategic plan. And to do this, the company must guarantee the context and the environment so that the people who make up the organisation can and want to achieve these objectives and thus create performance in the company explains everywhere what, and only what, contributes to improving the relationship between value and cost". According to Hansen and Mowen (2005), business performance is very important for management, because it is a result obtained by an individual or group of individuals within an organisation in relation to their authority and responsibility to achieve the objective legally, without going against the law, and in a moral and ethical manner. Performance is therefore the ability of an organisation to obtain and manage resources in different ways in order to develop a competitive advantage. Guerard (2006) has also defined it as the achievement of good profitability, satisfactory growth and the creation of shareholder value. Sogbossi Bocco (2010) has defined financial performance as the survival of the company or its ability to achieve its objectives. (IAI, 2016) defined it as the financial position of the company over a certain period, which includes the collection and use of funds, measured by several indicators such as the capital adequacy ratio, liquidity, leverage, solvency and profitability. Financial performance is a company's ability to manage and control its resources. "Financial performance is explained by a company's ability to create added value with the funds it receives from shareholders, banks and financial partners. This financial performance is measured by several methods using ratios and indices that can define the rates at which it is achieved. Profitability is the primary factor explaining the achievement of financial objectives, through the realisation of the desired turnover while controlling the costs and expenses borne by the company".[2]

Financial performance is a company's ability to manage and control its own resources. The financial dimension of performance has long been regarded as the benchmark for company performance and evaluation. Fundamental analysis is an analysis based on a company's financial statements, prospectus and other financial profiles. Technical analysis is an analysis based on statistical market data recorded by an organisation that describes the rise and fall of demand and supply. Learning finance means trying to understand financial management, financial information and financial decisions (Brealey & Myers, 1991).

2.1. Methods for measuring financial performance

Historically, corporate performance has been measured using earnings-based financial processes (Gunawan, 2007), with accounting and market methods dominating the financial performance literature. The literature presents financial performance from two perspectives: the accounting perspective and the market perspective. Both are well-accepted economic

[1] Annick Bourguignon ,Sous les pavés la plage... ou les multiples fonctions du vocabulaire comptable : l'exemple de la performance , in Comptabilité Contrôle Audit 1997/1, pages 90

[2] Cited by : Imatoukene Sarah Mekbel Tinhinane ,La performance financière cas de l'entreprise portuaire de Bejaia' EPB

approaches to measuring corporate performance. Researchers have determined that these measures are not statistically related and that they reflect two distinct dimensions of a company's financial performance (Gentry & Shen, 2010).
Market-based measures do not represent fundamental value of a company, but rather the perceptions of shareholders, while accounting returns represent short-term profitability, specific to the company (Inoue & Lee, 2011; Richard et al., 2009).

2.1.1. FP accounting measures

Accounting measurement methods receive the majority of researchers' attention, while financial market methods are less frequently encountered (Gbadamosi, 2016). to estimate the achievement of a company's financial objectives, the optimisation of the company's assets and the stability of the financial position (Boaventura et al., 2012; Orlitzky et al., 2003). The selection of the financial performance measurement approach and of the dependent variables representing financial performance needs to be done carefully taking into account the temporal characteristics and the subjective or objective nature of each respective measure (Richard et al., 2009).
The literature has revealed that researchers who use accounting metrics to measure financial performance use a variety of financial metrics and valuation ratios. One of the most important accounting ratios is return on investment (ROI), which is widely regarded as the true measure of a company's bottom line (Gentry & Shen, 2010; Gunawan, 2007). The most commonly used accounting ratios for assessing financial performance are ROA, ROE and ROS, as they are frequently used by regulators (Brooks, 2014). Boaventura et al (2012) reported that the most common measure of financial performance in the research literature is ROA, followed by ROE, sales growth, return on sales, market share, operating profits and earnings per share. Brooks noted that ROA indicates the extent to which a company uses its equity to generate revenue, while ROE provides a reliable indication of how a company invests its assets to generate revenue.

2.1.2. Measures of the FP market

Capital market-based measures, such as share prices and market-to-book ratios, are widely used indicators of the strength of a company's stock market (Gentry & Shen, 2010; Richard et al., 2009). The market-to-book ratio is described as the ratio between the total market value of a company and the total value of its assets. Researchers have debated the merits of this approach, with some arguing that capital market-based performance measures represent the fundamental value of a company that incorporates all relevant data and is therefore not limited to a single aspect of a company's performance, as is the case with accounting measures (Gentry & Shen, 2010; Richard et al., 2009). Other researchers have noted that market-based measures are more sensitive to system-wide perceptions and are representative of future and long-term performance than accounting approaches (Galant & Cadez, 2017; Gentry & Shen, 2010; Inoue & Lee, 2011; Richard et al., 2009; Tsoutsoura, 2004).

2.1.3. FP outlook measures

Perceptual measures have been used for many years as performance research tools. Reimann (1975) used a differential semantic questionnaire to assess public value scores for organisational performance. Ellinger, Yang and Howton (2002) used the Watkins and Marsick dimensions of the Learning Organisation Questionnaire, developed in 1997 and encompassing financial, economic and social aspects of the organisation, to assess managers' perceptions of organisational practices.
More recent examples of perceptual measures of financial performance include the work of Fonseca and Ferro (2016), Herrera Madueno, Larran, Martinez- and Martinez Conesa (2016),

Srichatsuwan (2014), Sweeney (2009) and Choongo (2017), in which researchers used Likert-scale questionnaires to investigate the relationship between CSR and financial performance. Perceptual measures offer the advantage of being a practical way of assessing financial performance when indicators in company news releases are inconsistent (Galant & Cadez, 2017). The recognised disadvantages of using perceptual measures exclusively are non-response bias and missing data or incomplete surveys, which need to be addressed (Ellinger et al., 2002).

2.1.4. Mixed FP measures

Several researchers have chosen to use a multiple measures approach to carry out correlative analyses of financial performance. The BSC is the most widely used multidimensional indicator of financial and operational performance, translating strategy into action (Gunawan, 2007; Richard et al., 2009). The overall measure includes both lagging and leading indicators of past and future performance. For SMEs, which generally do not have a market presence, the BSC may not be appropriate for studying financial performance. Tobin's Q ratio, the ratio of market value to total assets, and MVA, the ratio of market value to book value of equity and debt, are other measures of combined financial indicators. Garcia Castro, Ariño and Canela(2010) selected four measures to define financial performance, ROA, ROE, Tobin's Q ratio and MVA. Ellinger et al (2002), in their review of organisational learning and financial performance, selected the same four indicators in conjunction with a measure of value added to assess financial performance. Rodgers, Choy and Guiral (2013) chose a combined indicator, the Zmijewski score, to serve as an indicator of a company's financial health. The Zmijewski score is constructed from profitability, liquidity and leverage ratios, including ROA and Tobin's Q ratio. Galant and Cadez (2017) observed that the recent trend seems to be towards the use of multiple measures to define financial performance.

Table 1: Financial performance measurement indicators

Accounting	Market	Accountingand market
• ROA - return on assets Return on equities • ROE - return on equity • ROCE-Return on capital employed of capital employed • ROS - Return on sales • Net operating profit • Net income	• Returns (of shares) • Market value of a company • Employee Change in stock market returns	• Q Tobin's • VAM - value added to the market

Source: prepared by the author

2.2. The positive and negative aspects of indicators

On the positive side, accounting-based measures are available to all companies and are reasonably comparable. The main advantage of market-based measures is that they are contemporary. This means that they reflect changes in CSR more quickly than accounting-based measures. As far as limitations are concerned, accounting-based measures are historical. In addition, if total categories (e.g. net profit) do not take into account company size (Al-Tuwaijri et al., 2004), relativised accounting ratios such as return on assets (ROA) may be biased if the sample includes companies from different sectors (due to the age and asset

structure varying across industries). The main limitation of market-based measures is that they are only available for listed companies. In addition, market-based measures inevitably incorporate systematic (non-company-specific) characteristics of the market (e.g. recession), whereas accounting indicators are more sensitive to company-specific (non-systematic) perceptions of CSR (McGuire et al., 1988). It should be noted that some researchers have combined the two types of measures using indicators such as Tobin's Q (market value/total assets) or MVA (market value/book value of equity and debt) (Garcia-Castro, Ariño and Canela, 2010; Rodgers, Choy and Guiral, 2013). Others have also attempted to derive a comprehensive measure of financial performance by combining different existing measures to form an integrated index. Peng and Yang (2014) applied factor analysis to integrate various measures of financial performance (ROA, return on equity [ROE], earnings per share, cash flow to assets) into a single index. Similarly, a company's financial health was another measure used as an indicator of companies' accounting profitability (Rodgers et al., 2013). Recently there appears to have been a trend towards using more than one measure of CFP.

3. CORPORATE SOCIAL PERFORMANCE

There are five types of approach (Igalens and Gond, 2003). Four methods are based on the use of secondary data sources: content analysis of annual reports, the use of pollution indices, the use of reputation indices, and the use of data produced by specialised measurement bodies. A final method is based on the search for primary data, through the collection of perceptual measurements from questionnaire surveys[3].

3.1. Methods for assessing corporate social responsibility

Measuring CSR is complicated for two reasons. Firstly, as noted above, there is no consensus on the theoretical meaning of the concept of CSR (Dahlsrud, 2008). Secondly, the concept is multidimensional and comprises relatively heterogeneous dimensions (Carroll, 1979). Some researchers believe that CSR measurement methods should reflect stakeholder interests due to the theoretical basis of stakeholders and the multidimensional construct of CSR (Boaventura et al., 2012; Gunawan, 2007) other authors have suggested that the lack of agreement on the theoretical meaning of CSR concepts has led to diverse results in CSR performance. The disparity in results can be attributed to the range of CSR performance measures used by researchers (Galant & Cadez, 2017; Gbadamosi, 2016; Tsoutsoura, 2004).
Given the lack of consensus and the complexity of the concept, it is not surprising that many different approaches have been used in the literature to measure CSR. The different approaches can be summarised in the following groups, classified according to their frequency of use: (1) reputation indices; (2) content analyses; (3) questionnaire surveys; (4) unidimensional measures. The following sub-sections explore these measures in more detail and (5) Pollution Index.

3.1.1. Reputation assessment

Reputation indices are the most common method of measuring CSR performance (Galant & Cadez, 2017). These indices typically recognise the multidimensional nature of CSR. These reputation indices are compiled by specialised rating agencies. Kinder Lydenberg Domini (KLD) Reputation Index is the most widely used and is considered a leading index, developed to assess the multidimensional CSR attributes of S&P 500 companies that reflect the perceptions of stakeholders such as employees, the environment, communities and customers ,the MSC KLD 400 Social Index (Erhemjamts, Li, & Venkateswaran, 2013), the Fortune Magazine Reputation Index (Preston & O'Bannon, 1997), the Dow Jones Sustainability Index

[3] Quoted by Allouche and Laroche (2005)

(Škare & Golja, 2012) and the Vigeo Index (Girerd-Potin, Jimenez-Garcès, & Louvet, 2014). In addition to these major indices, there are numerous national indices such as the CFIE (Centre français d'information sur les entreprises) index for French companies (Ducassy, 2013), the Respect index for Polish companies (Lech, 2013) and the CSR index for Croatian companies. Reputation indices generally recognise the multi-dimensional nature of CSR. The dimensions of CSR assessed by the main indices identified above are presented in the table below.

Despite the different number of dimensions, the key themes are similar from one index to another (e.g. natural environment, employees, society, etc.) It is also worth noting that a comparison of the MSCI KLD and Fortune indices, carried out by Griffin and Mahon (1997), revealed that they were quite similar. The most commonly used index for measuring CSR is the MSCI KLD because of its comprehensive and important data on stakeholder management (Coombs & Gilley, 2005) and the availability of public data (Deckop, Merriman, & Gupta, 2006). It should be noted, however, that the exhaustiveness point of view is contested by other authors who claim that 'Fortune most admirable'is the most comprehensive and comparable (Johnson & Houston, 2000; McGuire, Sundgren, & Schneeweis, 1988) . The Vigeo index is mainly used to evaluate European countries (Girerd-Potin et al., 2014; Van de Velde, Vermeir, & Corten, 2005) where other indices are often not available. The Dow Jones Sustainability Index is the richest in terms of underlying dimensions (e.g. risk and crisis management) and geographical area covered. Artiach, Lee, Nelson and Walker (2010) also identified the Dow Jones Sustainability Index as best in class due to its coverage of all industry sectors. The above debate suggests that there is no consensus on which reputational index is the best measure of CSR.

Table 2: CSR dimensions included in the main reputation indices

Reputation indices	Dimensions of CSR
MSCI KLD 400 social index	1. Environment 2. Community and society 3. Employees and supply chain 4. Customers 5. Governance and ethics
Fortune magazine Most admirable	1. Innovation 2. Personnel management 3. Use of company assets 4. Social responsibility 5. Management quality 6. Financial strength 7. Long-term investment value 8. Product/service quality 9. Global competitiveness
Vigeo index	1. Human resources 2. Environment 3. Corporate governance 4. Community involvement 5. Corporate behaviour 6. Human rights
Dow Jones Sustainability Index	ECONOMIC DIMENSIONS 1. Corporate governance 2. Risk and crisis management

	3. Codes of conduct/compliance/anti-corruption and bribes 4. Sector-specific criteria ENVIRONMENTAL DIMENSIONS 1. Environmental reports 2. Industry-specific criteria SOCIAL ASPECTS 1. Developing human capital 2. Attracting and retaining talent 3. Work practice indicators 4. Corporate citizenship/philanthropy 5. Social relationships 6. Industry-specific criteria

Source: Fortune, The World's Most Admired Companies ;McGrawe Hill Financial, S&P Dow Jones Indices, 2015; MSCI ESG Indexes; Vigeo Eiris Rating

2-1-1 Content assessments

Many researchers have also used content analysis of corporate communications, which is the second most common method of measuring CSR, in their investigations of social performance (Galant & Cadez, 2017; Gbadamosi, 2016). Companies publish public reports that reflect their CSR philosophy and commitment to addressing social issues (Rieschick, 2017).

Content analysis involves the identification, collection and codification of CSR categories such as environment, community engagement, employee relations and equal opportunities (Gbadamosi, 2016). A first example of content analysis was carried out by Abbott and Monsen (1979) as part of a study of companies in the Fortune 500 ranking, with the aim of developing a scale for disclosing a company's social commitment.

Modern examples include the work of Rahmawati and Dianita (2011) and Uwuigbe and Egbile (2012) in their investigations of the links between CSR and finance. in their investigations of the relationship between CSR and financial performance in Indonesia and Nigeria respectively. Galant and Cadez (2017) argue that the content analysis process needs to be conducted with care, given the sensitivity of the process to both researcher interpretation and bias in company CSR reports. They further argue that the biases associated with CSR reports can be combated depending on the researcher's interpretation. could be faced, depending on the extent of the researcher's knowledge of the social activities of the companies concerned. The validity of the content analysis measurement method and its practicality remain in question (Gbadamosi, 2016).

3.1.2. Questionnaire survey

Questionnaire surveys are frequently used to investigate companies with limited reporting or that are not ranked by reputational indices (Galant & Cadez, 2017). Surveys are administered to primary or secondary stakeholders, including company executives, for the collection of primary CSR data. One of the first CSR assessment surveys was based on the four components of CSR developed by Carroll (1979). More recently, Rettab, Brik and Mellahi (2009), Srichatsuwan (2014) and Sweeney (2009) have administered CSR surveys to primary or secondary stakeholders, including business leaders, to collect primary CSR data

A questionnaire has been developed to investigate the relationship between CSR and financial performance, aimed at managers and stakeholders. In another recent study, Gallardo-Vázquez and Sanchez-Hernandez (2014) designed a scale to assess the social, economic and environmental dimensions of CSR and their relationship with corporate competitiveness. A key drawback of the questionnaire method of measurement is response bias. CSR researchers using questionnaire surveys to evaluate CSR activities have addressed response bias in different ways. In addition to using surveys, Sweeney (2009) and Fonseca and Ferro (2016) chose to use semi-structured interviews with CSR programme managers to obtain an independent assessment of the depth of understanding of CSR. Sweeney noted that interviews were more comprehensive than surveys and that the interview process was time-consuming and required several interviewees to travel long distances.

3.1.3. One-dimensional measurements

One-dimensional constructs focus on a single dimension of CSR, for example environmental management or philanthropy. Examples of environmental activities include data on investments in pollution control (Peng & Yang, 2014), the deployment of a carbon emissions reduction strategy (Liu, 2016), the use of eco-control (Henri & Journeault, 2010), the ratio of recycled toxic waste to total toxic waste. the ratio of recycled toxic waste to total toxic waste generated (Al-Tuwaijri, Christensen, & Hughes, 2004), adoption of global environmental standards (Dowell, Hart, & Yeung, 2000), environmental proactivity (Primc & Čater, 2015), implementation of environmental management accounting (Mokhtar, Jusoh, & Zulkifli, 2016). Examples of philanthropic activities include donations (Lin, Yang and Liou, 2009), growth in charitable contributions (Lev, Petrovits and Radhakrishnan, 2010) and public health policies (Naranjo-Gil, Sánchez-Expósito and Gómez-Ruiz, 2016). The main advantages of unidimensional indices are data availability (which minimises the data collection effort) and comparability between companies. However, the use of one-dimensional concepts is theoretically problematic, as the concept of CSR is clearly multi-dimensional (Carroll, 1979). For example, a particular company may be heavily immersed in one dimension (e.g. employees) while neglecting another (e.g. environmental issues). A multidimensional operationalisation will detect poor CSR, while a unidimensional operationalisation will detect high or low CSR, but both are incorrect.

3.1.3. Pollution index

"They are generally produced by public bodies that are independent of companies, which lends a certain objectivity to the assessment (Igalens and Gond, 2003). The Toxic Release Inventory (TRI) is considered to be one of the most widely used indicators for measuring the rate of release of toxic waste into the soil, air or water.[4] In addition, one of the first indices was designed by the Council of Economic Priorities (CEP) and was based on a study of 131 firms in the pulp and paper industry (Cochran & Wood, 1984, p43) in response to pressure from the financial markets (Spicer, 1978, p 100).[5]

3.2. Advantages and disadvantages of different measurement methods

Our literature review has identified a range of approaches to the concepts of CSR and FP and determined their advantages and disadvantages. The main advantages and disadvantages of each approach identified in this study are summarised in the table below:

[4] Quoted by US Environmental Protection Agency,1995,Jones,1990
[5] Quoted by Decock-Good,(2001)

Table 3: Advantages and disadvantages of different measurement methods.

Measurement approach	Benefits	Inconvenient
For RSE		
Indices	Availability and comparability of data, recognised multi-dimensionality	Non-scientific, limited coverage of companies (geography, size, sector)
Content analysis	Flexibility for researchers	Subjectivity of the researcher, non-disclosure of data, print management
Surveys by questionnaire	Flexibility for researchers	Subjectivity of the researcher, measurement error, non-response
One-dimensional easurements	Data availability and comparability	Theoretical disability
For PF	Data availability and comparability	Historical data
Accounting-based indicators	Contemporary data	Data available only for listed companies also includes of systematic factors
Market-based indicators		

Source: prepared by the author

As this last table shows, there is no perfect measure of either CSR or FP. Nevertheless, the question of measurement is more relevant for CSR, as financial reporting has a long history and is largely standardised, whereas CSR reporting is a more recent development where little standardisation has been achieved to date (Tschopp & Nastanski, 2014). Reputation indices have the advantage of being available and comparable from one company to another due to the standardised methods used to compile them. For these reasons, they are widely used in empirical studies investigating the nature of the CSR-FP relationship (Soana, 2011).
Nevertheless, indices are far from ideal measures of CSR. One particular drawback is that they are generally compiled by private companies that have their own objectives and do not necessarily use the rigorous methods that are usually expected of scientific research (Graaflandet al., 2004). Another major drawback is the limited coverage of companies assessed. The indices generally focus on large, well-known, listed companies. This results in a selection bias, as these companies are subject to greater social pressure to be socially responsible and are therefore likely to perform better in this respect than less visible companies (Henriques & Sadorsky, 1999). Questionnaire surveys offer the same advantages as content analyses. A researcher can select the CSR dimensions of interest, collect information on these dimensions and code it to generate quantitative scores for further quantitative analysis. This approach also makes it possible to approach companies that do not disclose their data publicly. However, this same approach suffers from the subjectivity of the researcher. If the questionnaire is not well designed, it is doomed to measurement error, which means that the questionnaire items are not valid and reliable measures of the latent concepts they are supposed to measure (Turker, 2009). This is particularly relevant in the case of collecting information on sensitive concepts where some responses are more socially acceptable than others (Epstein & Rejc-Buhovac, 2014).

Finally, there is the problem of response bias. Survey research regularly shows that companies that perform better in relation to the subject of the survey are more likely to respond than companies that perform less well (Cadez & Czerny, 2016).Finally, unidimensional measures are often used because they are readily available and comparable across companies (e.g. productivity measures). Finally, one-dimensional measures are often used because they are readily available and comparable from one company to another (e.g. CO2 emissions). The problem with unidimensional measures, however, is their theoretical invalidity, as the concept of CSR is clearly multidimensional (Carroll, 1979). In fact, one-dimensional operationalisation can easily lead to false conclusions). One potential solution to the problem of researcher subjectivity is to standardise CSR reporting. Ramanathan (1976) called f o r the implementation of corporate social accounting to provide systematic information on a company's social performance, but today we still lack generally accepted standards for CSR reporting. Nevertheless, several standardisation initiatives are underway at global level, such as the Global Reporting Initiative (GRI), AccountAbility's AA1000 principles, the United Nations Global Compact Communication on Progress (COP) and ISO 26000.

4. CONCLUSION

In this article, we have distinguished between the different methods of measuring financial performance and social performance. Possible explanations for the lack of consensus and difficulties in measuring CSR have been put forward in previous studies (Waddock and Graves 1997). One possibility is to attribute this inconsistency to the multidimensional concept of CSR and its interrelationship across many disciplines; diverse concepts and issues ranging from strategic perspectives to human resource management, culture and stakeholders/shareholders. Another group of researchers have suggested that these unidentified and omitted explanatory variables (McWilliams and Siegel 2000) make it difficult to understand the latent mechanisms. At the same time, several studies have tested the existence of a relationship between a company's CSR performance and FP. To understand this link, researchers are equipped with instruments for measuring social performance. The vision taken from the definitions of Social Performance used in the studies collected for the narrative reviews "Pava and Krausz (1996); Frooman(1997); Griffin and Mahon(1997); McWilliams and Siegel(1997); Balabanis, Phillips and Lyall(1998); Margolis and Walsh(2003) ". Like the concept of CSR, corporate financial performance also lacks an agreed definition, which often leads to confusion and inconsistencies in comparability and limits its conceptualisation in business and management research. Broadly characterised by different but key elements, including performance measurement, strategy execution, business objectives and progress evaluation.

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THE DETERMINANTS OF THE EXPANSION OF AFRICAN BANKS IN AFRICA (2002-2022)

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ABSTRACT

The last two decades have been marked by the emergence of banks of African origin and the withdrawal of historical French and British players, more particularly in retail banking. This movement intensified with the famous financial crisis of 2008 and the promising economic growth in Africa, which has averaged over 5% over the past 20 years. The Top 10 African banks have experienced a remarkable dynamic of change over the past 20 years. Among these African groups, there are groups of Moroccan origin, very present in West and Central Africa, with subsidiaries in 25 African countries (2021). South African groups dominate the banking landscape in East and Southern Africa. The objective of this paper is to analyze the determinants of the expansion of large African banks in Africa during the last two decades and to explain this logic of internationalization of African banks.

Two conclusions emerge from our research:

1. The interest of large African banks to develop their retail banking activity in Africa, which constitutes a promising segment because of the low rate of banking in Africa and the withdrawal of French groups from this activity.

2. The essential and strategic choice of the form of establishment by taking advantage of the old brands of the acquired subsidiaries and the simplicity of development of the branch network which is very underdeveloped in the countries of establishment.

Keywords: *African Regions, Banking, Expansion, Retail Banking*

1. INTRODUCTION

The role of banks in financing and developing Africa is paramount. A continent characterized by dynamic growth of around 5% on average over the last 15 years (World Bank). In an economy dominated by small and medium enterprises that form the basis of the economic fabric, what emerges much more the activity of retail banks. This has motivated the rise of pan-African banking groups. The term pan-African used in this text does not have the ideological meaning of "solidarity movement between African peoples" as defined in the dictionary La Rousse. It designates the banks of origin an African country and which have developed a presence in other African not for an ideological objective of African union but rather a logic of economic and financial affairs. They have developed with different but convergent strategies. This has fostered the convergence of banking practices, techniques and service offerings. With a population of around one billion people, the banking sector is doing better and better on the continent. The development of these pan-African groups has made it possible to dig new avenues for financial development in Africa; especially, in areas considered less developed. This allows a convergence of African banking landscapes, which are considered very divergent between them. This expansion contributes to the increase in the rate of banking services, the development of financial inclusion, the financing of small and medium enterprises and the offer of access to the first financial service for a large category of the population.

This study is structured as follows:

- Literature review on the determinants of banking abroad.
- The determinants of the banking establishment of Moroccan groups in Africa.
- The development of the activity of Moroccan banking groups in comparison with South African banks.

2. LITERATURE REVIEW ON THE DETERMINANTS OF BANKING EXPANSION ABROAD

The theoretical explanation of banking presence abroad has evolved over time. The study of the 70s and 80s (Aliber, 1984: Gray 1981, Grubel 1977) has highlighted several determinants: *Cost of production, Banking regulation, Support of companies in the country of origin.* Fielke (1977) and Goldberg (1981) argue that U.S. banks seek to support firms in their home countries in the global marketplace. For Goldberg and Saunder (1981), the development of trade creates financial and banking needs. The size of the sector is also a determining factor according to Grosse and Goldber (1991), confirmed by Marashdeh (1993). Geographical proximity (Vertinsky 1992) plays a decisive and favourable role in the choice of location. Access to new growth markets also helps explain the choice of foreign presence in order to boost profitability. The study of Gray and Gray (1981), Yannopoulos (1983) and Aliber 1984 emphasized the singularity of banking activity, in the sense of banking abroad. Unlike other manufacturing activities, banking is a service activity characterized by the presence of a very close and direct relationship between the bank and the user. The bank differs from other manufacturing companies because it cannot penetrate the foreign market through exports, license sales or direct investment. Banks are forced to adopt a location strategy through subsidiaries, branches or both.

The financial literature has studied the main reasons behind the cross-border expansion of banks abroad. Nekhili and Karyotis (2008) grouped these reasons into two categories:

- Internal determinants;
- External determinants.

2.1. Internal determinants

There are four main reasons for these factors:

- Making a profit;
- Customers;
- Access to capital;
- Managerial motivations

2.1.1. The realization of profit is the first motivation mentioned in the literature for banking expansion which aims at the search for performance and efficiency. Indeed, banks seek to diversify deposit bases and the exploitation of new resources (Deng and Elysiani 2008). Thus, it reduces the volatility of results (Bout and Schmeits 2000).

2.1.2. Customer support and the search for new customers may explain the international expansion of banks. According to Dietsch (1992), banking is characterized by a long-term relationship between customers and the bank, which justifies this support. Through this, the bank tested a new market in order to set up Casson subsidiaries (1990).

2.1.3. ***Access to capital and liquidity*** is a singularity for the bank unlike other industrial companies. For Zimmer and Cauley (1990), capital is a key position because the bank has a greater leverage effect than another firm. Moreover, banks are looking for a market that allows them to have more attractive profits through higher interest rates abroad.

2.1.4. ***Finally,*** *according to Amihud and Lev (1981), managerial motivations explain expansion by the manager's motivations and not only by the shareholders' decision.* Also, Berger and Ofek (1996), Demsetz and Strahan (1997), link the establishment abroad by the desire of the manager who seeks to protect his job, his power and diversify his own risk. In addition, market diversification can offer indirect benefits to the manager.

2.2. External determinants

There are four main reasons for these factors:

- Financial innovations;
- Regulation;
- Country risk;
- The similarity of cultures.

2.2.1. ***Financial innovations and technological progress*** are part of the general framework of economic and financial change, encouraging cross-border expansion. Banks view a country's banking development as new opportunities and a source of performance (Miller and Parkhe, 2002).

2.2.2. ***Regulation*** is a key determinant of overseas banking expansion. This is the case of the French banking deregulation in the 80s which created a movement of mergers and acquisitions; and the case of the USA, with the Gramm-Leach-Billey Act (1999) allowed banks to diversify their activities and stimulated an interesting movement of mergers and acquisitions of retail banks and investment banks.

2.2.3. ***Country risk*** is a discriminating factor for setting up abroad. Quelin and Coeurderoy (1997) explain that moving abroad is a function of economic, political and social risks. Greuning and Bratanovic (2004) find that the bank pays attention to the risk of failure of the financial and political system.

2.2.4. ***Culture and history*** are also encouraging (even discouraging) factors for banking establishment. If the country of origin shares the same language with the target country, this can motivate the establishment. The observation in the case of Africa is that several banking groups orient their establishments towards countries with which they share the same colonial history.

3. THE DETERMINANTS OF THE BANKING ESTABLISHMENT OF MOROCCAN GROUPS IN AFRICA

Before analyzing the internal factors (2) and the external invoices (3) an overview of the African banking sector (1) is necessary.

3.1. Overview of the African banking sector

According to the report "Making Cross-Border Banking Work for Africa" prepared by T. BECK, M. FUCKS, D. SINGER and M. WITTE in 2014:

- 104 banks operating in Africa with at least one branch or subsidiary outside their home country;
- 71 banks have only a limited footprint in one to four markets;
- 33 banks are present through their operations in their home countries in five or more African countries.

E. Gelbard, A. Gulde and R. MAINO (2014) found that in 2013 the ratios "Bank deposits to GDP" in middle-income countries (MICs) averaged about 43% in sub-Saharan Africa, compared to 121% outside Africa. While these ratios were 30% in low-income countries in sub-Saharan Africa and 34% in low-income countries (LICs) in the rest of the world. Similarly, the M2/GDP ratio stood at 47% and 32% respectively for MICs and LICs in sub-Saharan Africa compared to 128% and 43% in countries in the rest of the world. Thus, "M1/M2" remained virtually unchanged between 2000 and 2013, when it increased from 102% to 128% for MICs in the rest of the world. Moreover, the WAEMU banking sector included 29 banking groups with international or regional participation at the end of 2018 (EIB 2020). Banking activity is dominated by these entities, which represent 86.8% of bank assets and 83.4% of customer bank accounts. In terms of market share, the banking groups Ecobank and Bank Of Africa (BOA) held respectively 13% and 9.6% of the total assets.

The profitability of WAEMU banks remains solid. Return on equity remains high, at 13.9% at the end of 2018 compared to 12.5% in 2017. Net banking income in the region amounted to €3 billion, up 6%, and overall net income increased by 24%, reaching €697 million at the end of 2018. The impact of the development of pan-African banks on the banking coverage, both geographical and physical, of millions of customers was very remarkable. Only Nigerian banks were responsible for the 20%, 26% and 35% growth of bank branches in Ghana, Sierra Leone and The Gambia, respectively (Enoch et al, 2015). Thus, the top five pan-African banks in West Africa, in terms of assets and networks, were responsible for 4,534 bank branches, 18,234 ATMs and nearly 90,000 agents and points of sale. The Ecobank Group alone reaches more than 23 million customers in 33 countries, and the KCB Group (Oldest bank in East Africa) reaches 22.9 million customers in the seven countries where it operated in 2015.

3.2. Internal Determinants

Four internal determinants are analyzed:

- The realization of profit;
- The clientele;
- Access to capital;
- Managerial motivations.

3.2.1. Profit making

Among the reasons that pushed Moroccan banking groups towards West and Central Africa was the potential for development of the banking sector that these two areas carry.

- Low rate of access to banking services (5% to 10%);
- Low barriers to entry in terms of capital;
- Banking sector in West and Central Africa less developed (Total Balance Sheet / GDP <70%)

3.2.2. Customers: Moroccan companies in Africa

Morocco is the second largest African investor in Africa after South Africa. Moroccan banks support Moroccan companies present in Africa in insurance, telecommunications, mining, buildings, public works, fertilizers etc.

3.2.3. Access to Capital: Moroccan Banks and Africa's Bank Deposits

One of the important motivations for the establishment of Moroccan banking groups in the two zones, West and Central Africa, is access to capital. Groups collect deposits more than they offer credits. These resources are characterized, above all, by a majority of sight deposits, considered cheaper and less remunerated. Then, they convert them into loans to African states, or transfer them through their subsidiaries to their parent banks.

3.2.4. Managerial motivations

Africa has been an opening for leaders. At the beginning of the 21st century, the managers of Moroccan banks were only responsible for activity at the domestic level. Given this, the desire to manage a continental financial group has materialized in Africa. In less than two decades, the assets managed by the top three groups have quadrupled.

3.3. External determinants

Tree external determinants are analyzed:

- Regulation
- Country Risk
- Historical and economic ties

3.3.1. Regulation

Over the past two decades, regulation has played a key role in the establishment of Moroccan banks in Africa. Indeed, most African countries in the West and Central zones were still at the stage of the Basel I Capital Accord requirements, others those of Basel II; while in countries such as Kenya, Egypt, Morocco and South Africa, the implementation of the Basel III capital framework was underway or finalized. This made the regulatory requirements within the reach of Moroccan groups. In addition, the entry barriers relating to the minimum thresholds for share capital, the requirements in terms of good repute and experience of managers, the arrangements relating to corporate governance, accounting procedures, the business continuity plan, internal control and the fight against money laundering and terrorist financing, were easily met by Moroccan banking groups, who are already operating in a more demanding market.

3.3.2. Country Risk

The Moroccan central bank plays a relevant role in ensuring the smooth functioning of banking activity in Morocco, and has a favorable reputation in Africa. Compared to other African systems, and those neighboring besides that of South Africa, the Moroccan banking system lends itself to international standards, and has a demanding regulator in terms of compliance with operating rules. This helps Moroccan banks to develop in a relatively secure climate, and even in their orientation towards African markets, the Moroccan central bank has developed a regulatory framework accompanying any M&A operation, or new establishment in Africa. This system focuses on the country risk, and aims to prevent any negative impact from outside.

Indeed, the Moroccan central bank supports the activity of Moroccan groups in Africa, and imposes minimum requirements in relation to the country of establishment and the complexity of the activities of the subsidiaries. These requirements develop with the development of the activity. This role played by the central bank pushes Moroccan banks to be vigilant towards risk, and gives the Moroccan banking system more reliability and professionalism in its expansion in Africa.

3.3.3. Historical and economic ties

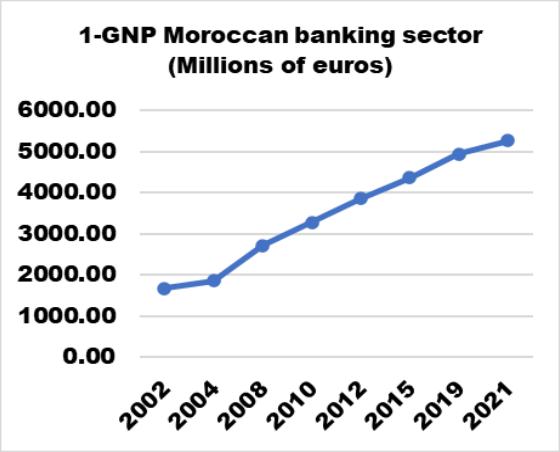
These countries share with Morocco the history, cultural, religious values and the various initiatives of openness to each other through religious activities and the facilities granted in terms of travel and tourism. Moroccan banks take advantage of trade and cultural values with these regions to open subsidiaries, branches or representative offices to support exchanges between countries, and to develop outside Moroccan territory. Senegal and Gabon are Morocco's main customers in French-speaking West and Central Africa. In these two countries, Morocco exports more products than it imports.

In Senegal, between1999-2014, trade flows increased significantly from $12.3 million to $156.2 million over the period, an average annual growth of 18.5% (Mubarak, p25). In West Africa, Senegal is the main partner in the Kingdom of Morocco. In Central Africa, Gabon is Morocco's leading partner. Trade flows between the two countries, over the period 1999-2014, increased from $19.6 million to $82.8 million, an average annual growth of 10.1%.

4. DEVELOPMENT OF MOROCCAN BANKS IN AFRICA AND CATCHING UP WITH SOUTH AFRICAN GROUPS

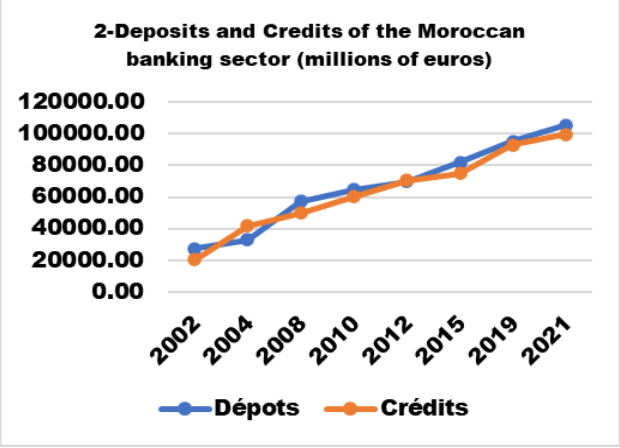
The structure of the Moroccan banking market is characterized by relatively high concentration. The top three banks account for a share that exceeds 66% of the national net banking income, two-thirds in terms of deposits and loans in the sector. Thus, AWB, BCP and BMCE have opened up to African countries, through their main subsidiaries which are respectively CBAO, Banque Atlantique and BOA. Indeed, these banks have the capacity, expertise and support of institutions such as Bank AL-Maghrib, to establish themselves in other African markets. The latter are carriers of growth and prospects for Moroccan groups.

Chart 1.



Source: Established by the authors from the annual reports

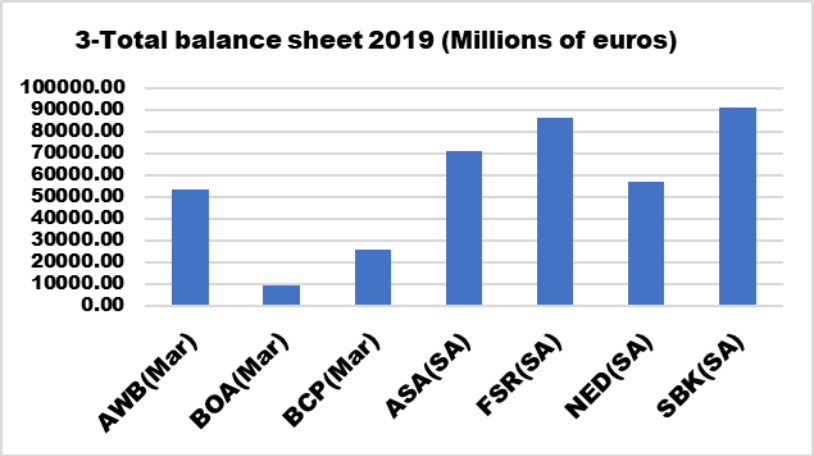
Chart 2.



Source: Established by the authors from the annual reports

With relatively similar strategies, Moroccan groups have oriented themselves towards the French-speaking area. AWB set up in Senegal in 2006 and expanded its presence with the acquisition of Crédit Agricole's African subsidiaries in 2009. This movement continued in the WAEMU zone based on its subsidiary CBAO. For BMCE, with the majority takeover of Bank Of Africa in 2010, which offered it its vector of expansion in sub-Saharan Africa. As for BCP, with the creation of an AFG joint holding company, it has been a vector of development in Africa.

Chart 3.



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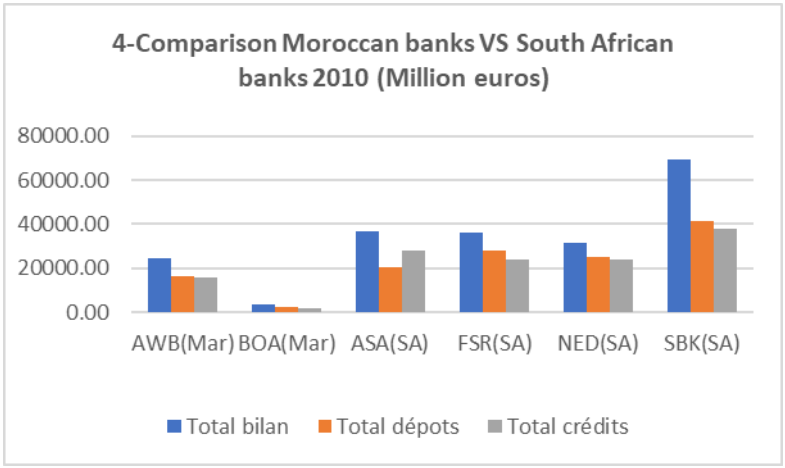
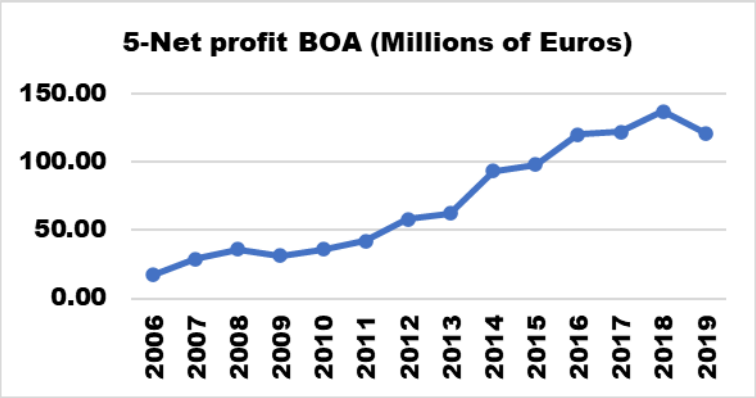


Source: Established by the authors from the annual reports

For their part, South African banks have a somewhat old presence in Eastern and Southern Africa, and also in West Africa such as Ghana in 1999 and Nigeria in 2007. Moreover, other South African banks such as First Rand have a more selective strategy that targets important English-speaking markets such as Ghana and Kenya with high potential. Moroccan groups have developed their presence outside the borders to the African continent to support Moroccan economic operators, take advantage of the profound transformations that African countries are experiencing and therefore improve their performance. They have different strategies but they converge gradually.

In other words, AWB began its expansion in November 2007, with the acquisition of 79.15% of the capital of CBAO. BCP in turn created the holding company ABI in 2012, via its capital partnership with the Ivorian Atlantique Financial Group, and in 2015, BCP's share was raised at 75% of the holding. BMCE Bank purchased 35% of BOA's shares, and BMCE Bank majority controls BOA's shareholding on 31 August 2010 . These last two banks are gradually imposing themselves in the share of the African vehicle unlike AWB which dominates the shareholder table since its intervention.

Chart 5.



Source: Established by the authors from the annual reports

Moroccan banking groups have developed by basing their establishments, above all, on the purchase of historical banking networks in Africa. The total assets of Moroccan banks represented 22% of the total assets of the banking sectors of the WAEMU zone in 2021. In addition, 3 banks with majority Moroccan capital are in the group of 5 banks that financed the WAEMU economy the most in 2019. The AWB group began its establishment in Africa in 2005, with the acquisition of a Tunisian subsidiary from a French group. In 2018, the group has its presence in 7 West African countries, 3 in Central Africa, Tunisia, Egypt and Mauritania. Its last subsidiary acquired was in Egypt, from an English group, this subsidiary contributed 6.5% in net income group share in 2017. The total contribution of its subsidiaries amounted in 2017 to 33%, and 40% in the contribution of the retail banking activity. BMCE carried out an acquisition of one of the oldest groups in Africa (BOA) in 2007. With the widest geographical coverage in Africa. Afterwards, the group proceeded to the final control of its acquisition in 2010. In 2012, BCP established itself directly in 7 countries of the WAEMU zone, through the creation of a joint holding company with ABI owned equally with an Ivorian group.

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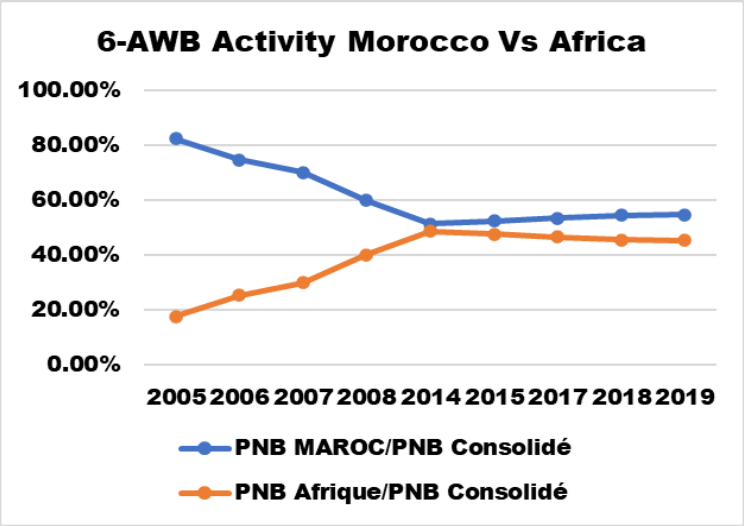
Chart 6.

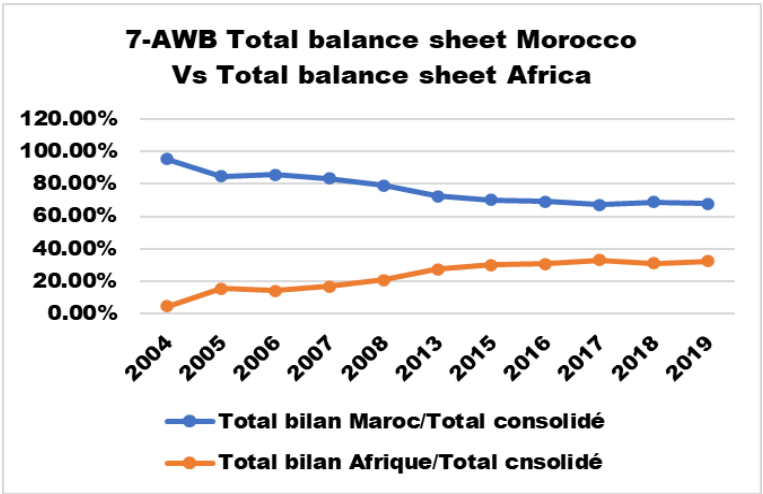


Source: Established by the authors from the annual reports

Moroccan groups have based their development strategies mainly on expanding their banking networks. To take advantage of the low rate of banking in Africa. Several AWB subsidiaries have the first network in their countries of operation (Senegal/Mali/Cameroon) or with solid positions in terms of banking network. For Moroccan subsidiaries, the retail banking activity generally exceeds 50% of their activities in the countries of establishment.

*"Moroccan banks began their internationalization first in Europe (establishment of BCP), with the aim of capturing money transfer flows from individuals (more than 25% of deposits in the Moroccan banking system depend on residents abroad). Moroccan banks benefit from another advantage insofar as they can rely on the triangle Europe/Sub-Saharan Africa / Maghreb, as much for the remittances of migrants' financial flows as for transactional banking and trade finance activities".(*SAIDANE. & LE NOIRE, P 100)

Chart 7.

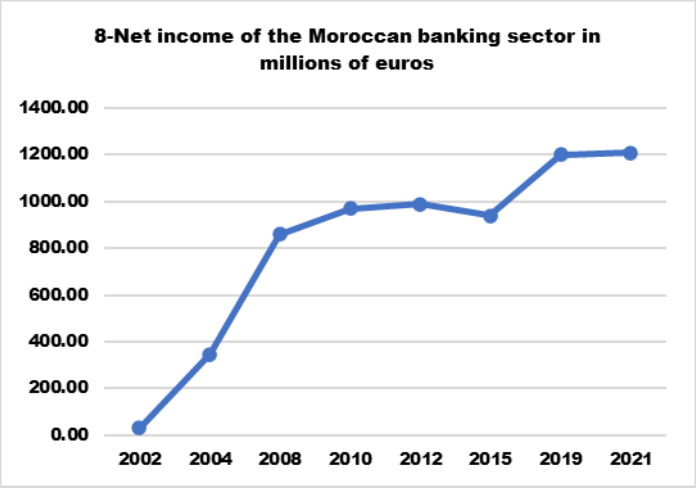


Source: Established by the authors from the annual reports

Moroccan banking subsidiaries in French-speaking Africa focus more on SME lending (Born and Mathieu, 2015; Beck et al., 2014). AWB, First financial group in North Africa in terms of assets and deposits, aims to reach populations that do not have access to banking services, through the expansion of its banking network, as well as to finance SMEs and large infrastructure projects on the continent (Christensen, 2014). According to A. Imbert, in the field of bank establishment, pragmatism and selectivity are required. Rather, resources must be devoted to consolidating positions in target markets rather than risking dispersal by being medium or weak everywhere. It notes that South African banks with good profitability have, moreover, a solid domestic base that represents both the bulk of their net banking income (NBI). By profiting through concentration in a limited number of key markets, where they hope to generate substantial revenues. The three Moroccan banking groups benefit from several elements of competitiveness, which have allowed them to establish themselves in West and Central Africa as key players in the banking sector. Over the past decade, they have taken advantage of stability in Morocco, to outpace other Maghreb groups in neighboring countries. Also, the elements of the regulations and the quality of human resources have favored the activity of Moroccan groups.

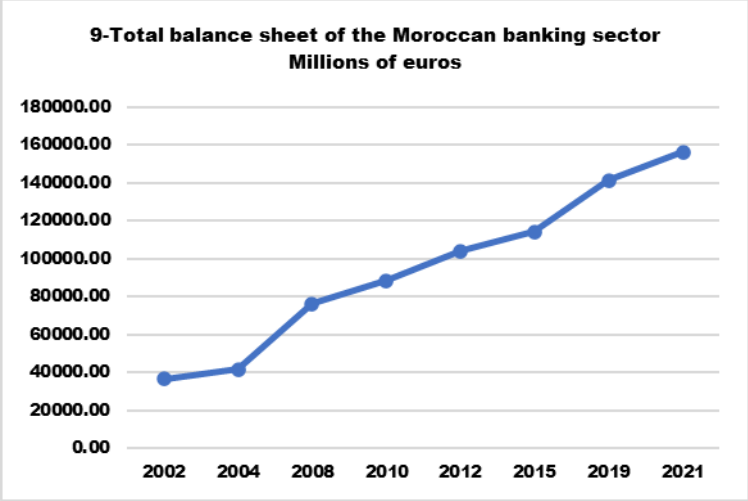
"The North African region, concentrates about 44% of the 1280 billion dollars of banking assets in Africa, the Maghreb is less favored in recent years: the banks that are located there are victims of the vast political recompositing underway (Egypt and Tunisia), of a mismanagement that persists (Algeria) or a slowdown in their national growth prospects. As far as Morocco is concerned, it is towards the South that development opportunities are identified. The Moroccan banking groups AWB and BMCE (via BOA) have seen their emulation strengthened with the entry into the game, since 2012, of BCP, now present in nine sub-Saharan countries. Indeed, Moroccan players surpass local or Western leaders in terms of market share in some countries of the WAEMU zone, and go so far as to coexist with three on the Ivorian market".(Mubarak, p25)

Chart 9.



Source: Established by the authors from the annual reports of the banks

Chart 10.



Source: Established by the authors from the annual reports of the banks

Table 1. - 10-Comparative table of Moroccan (MOR) vs South African (SA) banking sector

	2004		2019		2004	2019
	Top 3 MOR banking groups (A)	Top 3 SA banking groups (B)	3 MOR banking groups (C)	Top 3 SA banking groups (D)	$\frac{A}{B}$	$\frac{C}{D}$
Total balance sheet	25 086	78 534	87 621	248 758	32%	35%
Total deposits	15 478	51 745	95 500	191 500	30%	50%
Total appropriations	8 293	50 960	93 100	176 437	16%	53%
Domestic GNP	693	9 314	4 950	34 470	7%	14%
Net income	177	1 955	1 200	7 583	9%	16%
Number of countries of presence in Africa	2	9	25	18	22%	139%

Source: Established by the authors from the annual reports of the banks and Bank AL-Maghrib

Thus, in 15 years (from 2004 to 2019), the first five indicators used for the comparison between the top 3 Moroccan banks and the top 3 South African banks show that the percentages have almost all doubled and the sixth has been multiplied by 6. This shows that Moroccan banks have been more dynamic, in terms of internationalization, in Africa than South African ones.

5. CONCLUSION

With low banking rates, high rates of economic growth and banking activities, Moroccan groups have been able to establish themselves in the banking sectors of both WAEMU and CMCCA zones as leading players in just one decade (2004-2014). This shows that Moroccan banks have been more dynamic, in terms of internationalization, in Africa than South African ones. Moreover, the high-order presence of South African banking groups in Southern Africa represents a kind of complementarity of banking activity on the continent, between groups of Moroccan and South African origin. It is not yet supposed to exist competition or competitiveness between the groups of the two countries.

One of the challenges of the African banking landscape is the lack of papers, documents and studies that analyze the evolution of this industry. The banking sector represents an essential pillar for the financial and economic development of the continent, hence the need to multiply research efforts in this direction.

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PWC, South Africa-Major Banks Analysis, Nov 2019
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- List of acronyms

- ABI : Atlantic Financial International
- AFG Atlantic Financial Group
- AWB : AttijariWafa Bank
- BCP : Banque Centrale Populaire
- BMCE : Banque Marocaine du Commerce Extérieur. BMCE which has become BOA (Bank OF Africa)
- CBAO : Compagnie Bancaire de l'Afrique Occidentale
- CMCCA: Economic and Monetary Community of Central Africa
- WAEMU: West African Economic and Monetary Union

CAMPING TOURISM PERSPECTIVES: EMERGING TRENDS, CHALLENGES, AND OPPORTUNITIES FOR CROATIA

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Abstract

This paper explores the current landscape of camping tourism in Croatia, highlighting how global trends are transforming the industry and creating new growth opportunities. It identifies four major trends reshaping camping tourism: the increasing demand for authentic experiences, growing environmental awareness, a heightened focus on mental health and well-being, and the rise of collaborative and participatory culture. As camping evolves to offer more personalized and nature-oriented experiences, it faces both challenges and opportunities. Modern travelers seek experiences that align with their values of sustainability and wellness. The paper assesses Croatia's camping tourism development and regulatory framework, offering insights for stakeholders to navigate these trends and promote sustainable industry growth.

Keywords: *camping tourism, campsite, Croatia.*

1. INTRODUCTION

Camping, as an integral part of the broader tourism industry, is experiencing a remarkable increase in global popularity. From romantic retreats in nature to family adventures and exhilarating outdoor challenges, camping has evolved far beyond a simple vacation. It now represents a lifestyle that appeals to a diverse range of individuals across all ages and interests. Croatia, with its rich natural resources, diverse landscapes, and growing reputation as a destination for nature-based tourism, is well-positioned to capitalize on these changes. However, to fully harness the potential of this sector, it is essential to understand the major trends influencing camping tourism on a global scale. At the same time, academic interest in camping tourism is also on the rise (Milohnić & Bonifačić, 2014; Lee 2020; Maa et. al 2021). Recently, Rogerson & Rogerson (2020) conducted a comprehensive review and organization of the current body of international research on camping tourism. Their analysis highlighted several key themes in recent studies, including demand-side considerations, supply-side research, distinctive scholarship on holiday camps and budget tourism, as well as new innovations and management challenges arising from the evolving nature of camping tourism around the world. This paper contributes to the existing research streams by focusing specifically on the context of Croatia within the broader framework of camping tourism. In this paper, we explore four key trends that are shaping the camping industry worldwide: (1) the increasing preference for authenticity, (2) rising environmental consciousness, (3) a growing focus on mental health and well-being, and (4) the rise of collaborative and participatory culture. Each of these trends presents both opportunities and challenges for Croatia's camping tourism sector, which must adapt to meet the expectations of modern travelers.

By examining these trends, we aim to provide insight into how Croatia can strengthen its position as a camping destination and better align its offerings with the evolving needs of the global tourism market. Understanding these influences will be crucial for the country's tourism stakeholders as they seek to attract more visitors, enhance the camping experience, and promote long-term sustainability in this expanding sector. Today, the relationship between camping sites and their surrounding destinations is vital. Tourists often choose their destination first, and then select a campsite, with considerations such as environmental values and the overall experience of the destination playing a crucial role in their decision-making proces.

2. DEVELOPMENT OF THE CAMPING TOURISM IN CROATIA

The roots of camping can be traced back to the broader phenomenon of leisure and the use of free time. This early form of leisure travel evolved into what became known as the "Grand Tour," a journey primarily undertaken by young European aristocrats as part of their education. By the early 20th century, the Englishman Baden Powell, founder of the scouting movement, played a pivotal role in popularizing camping. Young people, particularly students, began embarking on extended travels, camping in tents, and experiencing the freedom and camaraderie of outdoor living (Sladoljev, 1998:13). The formal beginnings of camping in Europe can be linked to a significant event in Great Britain in 1886, when G. Stables constructed the first recreational trailer, designed specifically for tourism and pulled by a horse-drawn carriage (Cvelić Bonifačić, 2011:9). The first known European campsite was established in France in 1913. Building on these early developments, European campers, led by the British, founded the International Federation of Camping and Caravanning (IFCC) in the Netherlands in 1932, marking the start of organized camping on a larger scale (Cvelić Bonifačić, 2011:9). The initial phase of camping, particularly in Europe, was primarily an activity for the elite, driven by a desire to explore new regions and immerse in nature (Cvelić Bonifačić, 2011:9). The growth of camping tourism was significantly influenced by advancements in technology and shifts in social structures. The development of bicycles in the early 20th century, followed by the rise of automobiles and motorcycles, greatly expanded the accessibility of camping. These innovations, coupled with the production of specialized recreational vehicles and camping equipment, made camping more convenient and appealing to a broader audience (Čorak, 2006:69). Today, camping tourism has evolved into two distinct forms. The traditional form, often called Robinson camping, was popular from the 1950s to the 1990s and involved a more adventurous, minimalist approach. Since then, modern camping has shifted towards "glamping," a luxurious, high-tech form of camping that offers greater comfort and amenities (Čorak, 2006:69). The mid-20th century witnessed the rise of mass tourism, with camping becoming a popular form of vacationing. Despite technological advancements and changes in social preferences, the core motivation for camping, connecting with nature, has remained constant. From its inception, camping has been closely associated with nature, and today it represents a form of sustainable tourism. With growing environmental awareness, there is an increasing demand for eco-friendly campsites. Modern campers, influenced by changes in social structure and a lifestyle choice, increasingly seek high-quality and comfortable camping experiences. The equipment used in camping now demands better accommodation comfort, higher service levels, and advanced technical facilities (Čorak, 2006:69).

The history of camping in Croatia, particularly during the time of Yugoslavia, is less documented compared to other European countries. Early signs of camping activities in Croatia appeared in the mid-19th century, but it wasn't until much later that camping tourism began to develop more fully. The development of camping tourism in Croatia was closely linked to the growth of naturist resorts, reflecting the broader trends in mass tourism and private accommodation that dominated the tourism industry in the region (Cvelić-Bonifačić, 2012:9). Considering the specific historical development of Croatian camping tourism and various theoretical perspectives, its growth can be divided into several distinct phases (Cvelić-Bonifačić, 2012:29). The first phase, spanning from the end of World War II to the late 1970s, marks the beginnings of camping. The second phase saw intensive growth from the mid-1960s to the late 1970s. The third phase, during the 1980s, represents the peak period of camping tourism. However, the fourth phase, from 1991 to 2000, was characterized by decline and recovery due to the Croatian War of Independence, privatization, and gradual development. Finally, the fifth phase, starting in the new millennium, focuses on quality improvement and repositioning within the market. Although Croatia is renowned as a popular camping destination, there is a noticeable lack of regular and readily available national research on camper profiles and their satisfaction with services, unlike general tourism studies. Consequently, obtaining an accurate visitor profile using secondary data is challenging, as it is often outdated. However, valuable insights can still be gleaned from general tourism data. According to the TOMAS study from 2014, the average age of campers in Croatia is 43, with a monthly income ranging between 2,000 and 3,000 euros. Primary motivations for camping include passive relaxation, leisure, and entertainment, while experiences, gastronomy, and natural beauty rank second. Sport, recreation, cultural events, and wellness are less significant motivators. Many campers rely on destination and accommodation websites for information and share vacation photos on social media. Data from the Croatian Bureau of Statistics indicates that campers prefer independent travel over organized packages, reflecting the unique nature of camping tourism. Overall, the characteristics of campers do not significantly differ from those of the average tourist in Croatia. From 2014 to 2017, there has been a trend of increasing numbers of visitors with higher education and greater income, suggesting similar trends may be present among campers. Several empirical studies have offered valuable insights into camping tourism in Croatia. In their study, Cegur Radović et al. (2021) examine the relationship between camping tourism experiences in Croatia and tourist satisfaction and loyalty. Their findings reveal that three dimensions of the camping experience (education, escapism, and aesthetic) are positively correlated with both tourist satisfaction and loyalty. Next, Grzinic et al. (2010) highlight several key strategies for enhancing camping tourism in Central Dalmatia. They emphasize the importance of diversifying the tourist product, improving the quality of camping facilities, penetrating existing and new tourist markets, establishing a strong regional image, and rebuilding trust in traditional markets while stimulating interest in new ones. Furthermore, Gračan et al. (2010) argue that a rich camping offer has the potential to extend the tourist season in Croatia. They suggest that enhancing the business activities of camps by aligning with European standards and catering to specific tourist profiles such as families, enthusiasts, and bikers can help position Croatia as a desirable year-round destination.

3. REGULATORY AND INSTITUTIONAL FRAMEWORK FOR CAMPING IN CROATIA

In Croatia, several laws and regulations govern camping. The Hospitality Services Act defines camping as accommodation in tents, camper trailers, mobile homes, and other open spaces suitable for lodging. It also sets minimum requirements for the types and classifications of campsites. According to the Regulation on Classification, Minimum Requirements, and Categorization of Campsites, campsites are defined as "business-functional units" consisting of three main types of spaces and structures used in hospitality. The first type is open space designated for outdoor accommodation, which includes areas for camping, such as plots or pitches where guests can set up tents or camper vans. The second type includes various buildings designed for guest lodging, such as cabins, bungalows, or mobile homes. The third type encompasses other structures within the campsite that serve different purposes, such as facilities for guest services and activities. In Croatia, camping is legally permitted only in designated hospitality facilities. Camping outside these areas is punishable by law, whereas in other European countries, overnight parking in regular parking areas is allowed. Additionally, Croatian legal regulations classify campsites into several categories: first, there are camps within the "Camps and Other Types of Hospitality Accommodation" group; second, family-owned campsites; third, campsites located on agricultural estates; and fourth, temporary or occasional campsites. Alos, in Croatia, campsites are officially classified according to the types of services they provide. These classifications include: 1) camps, 2) camp settlements, 3) campsites, and 4) camping rest areas.

The regulations governing the classification and ranking of campsites require that these facilities ensure safety, functionality, and comfort in line with their classification level. Additionally, the exterior appearance and environment of the site must be well-maintained, and all equipment within the facility must be preserved and in good condition. According to Article 11 of the Regulation on Classification, Minimum Requirements, and Categorization of Campsites, all types of campsites must be organized and equipped properly, with staff trained to ensure the safe and smooth movement of both guests and employees. It is also essential to facilitate the easy transfer of belongings, ensure proper storage, and protect the health of guests and staff by providing professional services. For a campsite to be considered valid, it must meet several basic requirements. First, it must have a reception area, which can be located within the campsite or at its entrance. However, exceptions exist for campsites within tourist resorts or near tourist apartments or marinas, where the reception may be shared with these facilities. Second, the campsite must have at least 10 accommodation units, which can include various types such as camper pitches where guests can set up tents or camper homes. Additionally, the campsite must provide communal sanitary facilities for guests, including toilets, showers, and other essential sanitary elements. In addition to communal sanitary facilities, a campsite must also provide additional hygiene elements accessible to guests. These may include smaller toilets and showers located closer to the accommodation units. According to Article 17, campsites are required to ensure a continuous supply of safe and health-compliant drinking water. If possible, this water should be sourced from a nearby public water supply. If a public water supply is unavailable, the water must meet health standards through alternative methods.

Furthermore, the regulation mandates proper handling of wastewater. Ideally, wastewater should be connected to a nearby public sewer system. If such a system is not available, there are specified methods for treating or disposing of wastewater to protect the environment and safeguard guest health. In Croatia, the relevant ministry sets all requirements for categorizing campsites, including specific standards and quality labels. Campsites are rated with stars, ranging from a minimum of two to a maximum of five, with each campsite receiving only one category. Camps must meet a designated score threshold based on criteria such as ecology, sports and recreation, and commercial and hospitality facilities. In Croatia, campsites cannot be rated with one star, and the star rating aligns with European standards. The category and type of the campsite are clearly displayed on a sign at the main entrance, along with the name of the managing company and the campsite itself. The categorization and classification process follows the General Administrative Procedure Act, which includes reviewing submitted applications, verifying documentation, and conducting inspections to ensure compliance with requirements and actual conditions. This process helps guests easily identify and select campsites that meet their needs and expectations, while also enhancing the quality and transparency of Croatia's camping options.

4. CHALLENGES AND OPPORTUNITIES OF THE CAMPING INDUSTRY IN CROATIA

Camping as a tourist activity has significantly evolved from its traditional view, offering a unique experience compared to other forms of tourism. Its distinctive appeal lies in its ability to let tourists actively engage with and personalize their experiences. The tourism industry faces growing challenges, with global trends and changing consumer demands affecting camping tourism in particular. Key global trends influencing the camping sector include: (1) a growing preference for authenticity, (2) heightened environmental consciousness, (3) an increased focus on mental health and well-being, and (4) a rise in collaborative and participatory culture.

As modern travelers increasingly seek meaningful, immersive experiences that connect them to nature and local cultures, camping has emerged as a popular choice. However, this shift toward authenticity brings both challenges and opportunities for camping tourism providers. On the one hand, travelers are no longer content with superficial or standardized experiences; they seek genuine encounters with nature, local communities, and sustainable practices. Camping, with its inherent connection to the environment and minimal impact ethos, is well-positioned to meet this demand. By promoting eco-friendly practices, local traditions, and unique natural settings, campgrounds can cater to this growing demographic of conscious travelers. However, the challenge lies in balancing authenticity with accessibility and comfort. While some travelers may embrace the rugged, "back-to-basics" aspects of camping, others still expect a certain level of comfort and convenience. As a result, camping providers face the dilemma of delivering authentic, nature-based experiences without diluting the very essence of camping. Next, as global awareness of environmental issues continues to grow, so too does the expectation for tourism industries to adopt sustainable practices. Camping tourism, inherently rooted in nature, is uniquely positioned to respond to this shift toward environmental consciousness. The opportunity lies in camping's natural alignment with environmental values.

As travelers become more aware of their ecological footprint, they seek experiences that allow them to engage with nature while minimizing their impact on the environment. Camping, traditionally viewed as a low-impact form of tourism, offers a pathway for eco-conscious travelers to connect with nature in a responsible manner. This is especially true for campsites that prioritize sustainability by using renewable energy, minimizing waste, conserving water, and protecting local ecosystems. However, catering to environmental consciousness presents distinct challenges. The primary challenge lies in balancing the implementation of sustainable practices with economic viability. While travelers increasingly value eco-friendly experiences, the costs of transitioning to sustainable infrastructure can be prohibitive for many smaller campsites. Installing renewable energy systems, improving waste management, and adopting conservation practices often require significant upfront investment. For many operators, the difficulty lies in maintaining affordability for travelers while covering the costs of sustainable development. Another challenge is managing visitor impact. As more people are drawn to camping as a way to reconnect with nature, increased foot traffic can strain natural environments, leading to erosion, habitat disruption, and waste management issues. The opportunity for camping tourism lies in its natural alignment with well-being trends. Numerous studies have shown that spending time in nature can reduce stress, improve mood, and enhance overall mental health. Camping offers travelers a chance to disconnect from the pressures of modern life, engage in mindful activities like hiking, meditation, or stargazing, and enjoy the therapeutic benefits of being immersed in natural surroundings. Campsites that emphasize tranquility, mindfulness, and relaxation are well-positioned to attract travelers looking for a restorative escape. Additionally, the well-being trend offers opportunities for camping providers to diversify their offerings. Wellness retreats, eco-therapy programs, and "digital detox" experiences are becoming increasingly popular among travelers who prioritize their mental health. However, the focus on mental health also presents several challenges for camping tourism. First, there is the challenge of meeting the diverse needs of travelers who prioritize well-being. While some may seek solitude and quiet reflection, others may desire community-oriented wellness experiences. Catering to these varying preferences requires flexibility and careful planning. Another challenge is the need for adequate training and infrastructure to support mental health-focused offerings. Providing a meaningful well-being experience often requires qualified staff, from wellness coaches to meditation guides, as well as safe, calming environments conducive to relaxation. Finally, as the world becomes increasingly interconnected, a shift toward collaborative and participatory culture has begun to redefine how travelers engage with their surroundings. The most significant opportunity this trend offers is the potential for creating deeper connections among travelers and between travelers and local communities. Camping has always been associated with group activities and communal living, making it an ideal setting for fostering shared experiences. Whether it's through group hikes, campfire storytelling, or co-learning experiences like workshops or wilderness survival courses, campsites can cater to this desire for collaboration by encouraging social interaction and cooperative activities. Offering community-driven programs, such as shared cooking experiences, group environmental projects, or volunteer opportunities in local conservation efforts, allows travelers to contribute to the places they visit while forging meaningful connections with others. However, the rise of collaborative and participatory culture also presents challenges for camping tourism.

One key challenge is ensuring that the participatory experiences remain authentic and aligned with the values of camping, rather than feeling forced or contrived. As more campsites adopt participatory approaches to cater to traveler demands, there is a risk of over-commercializing these experiences or creating superficial activities that don't provide true engagement. Camping providers need to carefully curate their offerings to ensure they foster genuine interaction and contribute positively to the environment or community, rather than simply offering token activities to check a box. Another challenge is managing group dynamics and the different preferences and needs of travelers who participate in collaborative activities.

5. CONCLUSION

Camping tourism in Croatia offers immense potential, shaped by emerging global trends that present both challenges and opportunities. This paper has explored the key developments influencing the sector, including the growing preference for authenticity, heightened environmental consciousness, increased focus on mental health and well-being, and the rise of collaborative and participatory culture. These trends are transforming the expectations of tourists and redefining what camping experiences should offer. A key opportunity for enhancing camping tourism in Croatia lies in the rising demand for campsites. Croatia is uniquely positioned to capitalize on this trend, offering abundant green spaces and fresh air, exactly what many travelers seek as they look to escape to quieter, cleaner environments. The country's diverse climates and geographical features provide a wide variety of camping experiences, all within a relatively compact area. Furthermore, Croatia's well-developed transportation network allows for easy and quick access to different camping locations. To fully tap into this potential, Croatia must adapt its offerings to align with the evolving preferences of modern tourists, who are influenced by technological advancements, changing lifestyles, and new ways of spending their leisure time. The contribution of this paper lies in its comprehensive examination of camping tourism in Croatia through the lens of current global trends and local context. By analyzing the development of the industry, reviewing the regulatory framework, and identifying both challenges and opportunities, the paper offers valuable insights into how Croatia can enhance its position in the camping tourism sector. This paper has some limitations to acknowledge. First, our review relies on existing literature and trends without incorporating primary data from tourists or campsite operators in Croatia. Future research could provide deeper insights by including surveys or interviews with these stakeholders to better understand visitor preferences, satisfaction, and the challenges faced by operators. Moreover, while the paper focuses on global trends and their influence on Croatia, it may overlook specific regional dynamics within the country. Further research could investigate regional variations in camping tourism demand, infrastructure, and environmental impacts across Croatia's diverse landscapes.

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DIGITALISATION AS A DRIVER OF EXPECTED PERFORMANCES IN SMEs

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ABSTRACT

The Fourth Industrial Revolution, which involves the integration of digital technologies, is a crucial driving force for small and medium-sized enterprises (SMEs). This technological era significantly influences SMEs' digital, social, and economic needs, leading to transformation in their operations and expected performance. Industry 4.0 utilizes digital technologies to increase innovation, efficiency, and competitiveness across all sectors. Digitalization is not an option for SMEs but is necessary to thrive in today's interconnected and fast-paced business environment. Hence, the paper seeks to explore the impact of key factors such as attitudes toward digitalization, self-efficacy in digitalization, and expected effort on expected performance within SMEs. The research design relies on data collected in multi-country surveys, encompassing SMEs from various business sectors. To identify significant relationships and dependencies, regression analysis was employed, while the Crombach Alpha coefficient was used to examine internal consistency. The research results indicate that there is a dependency between the mentioned factors, which contributes to fostering positive attitudes towards digitalization and expected efforts in the context of digital transformation within SMEs' performance.

Keywords: *Digitalisation, Expected performance, Attitudes toward digitalization, Self-efficacy in digitalization, Expected effort*

1. INTRODUCTION

With the introduction of new business models and transformation through the integration of contemporary digital technologies (Lee et al., 2015), the fourth industrial revolution, or Industry 4.0, represents a significant turning point in the growth of the global economy (Amaral & Peças, 2021). Industry 4.0 encompasses a wide range of innovations, including the Internet of Things (IoT), artificial intelligence (AI), robotics, machine learning, and big data analytics (Castelo-Branco et al., 2019). These technologies enable not only the improvement of production processes (Lee et al., 2015), but also the improvement of services, management, and supply chains (Dallasega et al., 2018). The primary goal of implementing Industry 4.0 in practical settings is to boost company competitiveness and performance (Vrchota et al., 2019). Large companies are no longer the only ones who discuss Industry 4.0. Conversely, realizing Industry 4.0's potential is essential to helping small and medium-sized enterprises (SMEs) become more productive (Ganzarain and Errasti 2016). In this light, SMEs are greatly impacted by the changes brought about by Industry 4.0, even though they still do not see Industry 4.0 as very important to them (Milošević et al., 2022). SMEs associate Industry 4.0 with abstraction and are not sure how to approach it and implement it in real business practic (Vrchota et al., 2019).

Würtz and Kölmel (2012) identified potential issues with deploying smart factories in smaller businesses. However, this does not lessen the significance of Industry 4.0's potential. It is anticipated that Industry 4.0 and its constituent parts will fundamentally alter how all businesses, industries, and eventually the entire society operate (Šlusarczyk 2018). Besides digitization represents a great challenge, it also offers an opportunity to improve quality, efficiency, flexibility, and the capacity to adapt to dynamic market conditions (Milošević et al., 2022). SMEs adopting digital technologies can achieve a significant competitive advantage (Tick et al., 2022). Although there is a significant amount of research that deals with the impact of digitalization on the performance of small and medium-sized enterprises (SMEs), there is almost no research that investigates the common impact of attitudes toward digitalization, self-efficacy in the application of digital technologies, and expected effort on the expected performance of SMEs. Previous research has mostly focused on individual factors, such as technological adoption and readiness (Venkatesh et al., 2003), however, there is a lack of integrated models that analyze how these factors together affect expected performance in SMEs. By examining how these factors interact in the context of Industry 4.0, this paper aims to close a significant research gap that has been left in the literature. Hence, the paper aims to explore the key factors that influence SMEs' readiness for digitization and their business performance. The research focuses on three basic elements: attitudes toward digitization, self-efficacy in applying digital technologies, and the expected efforts that SMEs invest in transforming their business to enhance their performances. Taking into account different business sectors and contexts in several countries, the research is based on data collected through survey questionnaires. Regression analysis was used to analyze the collected data to identify significant relationships and dependencies between the mentioned factors. The research results indicate a strong connection between positive attitudes towards digitization and the willingness of small and medium-sized enterprises to invest the necessary efforts in the digital transformation process. This suggests that building a positive mindset about digitization, along with developing competencies and confidence in applying new technologies, is key to achieving expected performances in SMEs.

2. LITERATURE REVIEW

The implementation of Industry 4.0 technologies in SMEs faces numerous challenges, with attitudes towards digitization, self-efficacy, and expected efforts are a prerequisite in achieving the expected business performance. Lack of knowledge and understanding of technologies often affects negative attitudes toward digitization, which limits SMEs in recognizing the benefits of Industry 4.0 (Chonsawat & Sopadang, 2020). However, Schlichter and Nielsen (2022) indicate that SMEs are becoming more and more positive attitude toward the digitalization of business since it is the only way to advance in a competitive environment and achieve business performance. Higher levels of self-efficacy in digital skills among employees are likely to have a favorable impact on the expected performance inside the SMEs (Santoro et al., 2020). Chonsawat and Sopadang (2020) provide evidence in support of this claim, stating that low self-efficacy makes it difficult for a company to evaluate and adjust to new technology demands, which further decreases the motivation to make the required investments in digital transformation. It can significantly affect the limited ability of SMEs to make decisions about the application of Industry 4.0 technologies and, thus, achieve the expected performance. Digitization efforts should reflect user requirements. Expected digitization efforts aimed at improving company performance could contribute to improving efficiency, and competitiveness, reducing costs, and better data management (Buer et al., 2021). Moreover, the theory of expected behavior (Ajsen, 1991) looks at the expected effort and how much the readiness to adopt new technology and better performances can be affected by the impression of effort.

As a result, the following hypotheses have been established:

H1. A positive attitude regarding digitization affects the expected performance of SMEs
H2. Self-efficacy in digital applications positively affects the expected performance of SMEs
H3. Expected effort in digital applications positively affects the expected performance of SMEs

The conceptual model was creted and presented in Figure 1 based on the literature review.

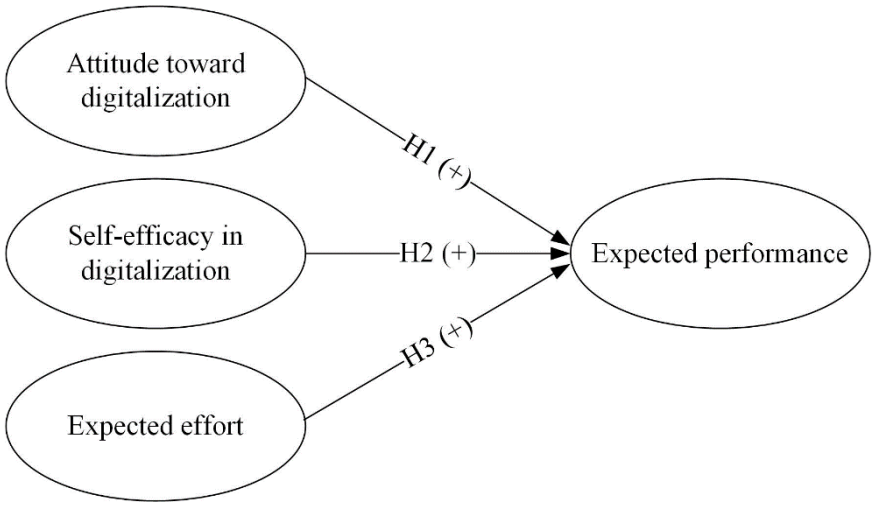

Figure 1: Theoretical model

3. METHODOLOGY

3.1 Sample and collection of data

The aim of this study is to investigate how employee attitudes towards digitalization, self-efficacy in digitalization, and expected effort impact the expected performance of SMEs. The research employed an online questionnaire with four groups of questions, and 635 respondents participated. The target audience included company owners, managers, and employees from Serbia, the Czech Republic, Hungary, Slovakia, and Poland.

3.2 Analysis of research results

In the paper, an exploratory factor analysis (EFA) was carried out to summarize a large number of observed variables into a smaller number of factors, which represent latent variables. After that, a regression analysis was applied to a sample of 635 respondents, which is in line with the recommendation that the sample size be at least ten times larger than the number of observed variables (Roscoe, 1975; Hair et al., 2010). The investigated factors were employees' attitudes towards digitalization, self-efficacy in digitalization, and expected effort in the implementation of digitalization, which were treated as independent variables. The institutional variable in the study was expected performance. The results of the exploratory factor analysis are presented in Table 1.

Table following on the next page

Observable variables	Component			
	1	2	3	4
Attitude toward digitalization (AD)				
Q1	0.527			
Q2	0.705			
Q3	0.779			
Q4	0.717			
Q5	0.643			
Self-efficacy in digitalization (SE)				
Q1		0.746		
Q2		0.895		
Q3		0.895		
Q4		0.866		
Expected Effort (EE)				
Q1			0.811	
Q2			0.782	
Q3			0.819	
Q4			0.816	
Expected Performance (EP)				
Q1				0.754
Q2				0.805
Q3				0.818
Q4				0.760
Q5				0.797
Q6				0.652
Q7				0.717

Table 1: The exploratory factor analysis results

Correlation analysis was used to investigate the relationship between the two sets of questions. To quantitatively show their connection, the correlation coefficient was calculated, and the results are shown in Table 2. The Cronbach Alpha coefficient was evaluated, which was used to assess internal consistency. The reliability value for the whole measurement instrument is 0.937, aligning with Nannalli's (1978) recommendation that values should exceed 0.7. This confirms the strong internal consistency of the measurement instrument.

Variables	AD	SE	EE	EP
AD	1			
SE	0.287	1		
EE	0.736	0.216	1	
EP	0.601	0.082	0.662	1

Table 2: Coefficient of Cronbach Alfa and the Correlation coefficient

In the next step, a regression analysis was performed. Regression deals with predicting the relationship between two variables. Based on the known value of one variable, the value of another variable can be accurately predicted (Ho, 2006). For this reason, regression analysis was carried out to estimate the functional relationship between two or more variables. This research analyzes the influence of employees' attitudes, their self-efficacy, and expected performance on the expected performance of SMEs.

The R Square Change value is 0.622, indicating that 62.2% of the variance in the dependent variable is explained by the controlled variables, as presented in Table 3. This suggests that the Expected Performance is influenced by Attitudes toward digitalization, Self-efficacy, and Expected Effort.

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	0.789a	0.622	0.620	0.66032	0.622	3450.682	3	630	0.000
a. Predictors: (Constant), EE, SE, AD									
b. Dependent Variable: EP									

Table 3: Model Summary

A regression analysis was conducted to determine whether Attitudes toward digitalization, Self-efficacy, and Expected effort have a significant impact on Expected Performance (Figure 2 and Table 4). The Variance Inflation Factor (VIF) was used to assess the level of multicollinearity (Cohen and Cohen, 1983), with the results shown in Table 4. Low VIF values for Attitudes toward digitalization, Self-efficacy, and Expected Effort indicate minimal overlap in the predictive power of these independent variables. However, VIF values exceeding 10 are considered problematic (Ho, 2006), which was not observed in this study.

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	0.474	0.122		3.895	0.000		
	AD	0.517	0.032	0.521	16.201	0.000	0.580	1.724
	SE	0.031	0.022	0.036	1.377	0.169	0.901	1.109
	EE	0.360	0.032	0.346	11.218	0.000	0.630	1.588
a. Dependent Variable: EP								

Table 4: Beta Regression Coefficients

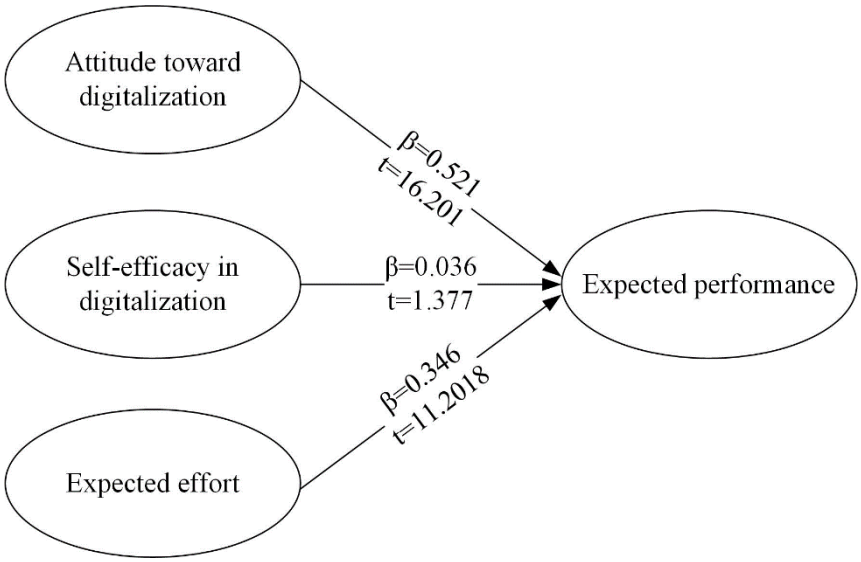

Figure 2: Regression model

This study provides a deeper insight into the relationships between employees' attitudes towards digitization, their self-efficacy in the application of digital technologies, and expected efforts in relation to the expected performance of SMEs. The research results show that the factors of employees' attitudes towards digitization and expected effort significantly influence the expected performance of SMEs, whereby hypotheses H1 and H3 are confirmed, which is in agreement with the research (Venkatesh & Davis, 2000; Buer et al., 2021; Schlichter and Nielsen; 2022). Hypothesis H2 is rejected due to the lack of statistical significance. This finding is in line with Chonsawata and Sopadanga (2020), who points out that low self-efficacy reduces the ability of companies to adapt to technological changes, which additionally affects the lower willingness to invest in digital transformation and limits the achievement of the expected performance of SMEs.

4. CONCLUSION

The research provides valuable insights into the factors that influence the expected performance of small and medium-sized enterprises (SMEs) in the context of Industry 4.0. The findings of this study indicate the importance of creating positive attitudes of employees about the application of Industry 4.0 technologies, as well as the necessity of investing in the expected digital efforts in order to achieve the expected performance in SMEs. Also, the findings of this research suggest that it is necessary to motivate employees to increase their self-efficacy, which in many ways can contribute to the acceptance of technological changes, which will be reflected in the improvement of the performance of SMEs. This study fills a theoretical gap in the literature by increasing understanding of the combined effects of attitudes, self-efficacy, and expected effort during the digitization process on SME business performance. The research contributes to the creation of more thorough models for analyzing the success of SMEs in the Industry 4.0 era by shedding light on several elements that influence the successful implementation of digital transformation. The practical implications of this research suggest that SME managers should pay attention to the development of a positive attitude of employees towards digitization and clearly define the expected efforts in the transformation process. These actions are necessary to achieve successful performance and ensure long-term success in the digital environment. Also, the findings of this study can illuminate the path for managers to identify barriers related to self-efficacy to provide adequate support to improve employees' abilities to successfully adopt Industry 4.0 technologies. This study has several limitations. First, the use of questionnaires can cause respondent bias and reliance on subjective self-reports, which reduces the objectivity of the data. Second, the study analyzes three factors without including other important factors that can significantly influence the success of digitization.

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TAX POLICY AND ECONOMIC GROWTH – A REVIEW OF THE LITERATURE

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ABSTRACT

The main function of taxation is to raise the financial resources necessary for the performance of public sector main functions. At the same time, the organisation of the tax system and individual taxes also influence the ability of government to carry out these functions. The economic effects of tax policy have long been the object of academic interest with a view of drawing conclusions and formulating relevant recommendations about the directions of tax reforms in a growth-friendly manner. In particular, an extensive research body has been devoted to the manners in which tax policy impacts output growth. The better understanding of this causal relationship allows for improvement of the balance between the various types of taxes as well as the organisation of individual taxes. Against this background, the objective of the present paper is to provide a synthesis of the theoretical and empirical studies on the impact of tax policy on economic growth. Thus, the paper tries to answer the question how the tax system can be constructed so as to boost economic growth without compromising fiscal revenue. Such a perspective is important in the context of globalisation and growing pressure on national public finances. An original contribution of the paper is the separate systematisation of the effects related to the structure of the tax system and those those related to the type of tax reform.

Keywords: *Taxation, Tax policy, Tax reforms, Economic growth*

1. INTRODUCTION

Tax policy's main function is to raise the financial resources necessary for the performance of government functions, namely income redistribution, resource allocation and macroeconomic stabilisation (Musgrave and Musgrave, 1989). All three functions are equally important in modern societies, but at the same time they require different policy approaches; therefore, their balancing requires good understanding of the specific ways in which individual taxes and the overall tax mix impact economic growth. At the same time, the fiscal outcomes of the public sector largely depend on the behavioural responses of market participants towards the organisation of the tax system and the changes in tax policy. The economic impact of tax policy has long been the object of research with a view of drawing conclusions and formulating relevant recommendations about the directions of tax reforms. Moreover, long-term challenges such as population ageing, climate change and digitalisation also increase the pressure and create new tasks for national public finances. In the EU, tax policy has become an even more important topic since fiscal policy is the only policy instrument available for individual euro area countries. Against this background, the present paper has as its objective to conduct a concise yet thorough review of the relevant literature on the impact of tax policy on output growth. The effects of tax policy can be distinguished according to the type of tax reform and the type of tax instrument. The paper is structured as follows: section two presents the results of the most significant studies studying the impact of fiscal reforms (both taxes and public expenditure) on output growth; section three on its part is devoted to summarising the results of the research on the impact of tax structure; and part four concludes.

2. EFFECTS BY TYPE OF TAX REFORM

In a neoclassical setting, growth simply depends on the accumulation of physical and human capital. In the long-run, any given tax structure generates an equilibrium capital/ labor ratio and an equilibrium level of education per worker. Any further growth in per capita output simply arises from an exogenous rate of technical change. There should be no permanent effects of the tax structure on the growth rate in per capita output, regardless of the size of the misallocations generated by the tax structure (Lee and Gordon, 2005, p. 1029). In contrast, according to the more recent endogenous growth models, investment in human and physical capital affects the steady-state growth rate, and consequently there is scope for at least some elements of tax and government expenditure to play a role in the growth process (Kneller, Bleaney and Gemmell, 1999). These new models explicitly model the processes through which growth is generated and, by doing so, can trace the effects of taxation upon the individual decision-making that lies behind them (Myles, 2000, p. 142).

There is an overall consensus among economists about the negative impact of high tax rates on economic performance. Engen and Skinner (1996, p. 4) distinguished the following channels through which high taxes can negatively affect output growth:

- first, discourage the investment rate (the net growth in capital stock);
- second, discourage labour market participation and distort occupational choices or the acquisition of skills and education;
- third, discourage productivity growth by attenuating research and development;
- fourth, reduce the marginal productivity of capital by distorting investment from heavily-taxed sectors to light-taxed sectors with lower overall productivity;
- fifth, distort the efficient use of human capital by discouraging workers from employment in sectors with high social productivity but a heavy tax burden.

From a theoretical perspective, base broadening is assumed to reduce distortions within the tax system, making it more homogenous. This may foster economic efficiency because resources are reallocated to the most profitable investments (Gechert and Gros, 2019, p. 4). In the past decades, the implications of the changes in tax systems on output growth have been extensively studied in the specialised economic literature. Most empirical studies are based on panel data combining cross-country and time-series analysis. However, as Engen and Skinner (1996, p. 8) noted, the results of these studies were highly sensitive to the assumptions embedded in models used and consequently, these studies reached different conclusions about the magnitude of the increase in economic growth.

The research interest in this scientific area has grown further after the euro area debt crisis as the latter required significant efforts for fiscal consolidation in the EU Member States but at the same time the mitigation of the negative social and economic implications of the recession required expansionary policy measures. As Alesina and Ardagna (2010, p. 35) pointed out, tax measures cannot be entirely separated from spending measures as both sides of the budget interact. Due to this reason, most studies take into consideration not only the revenue side of public budgets but also the expenditure side and study their combined effects on economic performance. According to Engen and Skinner (1996, p. 33) beneficial changes in tax systems can have modest effects on output growth. In particular, a major tax reform reducing all marginal tax rates by 5 percentage points and average tax rates by 2.5 percentage points would increase long-term growth rates by 0.2-0.3 percentage points, but without the possibility to predict whether these effects are permanent or transitory. They (Ibid., p. 20) also suggested that the combined effect of distortionary taxes and beneficial government expenditures may yield a net improvement in the functioning of the public sector.

Alesina et al. (1999) analysed the effects of fiscal policy (both taxes and expenditure) on firms' profits and investments in the OECD countries. Their results showed that tax increases reduce profits and investments and vice versa, but the magnitude of these tax effects is smaller than those on the expenditure side (Ibid., p. 4).

On the basis of a panel study in OECD countries, Lane and Perotti (2001) analysed how the composition of a shift in fiscal policy (expenditure and taxes) influences on the traded sector of the economy. They concluded that fiscal reform that takes the form of a reduction in wage government spending will crowd in an expansion in traded output and employment and improve the level of profitability. On its part, a reform that consists of an increase in labor taxation will have the opposite effect on the traded sector (Ibid., p. 26).

Alesina and Ardagna (2010, p. 37) found that tax cuts are more expansionary than spending increases in the cases of a fiscal stimulus, whereas for fiscal adjustments spending cuts are much more effective than tax increases in stabilising the debt and avoiding economic downturns.

According to Dabla-Norris and Lima (2018, p. 1) there is some theoretical support for differences between the economic consequences of tax rate versus base changes. Rate changes typically affect all taxpayers, or at least a large number of them, whereas base changes are often targeted at certain groups (for example specific industries, low-income taxpayers), certain income sources (e.g., capital income), or certain goods (e.g., reduced VAT rates on basic goods). These authors pointed also that base broadening can be less distortionary if it targets agents that are taxed less than the average. This is because base broadening often tends to make taxation across sectors, firms, or activities more homogeneous, contrary to rate increases.

Barrios et al. (2022, p. 26) emphasised on the difficulties to provide an ex-ante assessment of discretionary tax measures because the assessment must clearly identify the channels through which these measures might impact the economy, especially so in the case of tax cuts intended to foster economic activity. Policy makers must anticipate possible behavioural effects (e.g. in terms of increased labour supply or increased consumption) in order to possibly argue that at least part of the tax revenue losses entailed by the tax cut are recovered through increased employment (consumption). The same applies to tax hikes. These authors conducted a study on the macroeconomic effects of an unanticipated 1 per cent increase in tax receipts in a panel of EU countries. Their results suggested suggest that a medium-term deterioration of GDP growth by 2 percentage points can be expected as Member States increase tax revenues (Barrios et al., 2022, p. 17).

Gechert and Groß (2019, p. 2) investigated the impact of changes of specific tax types and made a distinction between rate and base changes on growth, as measured by GDP per head and income inequality, as measured by the Gini coefficient. Their research showed that base broadening is less harmful to economic growth than tax increases in tax rates.

Amaglobeli et al. (2022) assessed the impact of tax policy changes on tax revenues while accounting for anticipation effects and controlling for contemporaneous changes in taxes. Their empirical findings (2022, p. 3) showed that the revenue yield of tax policy changes varies significantly across taxes and types of changes, with tax rate changes generally having a more transitory revenue impact than tax base changes for most taxes.

Specifically, base broadening changes in PIT, CIT, excise duties, and property tax have on average a more significant and long-lasting impact than rate changes. At the same time, rate hikes have relatively more significant effects on taxes in the case of VAT and SSC measures.

According to Barrios et al. (2022, p. 4) the assessment of the budgetary impact of a discretionary tax revenue measures should take into account any behavioural responses and second-round effects on economic activity. Such ex-ante assessment of tax reforms must inform about the mechanisms through which these potentially impact the economy, especially in the case of tax cuts which are expected to trigger economic activity. These authors constructed a model for the assessment of first-round and second-round effects of discretionary tax measures. An important conclusion of their empirical estimations, which is contrary to what is sometimes suggested in political discourse, the second-round revenue impact of personal income tax reforms is found to be small relative to the first-round microsimulation results. In other words, the supply side effects are not strong enough to prevent tax cuts from being revenue losing, hence the tax cuts do not pay for themselves (p. 26).

3. EFFECTS BY TYPE OF TAX

Another line of research has been devoted to investigating the implications of individual taxes on economic growth. Every fiscal instrument influences differently the behavior of market participants; hence it impacts differently the tax base and amount of revenue. Therefore, the understanding of the economic and fiscal effects of individual taxes can lead to a better organisation of the overall tax mix. A tax is considered efficient if it does not affect resource allocation and cannot be legally avoided through changes of market participants' behaviour. Kneller, Bleaney and Gemmell (1999, p. 173) distinguished as distortionary the taxes which affect the investment decisions of agents (with respect to physical and/or human capital), creating tax wedges and hence distorting the steady-state rate of growth. On its part, non-distortionary taxation does not affect saving/investment decisions because of the assumed nature of the preference function, and hence has no effect on the rate of growth.

Generally, it is considered in the specialised literature that the taxes on capital and labour affect most strongly resource allocation and economic growth. On their part consumption and property taxes are associated with smaller distortions in market participants's choices; hence, they do not affect output growth so negatively. This is due to the high capital and income mobility within the context of digitalisation and globalisation. Another important advantage stemming from tax base immobility is the difficulty for evasion. Unlike capital, property cannot shift location and it cannot be hidden (Slack and Bird, 2014, p. 3).

The tax burden on society can be measured by tax rates and tax revenue to GDP ratio (Angelov and Nikolova, 2021, p. 32). The main advantage of the analysis on the basis of tax structure rather than of tax levels, measured as a tax to GDP ratio, is that it provides revenue-neutral tax policy changes which remove the difficulties related with the question of how aggregate tax revenue changes relates with expenditure changes (Arnold et al. 2011, cited in Neog and Gaur, p. 2).

Atkinson and Stiglitz (1976) examined the interaction between different types of taxes (direct and indirect) in terms of efficiency, horizontal and vertical equity. According to these authors if the government had no distributional objectives and was concerned solely with efficiency, it may employ only direct taxation in the form of a poll (lump-sum) tax. However, in its pure form such a tax exists only in theory and serves as a benchmark against which inefficiency of other taxes is measured.

According to these authors, the extent to which indirect taxes are employed to this purpose depends on the form of consumer preferences and on the restrictions (if any) on the type of income taxation employed. If a general income tax function may be chosen by the government, where the utility function is separable between labor and all commodities, no indirect taxes need be employed. In this case, the use of consumption of particular commodities as a screening device offers no benefit. Finally, horizontal equity considerations may impose constraints on the structure of taxes which may be levied (Atkinson and Stiglitz, 1976, p. 74).

Mendoza et al. (1995) considered the effect on economic growth of the marginal tax rates on human and physical capital as well as consumption. These authors implied that consumption taxes also affect the net after-tax rate of return on physical capital indirectly via the labour - leisure choice, which in turn impacts the capital-to-labour ratio employed in production (Mendoza et al., 1997, p. 104 cited in McNabb, 2018, p. 175).

In a previously mentioned study, Alesina et al. (1999) found that taxes on labor have the largest effects on profits as higher labour taxes imply higher pre-tax wage demands by workers.

Kneller, Bleaney and Gemmell (1999) examined the growth effects of fiscal policy (taxation and public expenditure) for a panel of 22 OECD countries during 1970–95. They found that distortionary taxation reduces growth, whilst non-distortionary taxation does not. As distortionary were classified the taxes that affect the investment decisions with respect to physical and/or human capital, creating tax wedges and distorting the steady state growth of the economy (p. 4).

According to this criterion their model considered as distortionary the taxes on income and profit, social security contributions, taxation on payroll and manpower taxation, and property taxation. Only consumption taxes were considered as non-distortionary in their model (p. 24). Investigating the impact of tax structure on output in a panel of 70 countries, Lee and Gordon (2005, p. 1041) also confirmed the existence of a strong negative correlation between CIT rates and economic growth. Their estimates suggested that cutting the corporate tax rate by 10 percentage points can increase the annual growth rate by around 1.1%. An interesting finding of their empirical analysis was that lower CIT rates would lead to lower PIT revenue due to the increase of entrepreneurial activities at the expense of employed labour supply.

Johansson et al. (2008) conducted an extensive study on the impact of main types of taxes on economic growth with a view of drawing relevant conclusions for OECD countries. According to these authors, the scientific evidence about the effects of individual taxes can be applied to achieve efficiency gains from replacing part of the revenues from distortionary taxes with revenues from less distortionary taxes for a given overall level of the tax burden. Among their most important conclusions were that taxing consumption and property exerts significantly less adverse effects on GDP than taxing income and capital. Recurrent taxes on land and buildings in particular are the least detrimental to the economy due to their immobile base; thus, these taxes cannot change taxpayers' choices with regard to consumption, investment and labour supply and demand. Tax base immobility is an especially important advantage in the context of globalisation when capital and to a large extent labour become increasingly mobile across countries. On the other hand, corporate income taxes appear to have a particularly negative impact on GDP per capita (Johansson et al., 2008, p. 42).

Macek (2014) used a regression analysis in OECD countries for the period of 2000 – 2011 to evaluate the impact of individual types of taxes on economic growth. His results confirmed the theoretical assumption that an increase of the CIT rate lowers the return of capital, inflow of FDI, employment or investment into the human capital, and through these channels it also affects the economic growth (p. 323). As far as the tax burden approximated by tax quota is concerned, the negative relation between economic growth and personal income taxes and social security contributions was also verified while for the property tax, the negative relation with economic growth was not confirmed (p. 324)

McNabb (2018) conducted a study on the relationship between tax structures and economic growth in a panel of 100 countries. His results confirmed earlier findings that revenue-neutral shifts from consumption and property taxes toward income taxes are associated with lower GDP growth rates. However, the magnitude of the effect differs at different income levels, with the strongest negative effects seen in upper-middle-income countries, and no significant effects seen in lower-middle-income countries. Personal income taxes and social contributions were confirmed as most harmful for long-run GDP growth rates, but no evidence was found to support the theory that increases in corporate income taxes are harmful for growth rates. With regard to the positive effects of property tax increases on economic growth, McNabb suggested that while this may be the case for high-income countries, revenue-neutral increases in property taxes in low-income or middle-income countries might have limited or indeed detrimental effects on long-run GDP growth rates (p. 199).

Gechert and Gross (2019) found that income and corporate tax rate increases are more effective in reducing inequality than indirect taxes but seem more harmful to economic growth.

On the basis of an empirical study on the long-run and short-run relationship between different tax structure and economic growth in states of India, Neog and Gaur (2020) confirmed that property taxes showed a 'U'-shaped relationship with states' growth performance which implies that a rise in property taxes is bad for growth initially and after a threshold point, it becomes growth enhancing (p. 7). Commodity and service taxes are negatively related to the growth in per-capita state domestic product.

In another empirical study, Angelov and Nikolova (2021) analysed the tax burden in the Balkan countries and also confirmed the existence of a negative relationship between high taxes and output growth. According to the authors, the increase of overall tax burden and raise the share of the income taxes can be regarded as one of the reasons for the lower growth in several of the countries included in their research (Angelov and Nikolova, 2021, p. 37).

Barrios et al. (2016, p. 1) found that the impact of tax expenditure on tax revenues and on income inequalities can be sizeable. The redistributive impact of removing tax expenditures can go both directions, either on the progressive or regressive side, depending on the country and the tax expenditure considered. This result points out to the importance of a careful country specific scrutiny, for each type of tax expenditures. From a public finance perspective, tax expenditures entail a cost in terms of foregone revenues compared to the benchmark tax system, which might be more difficult to justify in times when substantial consolidation efforts are required, (see Kalyva et al., 2015). In such a context, cost-benefit analysis of tax expenditures is particularly warranted.

In a recent study, Angelov (2024) analysed the tax burden on labour in EU Member States which is composed by personal income tax and social security contributions. The author's results showed that in most of the countries, employers bear quite a large part of the tax and social insurance burden, which can be seen as a negative aspect of employment seeking. In other countries, a highly progressive tax on labour income combined with additional social security contributions at the expense of employees can result in a deterrent to labour supply (Angelov, 2024, p. 38).

4. CONCLUSION

Significant academic interest has been devoted to the possibilities of tax policy to reduce market distortions and boost economic growth without compromising fiscal revenues. However, as Addison, Niño-Zarazúa and Pirttilä (2018, p. 164) put it, despite the relatively extensive literature that explores the relationship between tax policy and growth and how the tax structure of nations impact efficiency and equity considerations, significant knowledge gaps still exist in better understanding the underlying structural, institutional and normative factors that have permitted (or limited) the building of effective states as conditio sine qua non for economic and social progress. For this reason, tax policy remains an area where individual countries choose different approaches with regard to the design of individual taxes and overall tax systems as well as the direction of tax reforms. The review of the literature in the present paper has confirmed that base increases are preferable to rate increases as the former do not distort economic activities and output growth in such an extent as the latter. However, a limitation in this paper arises from the fact that only the impact of public revenue on economic growth is accounted for while most empirical studies take into the consideration also the effects of public expenditure in the analysis of the impact of fiscal policy changes on economic growth. With regard to the effects of the tax structure, there is wide agreement among economists backed with empirical evidence that due to their mobile base, income taxes distort economic decisions with regard to labour supply and demand, savings and investments. Consumption taxes, on the other hand, are considered to be less distortive; however, they do not take into account the differences in taxpayers' socio-economic conditions. Finally, property taxes have much smaller role in modern fiscal systems, but they have a potential to overcome some of the shortcomings of other types in terms of economic efficiency.

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PERCEPTION OF HRD INNOVATION FACTORS: FOCUS ON SMES

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ABSTRACT

This study aims to characterize groups of small and medium-sized enterprises (SMEs) based on their perceptions of factors derived from innovative human resource development (HRD) activities. Based on the results of a questionnaire survey, exploratory factor analysis (EFA) was conducted to identify factors derived from innovative HRD activities reported by SMEs. Subsequently, the K-means clustering method was employed to categorize respondent profiles based on these identified factors. The authors identified two main factors related to innovative HRD activities: the first focuses on enterprise systems to support innovative HRD activities, while the second centers on innovative employee engagement. Three distinct groups of respondents were identified, with the first factor being the most influential. These findings indicate that SMEs are segmented into groups of traditionalists, conservatives, and innovation leaders, each exhibiting unique behaviors in their perception of innovative HRD activities.

This study underscores the importance of factor identification and respondent grouping in the national context. Future research should focus on the comparison of regional differences among several countries. It is recommended that SME management develop innovative HRD systems to enhance the effectiveness of their activities and enterprises' competitiveness, better adapt to changes, and improve their innovativeness. Previous research explored mainly the impact of HRD activities on innovation of enterprises and they have predominantly focused on large enterprises and corporations. This study contributes to expanding this knowledge base by focusing on SMEs and emphasizing innovation within HRD activities.

Keywords: *Human resource development, Small and Medium-sized enterprises, Factor, Characterisitc Groups of Respondents.*

1. INTRODUCTION

While there is a growing body of research highlighting the role of human resource development (HRD) in fostering the innovativeness of small and medium-sized enterprises (SMEs), studies of the innovation of HRD are still missing. Most studies have predominantly focused on specific aspects such as human resource management (HRM), strategic human resource management (SHRM), employee creativity, and leadership roles in shaping innovation. Shahzad et al. (2022) in their study discovered that human resource management (HRM) practices and collective organisational commitment act as mediators in the relationship between innovation performance and entrepreneurial orientation (EO). Similarly, EO exerts an indirect influence on innovation, due to its impact on dynamic capabilities. The results also indicate that EO strengthens the positive relationship between dynamic capabilities and innovation, with this relationship becoming more pronounced at higher levels of EO. The findings of Ho et al. (2024) corroborate the assertion that strategic human resource management (SHRM) exerts an indirect, positive influence on innovation through its impact on dynamic capabilities. Ferrarini & Curzi (2023) in their study investigated the direct and indirect relationships between ability, motivation, and opportunity (AMO) enhancing practices and firms' innovation capacity, with a

particular focus on the potential mediating role of open inovation (OI). The findings indicated that firms that invest in AMO practices are not only more likely to engage in innovative activities but also demonstrate a greater propensity to collaborate with external partners. Furthermore, OI not only enhance a firm's innovation capacity but also partially mediate the relationship between human resource management (HRM) and organisational innovativeness. The results of study by Haar et al. (2022) demonstrate a positive correlation between the implementation of a High Performance Work System (HPWS) and a firm's human capital and innovation. Furthermore, the direct impact of HPWS is partially mediated by human capital. The objective of the study conducted by Alsoani and Al-Dhaafri (2023) was to investigate the impact of innovative culture on human resource management practices from both theoretical and empirical perspectives. Additionally, the researchers sought to examine the role of knowledge sharing as a moderating factor in this relationship. The findings indicated that there is a significant and positive influence of innovative culture on HR practices. Furthermore, knowledge sharing is of paramount importance in establishing a connection between innovative culture and HR management.The findings of the study conducted by Zhao et al. (2020) indicated that the innovation performance of employees is contingent upon three key factors: work engagement, employee creativity, and the organisational climate with regard to innovation. Moreover, the study revealed that employee creativity is the most significant predictor of innovation performance. The results of the study by Abdul Ghani Azmi and Hashim (2022) indicate that public agencies exhibit both distinctive and shared characteristics with regard to their implementation of HRM practices that foster innovation. Notably, the selected public agencies demonstrate a clear commitment to HRM practices that genuinely promote innovation, including local training, a diversified range of employee rewards, and a heightened minimum standard for innovation in their performance evaluations. Azeem and Kotey (2023) discovered that flexitime and flexi-leave encourage innovation by providing employees with the mental space and diversity necessary for the creation, sharing and utilisation of knowledge. The authors' findings indicate that managers of SMEs should prioritise the provision of flexible work arrangements, given their significant impact on a company's innovative capabilities. The findings of Torres De Oliveira et al. (2022) indicate that the intensity of relationships with external sources of knowledge has a significant impact on innovation performance, acting as a mediator between the relationships between innovation barriers and innovation performance. Furthermore, the authors posit that the strength of relationships with external knowledge sources can help to mitigate constraints on innovation, facilitate the flow of knowledge, and improve innovation performance in firms in emerging markets. In the context of management, their findings indicate that human resource constraints represent a significant barrier for SMEs, and managers should encourage learning through reward systems and training that enhance absorptive and innovative capabilities. In a recent study, Chaudhuri et al. (2023) identified a connection between human capital and entrepreneurial ecosystems. Furthermore, they highlighted that the ability to leverage corporate digital knowledge and innovation capabilities significantly impacts the entrepreneurial ecosystem. Furthermore, the researchers discovered that technological turbulence has a significant moderating impact on the relationship between digital knowledge and innovation capabilities in entrepreneurial ecosystems. The study by Ghlichlee and Motaghed Larijani (2024) shows, that the concept of servant leadership has been found to exert a considerable influence on the innovative behaviour of employees in the studied firms. Furthermore, the results indicate that organisations which facilitate their employee's innovative behavior tend to observe enhanced knowledge employee performance. Guo et al. (2022) investigated the mediating role of job crafting between inclusive leadership and

innovative work behaviour in China's small and medium-sized industries. The results demonstrated that job crafting is a mediator between inclusive leadership and innovative work behaviour. In the study by Malik et al. (2024) was found out, that strategic agility, versatility, and the enhancement of human resource management approaches in knowledge-intensive SMEs were influenced by the owner-manager or leader's ambidextrous leadership style and their philosophy towards managing people. This influence had a positive effect on the fostering of a culture of trust, participation, risk-taking, and openness, which in turn led to the development of innovative products and services and several positive outcomes at the employee level. Awang et al. (2015) conducted an investigation into the impact of organisational learning and the work environment on the shaping of innovative work behaviour among employees in Malaysian SMEs. The analysis demonstrated that innovative work behaviour is markedly less prevalent in micro-enterprises than in small. The innovation outputs are made up of employees exhibiting highly innovative work behaviour. In conclusion, the statistical data indicated that organisational learning and the work environment play a crucial role in the shaping of innovative work behaviour. In the study the authors Joo et al. (2023) investigated the relationship between empowering leadership and employee creativity, with a particular focus on the mediating roles of work engagement and knowledge sharing. A survey of 302 knowledge workers in a telecommunications company in South Korea revealed that empowering leadership has a positive effect on work engagement and knowledge sharing, which in turn enhances employee creativity. The direct effect of leadership on creativity was not statistically significant; however, an indirect effect through work engagement and knowledge sharing was demonstrated to be significant. The findings of Murabak et al. (2021) indicate that a proactive personality exerts a direct and indirect positive influence on innovative work behaviour through work engagement. Transformational leadership serves to enhance the relationship between a proactive personality and work engagement, with high levels of transformational leadership exerting a particularly pronounced effect on this relationship. Ababneh (2023) conducted a study in which data was collected from 547 employees working for small and medium-sized enterprises (SMEs) in Jordan. The findings revealed that team engagement acts as a mediator in the relationship between individual engagement and team innovative behaviour. The findings of the study by Popa et al. (2022) lend support to the notion that innovation is a complex phenomenon, shaped by a multitude of influencing factors. Consequently, organizations must give close consideration to the advancement of IT expertise and infrastructure, HR selection practices, and organizational capital, as these elements are pivotal to the attainment of enhanced outcomes. The subject of innovations in HRD is not the focus of considerable attention from authors, despite the fact, that the SMEs depend on the innovation of each employee. That's why it is essential to understand how to support employees in fostering their innovative behavior (Viitala et al., 2023). The EU labor market is beginning to show labor shortages at present. Based on forecasts of population development and aging (Grmanová & Bartek, 2022). That's why the question of HRD innovation becomes more important in SMEs. There remains a lack of in-depth understanding of how SMEs perceive and categorize factors derived from innovative HRD activities, particularly in terms of how these perceptions differ across distinct SME groups and how these categories impact the adoption and effectiveness of HRD initiatives. Moreover, while cross-country comparisons of HRD activities are often suggested, few studies have actually explored regional differences in the perceptions and implementation of innovative HRD systems across various national contexts, particularly among SMEs. Additionally, there is limited empirical evidence linking specific clusters of SMEs to distinct HRD strategies that influence their adaptability in the context of innovation. Addressing these gaps is critical for

providing more targeted recommendations for SME management on the development of HRD systems that not only enhance innovative capacities but also take into account the unique challenges and opportunities different groups of SMEs face. This study aims to fill these gaps by focusing on the perception-based categorization of SMEs concerning innovative HRD activities and by suggesting the need for further comparative research across different countries. The main aim is to characterize groups of SMEs based on their perceptions of factors derived from innovative human resource development (HRD) activities. The introduction section provides an overview of the subject matter. The second section outlines the methodology used in the analysis of the data, including the processing procedure and the methods. The third section comprises the results and discussions. The paper finishes with conclusions with a summary of the main implications for future research.

2. RESEARCH DESIGN

In this section we have discussed the study development. The questionnaire was designed and modified to collect data based on the previous research studies (Nguyen & Dao, 2023; Rumanti et al., 2022; Turulja et al., 2023). The questions used in this study are presented in Table 1.

Item	Question
IN1	Information gathered on staff development needs is used to create new training and workshops
IN2	Employee training is carried out to increase the innovative activities of the enterprise
IN3	The innovation of development activities is carried out in our enterprise on a regular basis
IN4	Innovative activities are an integral part of a enterprise's business strategy
IN5	The innovation of educational activities is carried out in our enterprise on a regular basis
IN6	The innovation of the remuneration system is carried out in our enterprise on a regular basis.
IN7	The innovation of performance appraisal is carried out in our enterprise on a regular basis.
IN8	The reward system is designed in a creative and innovative way
IN9	Our enterprise has implemented a system to support innovative ideas of employees
IN10	In our enterprise, employees have the opportunity to participate in the creation of new products/services

Table 1: Items related to HRD innovation is SMEs
(Source: modified by Nguyen & Dao (2023); Rumanti et al. (2022); Turulja et al. (2023))

The responses were measured on a five-point scale (from 1 totally disagree to 5 totally agree) which is useful for questionnaire survey and research. Questionnaires were administered to the respondents by the researchers both personally and with over phone calls. Over 250 questionnaires were administered, and 110 responses were received. Totally 100 responses were filled completely and suitable for data analysis (Kaiser, 1974). The basic characteristics of survey's participants are shown in Table 2.

Participants characteristics	Frequency (%)
Size category:	23.0
micro	34.0
small	43.0
medium	
Type of activity:	
production	34.0
services	66.0
Status in enterprise	
owner	40.8
manager	59.2

Table 2: Characteristic of participants (N=100)
(Source: results of survey)

Data analysis was done using software SPSS and STATISTICA. EFA was conducted with the obtained data to extract the factor structure and to examine the construct validity. Factors were extracted by the maximum likelihood method and rotated by varimax rotation. The number of factors was decided in consideration of the scree-plot, and cumulative variance explained. To assess the internal consistency of the factors, I used Cronbach's alpha, and all identified factors met the required reliability criteria. According to George and Mallery (2003), a Cronbach's alpha value of 0.70 or higher is considered acceptable for reliability in exploratory factor analysis (EFA). In the context of EFA, all items achieved communalities higher than 0.4. This indicates that each item significantly contributes to the common factors. According to Osborne (2014), the communalities above 0.4 for EFA are acceptable. To cluster respondents into similar groups, we used the K-means method based on the identified factors from EFA, applying Ward's method and Euclidean distance.

3. RESULTS AND DISCUSSION

EFA is deemed appropriate when KMO measure of sampling adequacy test index is higher than satisfactory minimum limit 0.7 and higher (Hair et al., 2010). The significance of Bartlett's test of sphericity was less than 0.001, meaning that EFA can be applied to the obtained dataset (Table 3).

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.726
Bartlett's Test of Sphericity	Approx. Chi-Square	329.905
	df	28
	Sig.	0.000

Table 3: KMO and Bartlett's Test (3 factors solution)
(Source: own research)

EFA with Varimax rotation was conducted. In EFA, the total variance explained by the extracted factors was found to be significant, indicating a strong representation of the underlying constructs, which aligns with the recommendations of Kaiser (1970), who suggested that a total variance explanation of at least 60% is desirable for effective factor retention (Table 4).

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	3.413	42.665	42.665	3.413	42.665	42.665	2.324	29.055	29.055
2	1.620	20.253	62.919	1.620	20.253	62.919	2.126	26.575	55.629
3	1.032	12.905	75.824	1.032	12.905	75.824	1.616	20.195	75.824
4	.629	7.869	83.693						
Extraction Method: Principal Component Analysis.									

Table 4: Total Variance Explained (3 factors solution)
(Source: own research)

Loading items of all measures in the constructs were over 0.5 (Table 5), but the results of Cronbach alpha in case of third factor was lover than 0.7 and didn't meet the criterion (Götz et al., 2009) and it was dropped from next analysis. Consequently, as a two factor-solution was obtained, and the exploration process was stopped (Table 6).

	Initial	Extraction
IN1	1.000	.795
IN3	1.000	.675
IN5	1.000	.757
IN6	1.000	.865
IN7	1.000	.861
IN8	1.000	.724
IN9	1.000	.773
IN10	1.000	.617
Extraction Method: Principal Component Analysis.		

Table 5: Communalities (3 factors solution)
(Source: own research)

Table 6 presents the results of first EFA solutions. The analysis of the 10 questions revealed a KMO value higher than the acceptable limit, with Bartlett's test of Sphericity showing significance at 0.000 (Table 3), confirming the three-factor solution with eigenvalues greater than 1, as presented in Table 4.

Item	Factor		
	1	2	3
IN7	.914		
IN6	.911		
IN5	.724		
IN9		.862	
IN8		.830	
IN10		.782	
IN1			.887
IN3			.747
Cronbach's Alpha	.868	.786	.631
Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization. a. Rotation converged in 4 iterations.			

Table 6: The results of EFA and Reliability Statistics (3 factors solution)
(Source: own research)

Cronbach's alpha for each construct did not meet the required level, except for two constructs, which achieved the acceptable threshold of 0.7 or higher and consisted of three or more items (Costello & Osborne, 2005). Consequently, two factor solutions was conducted, while questions IN1 and IN3 were excluded from further analysis. Table 7 shows the results of KMO and Bartlett's test, which values indicates that the results from the EFA were fit to be conducted with the data.

Kaiser-Meyer-Olkin Measure of Sampling Adequacy		.721
Bartlett's Test of Sphericity	Approx. Chi-Square	257.697
	df	15
	Sig.	.000

Table 7: KMO and Bartlett's Test (2 factors solution)
(Source: own research)

The communalities for all items were sufficiently high (above 0.5), indicating that each item contributed significantly to explaining the shared variance among the factors (Table 8).

	Initial	Extraction
IN5	1.000	.723
IN6	1.000	.854
IN7	1.000	.816
IN8	1.000	.726
IN9	1.000	.765
IN10	1.000	.620
Extraction Method: Principal Component Analysis.		

Table 8: Communalities (2 factors solution)
(Source: own research)

The total variance explained by the extracted factors was found to be significant, indicating a strong representation of the underlying constructs (Table 9).

Total Variance Explained									
	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
Component	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	2,917	48,624	48,624	2,917	48,624	48,624	2,390	39,839	39,839
2	1,586	26,440	75,064	1,586	26,440	75,064	2,113	35,224	75,064
Extraction Method: Principal Component Analysis.									

Table 9: Total Variance Explained (2 factors solution)
(Source: own research)

The Rotated Component Matrix revealed two distinct factors (Table 10), with factor loadings exceeding 0.7, indicating a strong association between the items and their respective factors, which is well above the recommended threshold for significant factor loadings according to Hair et al. (2010). The reliability of the constructs was measured using Cronbach's alpha, which values were higher than 0.7 for each factor construct as shown in Table 10.

Table following on the next page

	Factor	
	F1	F2
IN6	.921	
IN7	.893	
IN5	.832	
IN9		.866
IN8		.832
IN10		.785
Cronbach's Alpha	.868	.786
Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization. a. Rotation converged in 3 iterations.		

Table 10: The results of EFA and Reliability Statistics (2 factors solution) (Source: own research)

The analysis resulted in two factors: F1 representing Enterprise HRD systems to support innovation and F2 representing Innovative employee engagement. Several recent studies on HRD and innovation in SMEs show comparable findings. For instance, a study by Al-Ajlouni (2021) examined high-performance work systems (HPWS) and their role in promoting organizational innovation. This research confirmed that employee engagement mediates the relationship between HRD systems and employee creativity, influencing organizational innovation. This aligns with the finding that innovative employee engagement is a key factor in HRD innovation. Another study by Halim et al. (2020) explored how innovative human capital and organizational culture promote innovative performance in SMEs. Their findings emphasize that adopting an innovation culture may encourage new ideas, and innovative behavior by organizational members. In our study, to classify the sampled SMEs, into similar groups the non-hierarchical cluster analysis (K-means) was performed. In our study the division of the SMEs followed the Rogers' theory of diffusion of innovations (Rogers, 1962), according to which the enterprises differ in their approach to the adoption of innovations, which leads to a natural division into groups. Based on this theory, the division of entrepreneurs into three clusters reflects different levels of adoption of innovations in the field of HRD in SMEs. The scores for each factor are shown in Table 11. By the identification of clusters, we can conclude that the results of this analysis showed three types of SMEs with the different level of HRD innovation.

Cluster 1: A negative score in F1 indicates that enterprises in this cluster have weaker HRD systems to support innovation, but they have a positive score in F2, indicating that employees are relatively better engaged in innovation. This cluster may represent enterprises that do not sufficiently support innovation in terms of systems but motivate their employees well (Conservatives).

Cluster 2: A negative score in both factors indicates that companies in this cluster lag in both areas: they do not have strong HRD systems or employee involvement. It is the least innovative cluster (Traditionalists).

Cluster 3: A positive score in both factors shows that companies in this cluster have strong HRD systems and a high level of employee involvement in innovation. This cluster represents the most innovative enterprises. Cluster 3 has the most cases (respondents), indicating that most entrepreneurs score relatively high in innovative HRD systems and employee engagement (Innovation leaders).

	Cluster		
	1	2	3
F1 Enterprise HRD systems to support innovation	-1.15734	-.09384	.75280
F2 Innovative employee engagement.	.50335	-1.21493	.45395
Distribution of respondents	27	28	45

Table 11: Cluster centers value
(Source: own research)

The results obtained through K-means cluster analysis were tested by ANOVA (Table 12). The F-tests should be used only for descriptive purposes because the clusters have been chosen to maximize the differences among cases in different clusters. The observed significance levels are not corrected for this and thus cannot be interpreted as tests of the hypothesis that the cluster means are equal. The clusters differ in each of the factors (based on the results of the F-test).

	Cluster		Error		F	Sig.
	Mean Square	df	Mean Square	df		
F1 Enterprise HRD systems to support innovation	30.957	2	.382	97	80.967	.000
F2 Innovative employee engagement.	28.722	2	.428	97	67.042	.000

The F tests should be used only for descriptive purposes because the clusters have been chosen to maximize the differences among cases in different clusters. The observed significance levels are not corrected for this and thus cannot be interpreted as tests of the hypothesis that the cluster means are equal.

Table 12: ANOVA
(Source: own research)

The differences between clusters in both factors are statistically significant, which means that these clusters really reflect differences in the levels of innovativeness of HRD systems and employee engagement. The study points to the importance of innovative HRD systems, which is in line with studies that emphasize strategic HRM as a key factor in innovative enterprises. According to research by Piwowar-Sulej et a. (2022), HR systems must be flexible and connected to business strategy to effectively support innovation. The findings are also consistent with the literature that emphasizes that engaged employees are critical to the success of innovation strategies. A study by Kwon & Kim (2020) shows that employees who feel involved in innovation contribute to higher flexibility of the company. The link between employee engagement and innovation is also the motivation (Zsigmond et al. 2024).

Table 13 represents the distribution of SMEs into three clusters according to their size category. Cluster 1 is evenly divided between small, medium and larger enterprises. Cluster 2 has slightly more larger enterprises. Cluster 3 has the most medium-sized enterprises, but it is also represented in other size categories. The results showed, that more innovative companies (cluster 3) tend to be medium-sized, which indicates that medium-sized companies may have better conditions for the development of innovations in HRD.

			Size category of SME			Total
			micro	small	medium	
Cluster	1	Count	8	8	11	27
		% of Total	8.0%	8.0%	11.0%	27.0%
	2	Count	7	7	14	28
		% of Total	7.0%	7.0%	14.0%	28.0%
	3	Count	8	19	18	45
		% of Total	8.0%	19.0%	18.0%	45.0%
Total		Count	23	34	43	100
		% of Total	23.0%	34.0%	43.0%	100.0%

Table 13: Distribution of SMEs in three clusters by the size of enterprise (Source: own research)

Table 14 represents the distribution of SMEs into three clusters according to the type of activity, which SMEs carry out. Cluster 1 has more service-oriented enterprises. Cluster 2 has the same number of manufacturing and service businesses. Cluster 3 has significantly more service-oriented enterprises. Higher innovativeness in HRD (cluster 3) is more represented in the service sector. Service businesses may have a greater need and opportunity to engage employees and develop HRD systems to support innovation.

			Type of activity		Total
			production	services	
Cluster	1	Count	8	19	27
		% of Total	8.0%	19.0%	27,0%
	2	Count	13	15	28
		% of Total	13.0%	15.0%	28,0%
	3	Count	13	32	45
		% of Total	13.0%	32.0%	45,0%
Total		Count	34	66	100
		% of Total	34.0%	66.0%	100.0%

Table 14: Distribution of SMEs in three clusters by the type of activities (Source: own research)

Table 15 represents the distribution of SMEs into three clusters according to the type of position in SMEs. In cluster 1, managers and owners are equally represented. Cluster 2 has more managers at the head of the company. Cluster 3 has significantly more managers. Firms with a higher level of innovativeness (cluster 3) have a greater representation of managers, which may indicate that managerial support and leadership are crucial for the introduction of HRD innovations.

Table following on the next page

			Position		Total
			owner	manager	
Cluster	1	Count	15	12	27
		% of Total	15.0%	12.0%	27.0%
	2	Count	10	18	28
		% of Total	10.0%	18.0%	28.0%
	3	Count	17	28	45
		% of Total	17.0%	28.0%	45.0%
Total		Count	42	58	100
		% of Total	42.0%	58.0%	100.0%

Table 15: Distribution of SMEs in three clusters by the type of position (Source: own research)

4. CONCLUSION

The results of the study confirmed the importance of innovative HRD systems in SMEs and their connection with adaptability to innovation. The identification of two key factors, which are corporate HRD systems supporting innovation (F1) and innovative employee engagement (F2), shows that the combination of organizational systems and personnel involvement is crucial for improving the ability of SMEs to innovate. K-means segmentation of enterprises into three clusters provides a deeper insight into the different levels of innovativeness within SMEs and reveals that the most innovative enterprises are in cluster 3 and achieve synergistic effects due to high performance in both factors.

This study highlights the lack of research that addresses differences in the implementation of HRD systems in SMEs across different countries. Future research can examine how geographical and cultural factors influence the success of HRD innovations in individual regions, which is particularly important for international business. the research brings new evidence to support existing theories on HRD innovations and opens up space for further research, especially in the area of international comparison and specific strategies for SMEs.

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MANDATORY PENSION SCHEMES: AN ASSESSMENT WITHIN THE OVERLAPPING GENERATIONS FRAMEWORK

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ABSTRACT

This study assesses the feasibility of two mandatory pension schemes through potential abolition reforms, focusing on Croatia's multi-pillar pension system. Unlike many other European nations that have reformed their pension systems, Croatia presents a distinct case with a multi-pillar pension system largely unchanged for over two decades. Using a three-period overlapping generations general equilibrium (OLG) model that includes the government and a two-tier pension system, the study accurately depicts the three-period life cycle of a representative Croat, who is entitled to an old-age pension at age 65 after 40 years of pensionable service, and who then receives a pension for approximately 20 years. The model allows for a uniform assessment of three reform scenarios. The first reform scenario, a full transition to the second pension pillar, significantly reduces the system's sustainability due to inadequate coverage of first-pillar pensions by contributions during the transition period. Although this reform partially improves consumption and pension adequacy, it results in greater long-term fluctuations. The second reform scenario involves the abolishment of the second pension pillar, essentially reversing the 2002 pension system reform. This reform aims to enhance sustainability and boost economic growth. It yields positive outcomes such as reduced public debt and a narrowed pension gap. However, minor declines in certain economic indicators were observed, and anticipated improvements in pensions and wages were not fully realized. The third scenario presents a smaller parametric reform as an alternative to radical reforms. Reducing overall pension contributions stimulates consumption and private investment, with a milder impact on fiscal sustainability than the first reform scenario.

Keywords: *Croatia, mandatory pension scheme, OLG model, pay-as-you-go, pension funds.*

1. INTRODUCTION

The stability of pension systems and their ability to provide sustainable, long-term support are pivotal economic and political issues for national economies. The consistent rise in pension expenses primarily stems from an aging population, longer life expectancy, and declining birth rates. Emigration of the working-age population exacerbates demographic challenges, leading to a lower ratio of workers to pensioners. Consequently, nations are exploring various pension reforms to improve the fiscal position of the pension system and guarantee adequate incomes for both current and future pensioners. These reforms, however, are often hindered by the requirement for broad political consensus. A central tension in pension reform arises between two conflicting objectives: securing the long-term financial sustainability of pension systems without imposing significant burdens on future generations or reducing benefits, and maintaining pension adequacy, which frequently necessitates increased contributions (Pallares-Miralles et al., 2012). Current policy analyses compare pension systems based on intergenerational solidarity with those relying on capitalized savings to identify optimal financing models.

Although the three-pillar system proposed by the World Bank (1994) aimed to enhance economic and social outcomes, it has not consistently succeeded across various contexts. As a result, reforms often focus on adjustments within the primary pension pillar, such as increasing the retirement age and revising pension formulas (Kasek et al., 2008), rather than more contentious overhauls of the secondary pillar. While many post-communist European nations have implemented substantial pension reforms (Table 1), Croatia stands out as a notable exception, having kept its pension system largely unchanged for over two decades. In 2002, it adopted a three-pillar model, mandating a 5% contribution from employees under 40 to private funds, aiming for financial sustainability and stronger links between contributions and pensions. Despite initial promises of higher pensions for younger generations, the Croatian system has not undergone substantial reform like those in other countries.

Table 1. Importance of the second pension pillar in a chosen set of countries

Country	Year of introduction	Contribution rate (total)	Reform during the financial crisis (2007)	Possibility to opt for/out	Year of abolition
Bulgaria	2002	5% (19.8%)	reduced contributions and extended working life	Mandatory	-
Czechia	2013	(28%)	-	Voluntary	2016
Croatia	2002	5% (20%)	voluntary second-pillar participants allowed to return	Mandatory	-
Hungary	1998	(18.5% all social cont.)	extended working life, changes in the criteria for early retirement	Voluntary	2010
Poland	1999	(19.52%)	reduced contributions, changes in the criteria for early retirement and extended working life	Voluntary	2018
Romania	2008	3.75% (26.3%)	increased total contributions, abolished special pension schemes	Mandatory	-
Slovakia	2005	4.25% (28.75%)	introduction of the option to transfer from the second pillar to the first pillar	Voluntary	2012

Source: Hirose (2011), Batty (2012), Milos, Milos (2012), Fultz and Hirose (2018)

More than two decades after this significant reform, its initial objectives and long-term effectiveness remain uncertain, raising questions about the outcomes achieved. Table 2 outlines the challenges facing the Croatian pension system, which shapes the scope of this research, with data corresponding to 2020 to align with the model discussed later.

Table 2. Challenges and unique features of the Croatian pension system

Demographic challenges
By 2100, the population is projected to decline to 2.8 million (2.3 in a no-migration scenario) according to Eurostat projections (2023)
The dependency ratio is expected to increase from 31% to 61% (70%) during the same period, while fertility rates are not anticipated to change significantly
Economic and social challenges
The paradox of high pension expenditures (10% of GDP) and public debt (73% of GDP) on one hand, and the lowest replacement rates on the other hand (39%)
26% of pensioners are below the poverty risk threshold, with the average pensioner only being 106 euro above the threshold.

The labor force participation rate for the population aged 15-64 is 67%, while for those aged 65 and older, it is only 6%	
First pension pillar	Second pension pillar
The ratio of pensioners to workers is 1:1.24	Unmet conditions for reform and reform objectives
The pension gap amounting to around 2.4 billion euros	Transition cost close to the value of the assets of mandatory pension funds
Only 47% of pension beneficiaries are recipients of old-age pensions	Assets of mandatory pension funds amounting to 16 billion euros or 30% of Croatia's GDP
15 out of 18 categories of privileged pensions have a higher average pension than the average pensioner	Between 60% and 80% of the funds invested in government bonds
As many as 24 categories of individuals eligible to inherit a family pension	

Source: authors according to Eurostat (2023) Croatian Bureau of Statistics (DZS) (2023) and Croatian Pension Insurance Institute (HZMO) (2023)

This study aims to examine two opposing radical reforms: a complete transition to an individual capitalized savings scheme (abolishing the first pension pillar) and the elimination of the mandatory individual capitalized savings scheme (the second pillar). Additionally, a third reform explores the effects of reducing overall contributions on the economy. Utilizing the Overlapping Generations (OLG) framework, the study provides a uniform evaluation of the implications of each reform for the Croatian economy, differing from traditional econometric methods. The paper is organized into five sections: Section 2 establishes the theoretical foundation of the OLG model, including three-generational households and the pension system; Section 3 outlines the empirical structure, detailing parameter selection and calibration; Section 4 presents the results; and Section 5 concludes with a summary of findings.

2. THE MODEL

The analytical framework consists of an overlapping generations (OLG) general equilibrium model for studying the impacts of population aging and intergenerational transfer mechanisms in social security systems. The model prioritizes optimal intertemporal behavior, accommodating both finite (OLG models) and infinite life spans (Ramsey, 1928; Solow, 1956). Heterogeneity among individuals is a key consideration, making OLG models the preferred type for this research. Built on the theoretical foundation of life cycle theory, the model, inspired by Diamond's (1965) OLG model with aggregate production, incorporates elements from Allais (1947) and Samuelson (1958). It encompasses a government sector with tax revenues and debt. Additional features are outlined to adapt the model for empirical modeling of the Croatian pension system, with a focus on the unique characteristics of the capitalized savings and generational solidarity systems.

2.1. The Household Sector

The initial step in developing OLG models involves modeling individual and producer behavior based on microeconomic theory. The basic two-generational life cycle OLG model assumes individuals live only two periods: young and working, then old and retired. Each new period starts with a new generation, and the previous young generation transitions into old age before passing away. Despite finite lifespans, the economy persists. This model is akin to Diamond's (1965) neoclassical OLG model but has limitations in practical implications. Considering the limitations of the two-period theoretical framework (Auerbach and Kotlikoff, 1987; Simonovits, 2003) and aiming for a more detailed depiction of individual life cycles, the OLG model is expanded to include three generations. Introducing a population sector with three adult generations aligns with the work-life structure in Croatia, where an individual starts working at

25, becomes eligible for old-age retirement at 65, with 40 years of pension contributions, and receives a pension for approximately 20 years. Before modeling, it is necessary to define several mathematical sets for generations and time periods. Three generations are categorized in the set $G = \{g_1, g_2, g_3\}$. Working generations, $\{g_1, g_2\}$, are within subset GJ, where the younger generation in set GI represents the initial generation. The retired $\{g_3\}$ exists in sets GM and GN, symbolizing the non-working and last generation. The total time horizon, $TTP = \{t_1, t_2, t_3, \dots t_{15}\}$, involves $TP = \{t_1, t_2\}$ not used in modeling, as it marks the birth of generations t_3, g_2, and t_3, g_3, assuming equilibrium during this time. $TI = \{t_3\}$ represents the initial period, while $T = \{t_3, \dots t_{15}\}$ includes all periods in the model's estimation. Modeling starts in 2020 (t_3), divided into three age groups: 25-44 years, 45-64 years, and 65-84 years, each lasting 20 years[1]. Population trends rely on Eurostat's projections (2023) until 2100 and extend until 2260 (t_{15}), primarily for computational purposes. There are no significant changes modeled post-2100. Understanding cohort changes is crucial, and the demographic structure depicted in Appendix 1 validates the use of this macroeconomic model to highlight fiscal challenges resulting from demographic shifts. The model's demographic structure closely relates to consumer behavior, explained below. In a three-generation model, the present value of the intertemporal budget constraint is derived as:

$$0 = \frac{-C_{t5,g3}}{Ri_{t5}Ri_{t4}Ri_{t3}} + \frac{(w_{t4,g2} - C_{t4,g2})}{Ri_{t4}Ri_{t3}} + \frac{(w_{t3,g1} - C_{t3,g1})}{Ri_{t3}}, \tag{1}$$

where $C_{t,g}$ is consumption, $w_{t,g}$ wage, i_t interest rate and $Ri_t = i_t + 1$ (Mérette and Georges, 2010).

Utility functions in pension system models are carefully chosen based on preferences and objectives. The Cobb-Douglas and logarithmic functions have limitations, as they lack time separability and fail to link savings to interest rates, respectively (Cipriani, 2014; Thøgersen, 2015). CES and CRRA functions are employed in various studies to assess asset accumulation and observe changes in individual savings due to pension reforms, so the CRRA function with three generations has the following form:

$$U = \frac{(C_{t3,g1})^{1-\theta}}{(1-\theta)(1+\beta)} + \frac{(C_{t4,g2})^{1-\theta}}{(1-\theta)(1+\beta)^2} + \frac{(C_{t5,g3})^{1-\theta}}{(1-\theta)(1+\beta)^3}, \tag{2}$$

where $\theta = 1/\sigma$ is the inverse of the elasticity of intertemporal substitution and β the rate of time preference (Mérette and Georges, 2010). The utility of each generation in each period will be assessed across all modeled reform scenarios and trends will be interpreted as either an increase or a decrease in welfare. Necessary conditions in optimization are:

$$\begin{aligned} \frac{C_{t4,g2}}{C_{t3,g1}} &= \left(\frac{Ri_{t4}}{1+\beta}\right)^{\frac{1}{\theta}} \\ \frac{C_{t5,g3}}{C_{t4,g2}} &= \left(\frac{Ri_{t5}}{1+\beta}\right)^{\frac{1}{\theta}}. \end{aligned} \tag{3}$$

[1] The delineation excluding individuals under 24 years not in employment and those over 85 years is crucial within the empirical OLG model to establish an upper boundary for the final cohort.

From these, it is possible to obtain consumption amounts for each period. Individual incomes are derived from a function related to labor supply and a particular earning profile based on age (Hviding and Mérette, 1998; Mérette and Georges, 2010; Hsu, 2017). The specific earnings profile (EP_g) is represented by a quadratic function:

$$EP_g = \omega + \xi * (k+1) - \varphi * (k+1)^2. \tag{4}$$

The parameters ω and ξ are adjusted to the real earning profile of the Croatian workforce concerning age, where $k = 0, 1, 2$. Labor supply is determined when establishing market equilibrium.

2.2. The Production Sector

The representative firm's modeling is simplified in the pension system analysis, following the approach of numerous similar studies (e.g., Değer, 2008; Yi, 2008; Georges et al., 2016; Tyrowicz et al., 2018; Börsch-Supan et al., 2018; Härtl, 2019). It maintains the Diamond's (1965) theoretical framework, with the firm employing Cobb-Douglas technology to produce a single good (numeraire, P=1):

$$Q_t = A_t(Kd_t)^{\alpha}(Ld_t)^{1-\alpha}, \tag{5}$$

where α is capital income share, $1-\alpha$ labor income share, A total factor productivity, Kd_t demand for capital, and Ld_t labor demand (Mérette and Georges, 2010; Bielecki et al., 2015; Tyrowicz et al., 2018). Profit maximization, outlined by equation:

$$\pi_t = P * Q_t - (i_t Kd_t + w_t Ld_t), \tag{6}$$

and Lagrange's function, simplifies the problem to unconstrained profit maximization, governed by standard conditions for optimal factor combinations (Stepanek, 2019), expressed in equation:

$$\begin{aligned} Kd_t &= \frac{\alpha P Q_t}{i_t} \\ Ld_t &= \frac{(1-\alpha) P Q_t}{w_t}. \end{aligned} \tag{7}$$

When introducing the depreciation rate δ, the rent r_t and interest rate i_t differ and rent exceeds the interest rate to compensate the owner for capital depreciation. Otherwise, individuals would prefer to invest their savings in financial assets that do not lose value (Georges et al., 2016; Härtl, 2019). The physical capital stock constitutes a part of the total assets in the economy, which amounts to periods t and $t-1$ equals:

$$\begin{aligned} Ks_{t3} &= N_{t3,g1}S_{t3,g1} + N_{t3,g2}S_{t3,g2} + N_{t3,g3}S_{t3,g3}, \\ Ks_{t4} &= N_{t4,g1}S_{t4,g1} + N_{t4,g2}S_{t4,g2} + N_{t4,g3}S_{t4,g3}, \end{aligned} \tag{8}$$

where Ks_t is supply of capital, dependent on the size of the cohorts ($N_{t,g}$) and their savings ($S_{t,g}$). In a closed economy, investments are equivalent to national savings.

The relationship between the capital stock (assets) and gross private investments I_t, which are a component of aggregate demand, is then expressed as:

$$Ks_{t4} = I_{t3} + (1 - \delta) * Ks_{t3}. \tag{9}$$

As the supply side is greatly simplified in the model, the introduction of the state will not affect the displayed behavior of the firm but will significantly alter the demand side of the model. However, incorporating the foreign sector will also change the relationship between aggregate supply and demand and the ratio between aggregate savings and investments.

2.3. Government and the Foreign Sector

OLG models effectively simulate various life cycle segments - education, employment, retirement—making them suitable for analyzing intergenerational transfers (de la Croix and Michel, 2002). Evaluating economic policies within this framework requires incorporating state actions, including taxes and non-age-dependent government spending, alongside budget constraints, fiscal deficits, and public debt. The introduction of tax rates alters budget constraints and Euler's conditions, influencing market equilibrium through government demand for goods and government bonds. Consequently, the consumer's budget constraint must be adjusted to reflect revenues from income, value-added, and corporate taxes, while excluding inheritance and gift taxes. The lifetime budget constraint with taxes on consumption (τ_C), labor (τ_w) and capital (τ_K), tailored to the three-generation model, results in:

$$\frac{\sum_{k=0}^{k=3}\{(1+\tau_{C_{t+k}})C_{t+k,g+k}\}}{\prod_{T=t}^{t+k}[1+(1-\tau_{K_T})i_T]} = \frac{\sum_{k=0}^{k=3}\{(1-\tau_{w_{t+k}})p_{t+k} * ls * EP_{g+k}\}}{\prod_{T=t}^{t+k}[1+(1-\tau_{K_T})i_T]}. \tag{10}$$

The fiscal model employs tax revenues for public spending, particularly pensions, with endogenous variables determined by the chosen fiscal closure method, influenced by tractability and research goals. Gilbert and Tower (2012) suggest adjusting either the revenue or expenditure side for simulated reforms. In an open economy with fixed government spending and tax rates, the model calculates the budget deficit, making savings endogenous and facilitating analysis of investment and public spending changes, including pensions.

Additionally, OLG models must incorporate fiscal rules that limit fiscal variables to enhance discipline and prevent public debt surges (Johnson, 2001). Johnson's simulations show that constant tax rates yield smoother consumption paths, while Makarski et al. (2017) argue that financing pension reforms through borrowing improves intergenerational resource distribution. In the empirical OLG model, tax rate changes are not allowed; instead, public debt growth is used for pension reform modeling. The model also represents a small open economy, aligning domestic interest rates and input prices with global rates, which improves the depiction of aggregate demand relationships and alters equilibrium conditions in the final goods market. Consequently, the GDP Q_t equals:

$$Q_t = \sum_g N_{t,g} C_{t,g} + I_t + G_t + Ex_t - Im_t, \tag{11}$$

where Ex_t are exports, Im_t imports, and their difference, net exports, which will be considered the current account of the balance of payments, as its most crucial part. Given that flows of goods must equate to capital flows, the current account must correspond to the capital and financial account of the balance of payments CA_t thus, a negative net export increases debt.

However, as the determinants of net exports are not explicitly modeled, the capital and financial account is derived using the following relationship:

$$CA_t = \left(\sum_g N_{t+1,g+1} S_{t+1,g+1} - \sum_g N_{t,g+1} S_{t,g+1} \right) - (Ks_{t+1} - Ks_t), \quad (12)$$

where the first part refers to domestic savings, while the second part denotes domestic investments (Mérette and Georges, 2010). Since the savings-investment equality does not hold in the model, it's important to clarify the components of aggregate savings. Here, $S_{t,g}$ represents household savings, while government and foreign savings are determined within the social accounting matrix based on the relationship between government revenues and expenditures and foreign trade. Additionally, the model excludes the exchange rate variable, as approximately 70% of Croatia's trade is conducted with EU nations, primarily in euros, especially with the euro becoming the official currency in the early years of the model period (2020-2040).

2.4. Pension System

In general, there are two types of pension schemes: the individual capitalized savings system involves contributions from an individual from the younger cohort in period t invested and returned with interest in period $t + 1$ to the same individual, while in the generational solidarity system, contributions from the young in time t fund pensions for older contemporaries (de la Croix and Michel, 2002). Pension calculation equations adhere closely to the Croatian Pension Insurance Act, considering the model's constraints. In Croatia, pensions from the first pillar are calculated using pension points, similar to the system in Germany. These pensions depend on the retirement age, qualifying years, the insured person's income relative to the average income, changes in average gross income, and the consumer price index rate in Croatia[2]. Given the homogeneity of the pensioners in this study - retiring at age 65 with an average wage and living until age 84 - factors like personal points, pension factors, and supplements are excluded from the calculation. In this simplified model, where firms produce a single product priced at 1, pensions are aligned with changes in average gross wages and estimated via the replacement rate. The formula used for first pillar pensions is as follows:

$$m_1 = \varrho * p * w, \quad (13)$$

where m_1 is first pillar pension, ϱ is the replacement rate, and p rate of gross wage growth. Ludwig (2005) uses a similar formula for the German, French, and Italian pension systems. Calculating pensions from the individual capitalized savings scheme differs from the first-pillar method, relying on factors such as the second pension pillar contribution rate, annual gross wage, qualifying years, wage growth rate, pension fund returns, and the discount rate set by the pension company. While pension adjustments for the second pillar follow a similar approach to the first pillar (Bakić, 2007; Milić, 2019), mortality tables[3] cannot be included due to model constraints. Consequently, the formula used for pensions from the second pillar is as follows:

$$m_2 = d_2 * p * w, \quad (14)$$

where m_2 is second pillar pension and d_2 second pillar contribution rate.

[2] A detailed description of the methodology is available in the Pension Insurance Act, Bakić (2007), and Milić (2019).

[3] The methodology for second pillar pensions is outlined in the same sources as for first pillar pensions.

Comparing the final pension formulas for the first and second pillars, the first pillar operates as a variant of the Defined Benefit system, while the second pillar functions as a Defined Contribution system. The total pension m is the sum of pensions:

$$m = m_1 + m_2. \tag{15}$$

With the introduction of pensions, the amended fiscal constraint considering tax rates and pensions for an individual born and working in period t_3 is now:

$$\begin{aligned}(1 + \tau_{C\,t3})C_{t3,g1} + S_{t4,g2} - S_{t3,g1} \\ = (1 - \tau_{w\,t3} - d_1 - d_2)w_{t3,g1} + (1 - \tau_{K\,t3})i_{t3} * S_{t3,g1},\end{aligned} \tag{16}$$

while the 'income' of the retired cohort is no longer zero but is now equal to (15), as seen from the optimization problem:

$$U = \frac{(C_{t3,g1})^{1-\theta}}{(1-\theta)(1+\beta)} + \frac{(C_{t4,g2})^{1-\theta}}{(1-\theta)(1+\beta)^2} + \frac{(C_{t5,g3})^{1-\theta}}{(1-\theta)(1+\beta)^3}, \tag{17}$$

with the constraint:

$$0 = \frac{-C_{t5,g3} + m_{t5,g3}}{Ri_{t5}Ri_{t4}Ri_{t3}} + \frac{w_{t4,g2} - C_{t4,g2}}{Ri_{t4}Ri_{t3}} + \frac{w_{t3,g1} - C_{t3,g1}}{Ri_{t3}}. \tag{18}$$

Finally, at the state level, the fiscal constraint is defined as:

$$\begin{aligned}B_{t+1} + \sum_g N_{t,g}\left[\tau_{w\,t}(w_{t,g}) + \tau_{C\,t}(C_{t,g}) + \tau_{K\,t}(i_t S_{t,g})\right] + D_t \\ = M_t + G_t + Ri_{t-1}B_t,\end{aligned} \tag{19}$$

where B_t represents public debt, G_t government spending, D_t represents contributions to the first pension pillar, M_t denotes expenditures for pensions from the first pillar, and their difference represents the pension gap calculated as follows:

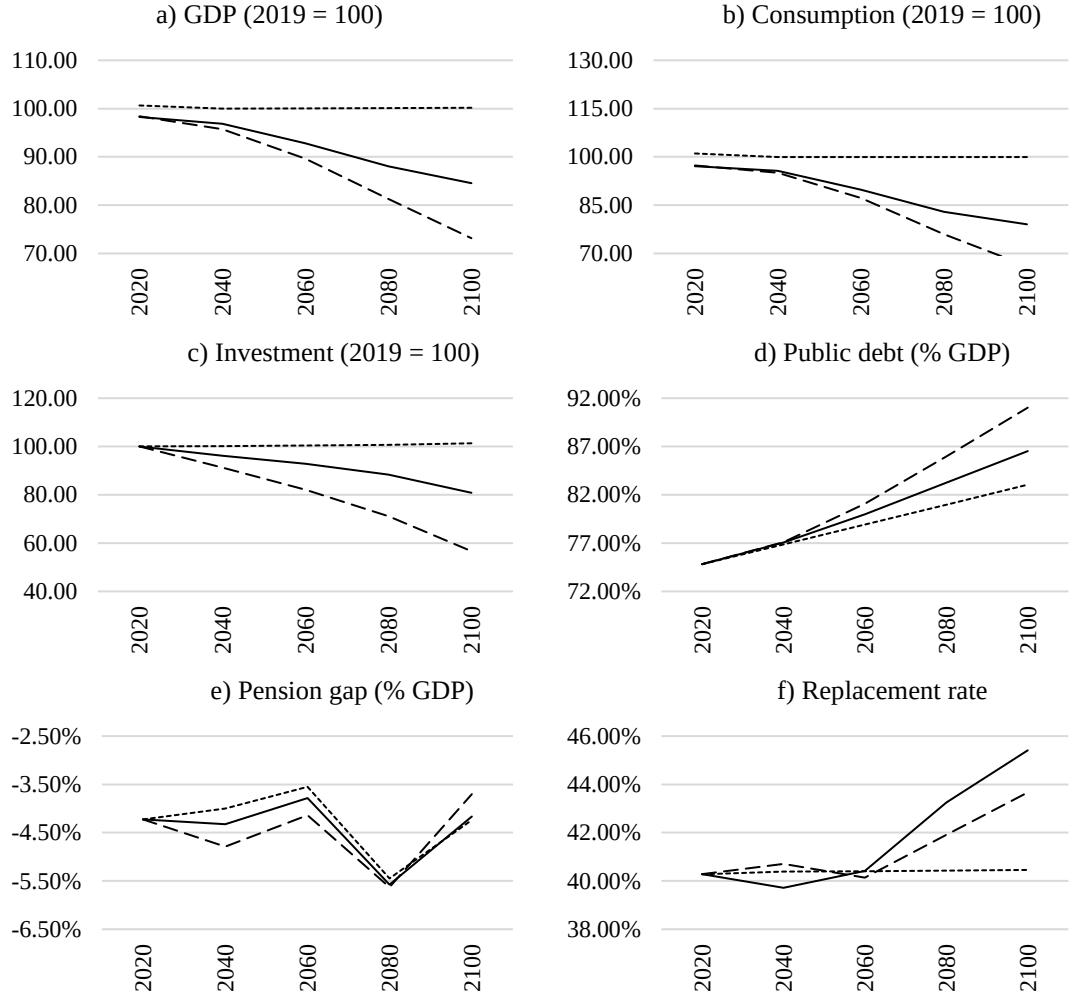
$$D_t - M_t = \sum_{gj} N_{t,g}\left[d_{1,t} * p_t * w_{t,g}\right] - \sum_{gm} N_{t,g}\left[\varrho_t * p_t * w_{t,g2}\right]. \tag{20}$$

3. SIMULATION RESULTS

To adapt the theoretical framework to Croatia's economy, the first step involves identifying key parameter values that reflect its unique characteristics and pension system. Then, a Social Accounting Matrix (SAM) is built as the foundation for analysis in Computable General Equilibrium (CGE) models. The model is parameterized to align with Croatian economic behavior, using both literature estimates and calibration. To ensure accuracy, effective tax rates are used instead of legal ones due to unrealistic gross-to-net wage ratios. The SAM, based on calibrated parameters, tracks the flow of goods and services among sectors in a small open economy. As Croatia's 2010 input-output tables are outdated, SAM values are computed using 2019 as the baseline year, with GDP shares normalized. Calibration, popular in policy analysis, follows Cooley (1997), with Kydland and Prescott (1982) and Shoven and Whalley (1984) pioneering its use in CGE models. In Croatia, Adelman and Šohinger (2000) first applied this model, with further studies by Škare and Stjepanović (2013) and others.

The benchmark model is calibrated to Croatia's economy, reflecting key aggregates and consumer lifecycles, with parameter details in Pavković (2021). The empirical analysis compares the proposed reforms using a computational OLG model, beginning with a benchmark scenario outlining Croatia's economic state and future projections up to 2100. This analysis examines three demographic scenarios: one assuming zero population growth, another based on Eurostat's (2023) baseline projection for Croatia from 2020 to 2100, and a third eliminating migration, leading to significant labor market shifts. Differences between these scenarios arise from changes in the labor force and foreign worker inflows. The model also accounts for shifts in age structure, a critical aspect in OLG models, with detailed projections and time structure outlined in Pavković (2021).

Figure 1. Benchmark OLG model



Source: Authors / Note: Due to overestimation of pension contributions, the increase in public debt in later periods is underestimated in both the benchmark model and reform scenarios. A dotted line represents the stationary population demographic scenario, a continuous line illustrates the baseline projection, and a long-dashed line represents the scenario without migration.

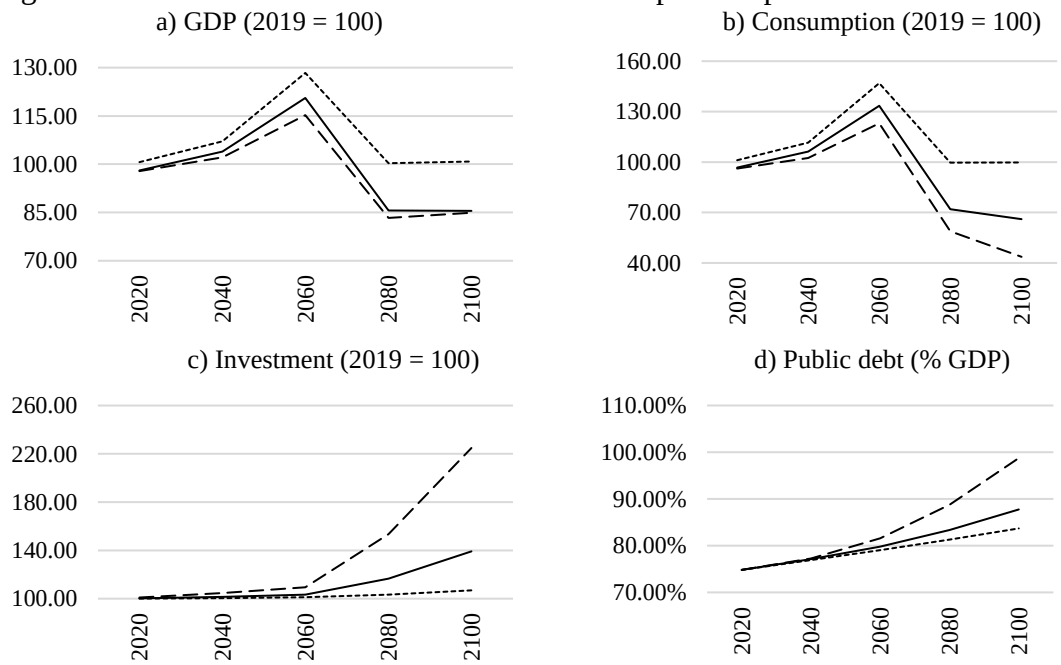
Changes in the benchmark model stem solely from demographic shifts, while reform scenarios involve adjusting one or two parameters at most. By 2100, the workforce is expected to halve, resulting in increased public debt due to fewer taxpayers and contributors to the pension system.

The model assumes uniformity among pensioners, as all receive old-age pensions, which leads to an overestimation of contributions and an underestimation of debt, since early retirees, disabled individuals, and those with privileged pensions do not contribute for the full 40 years. Given the anticipated adverse effects of population aging, it is crucial to implement reforms in systems most sensitive to demographic changes. While adjustments typically occur within the first pension pillar, the expected depopulation in Croatia prompts consideration of two significant structural reforms.[4]

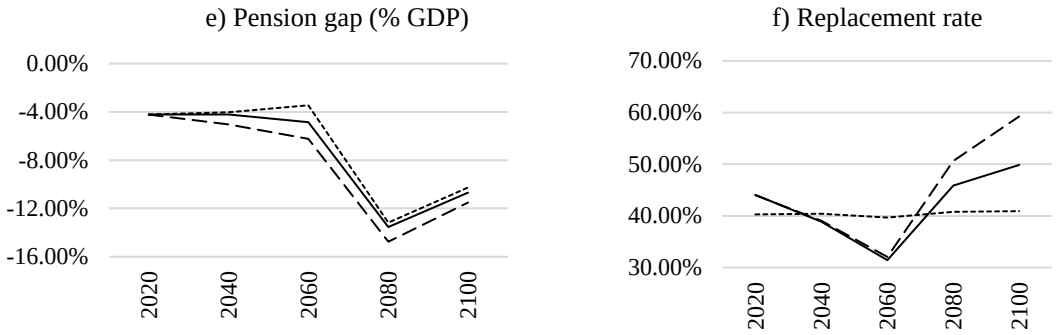
3.1. Full Transition to Individual Capitalized Savings

The first reform involves gradually increasing the significance of the second pension pillar at the expense of the first, eventually transitioning to individual capitalized savings. This shift is expected to deteriorate fiscal sustainability, as pensions from the first pillar must still be funded for existing pensioners, even as contributions to it end. The transition accelerates public debt growth and widens the gap between contributions and pension spending, as illustrated in Figure 2. The reform begins with a 10% allocation of gross wages to each pillar, with effects becoming apparent only after 2040. Subsequently, an additional 5% is directed to mandatory pension funds, establishing a 15% to 5% ratio favoring the second pillar, ultimately phasing out the first pillar by 2080. This gradual shift highlights the implications of increased pension capitalization, allowing for a distinct assessment of its effects in light of demographic impacts.

Figure 2. Effects of the full transition to the second pension pillar



[4] Please note that effects of the reforms are assessed in comparison to the patterns observed in the benchmark model.



Source: Authors

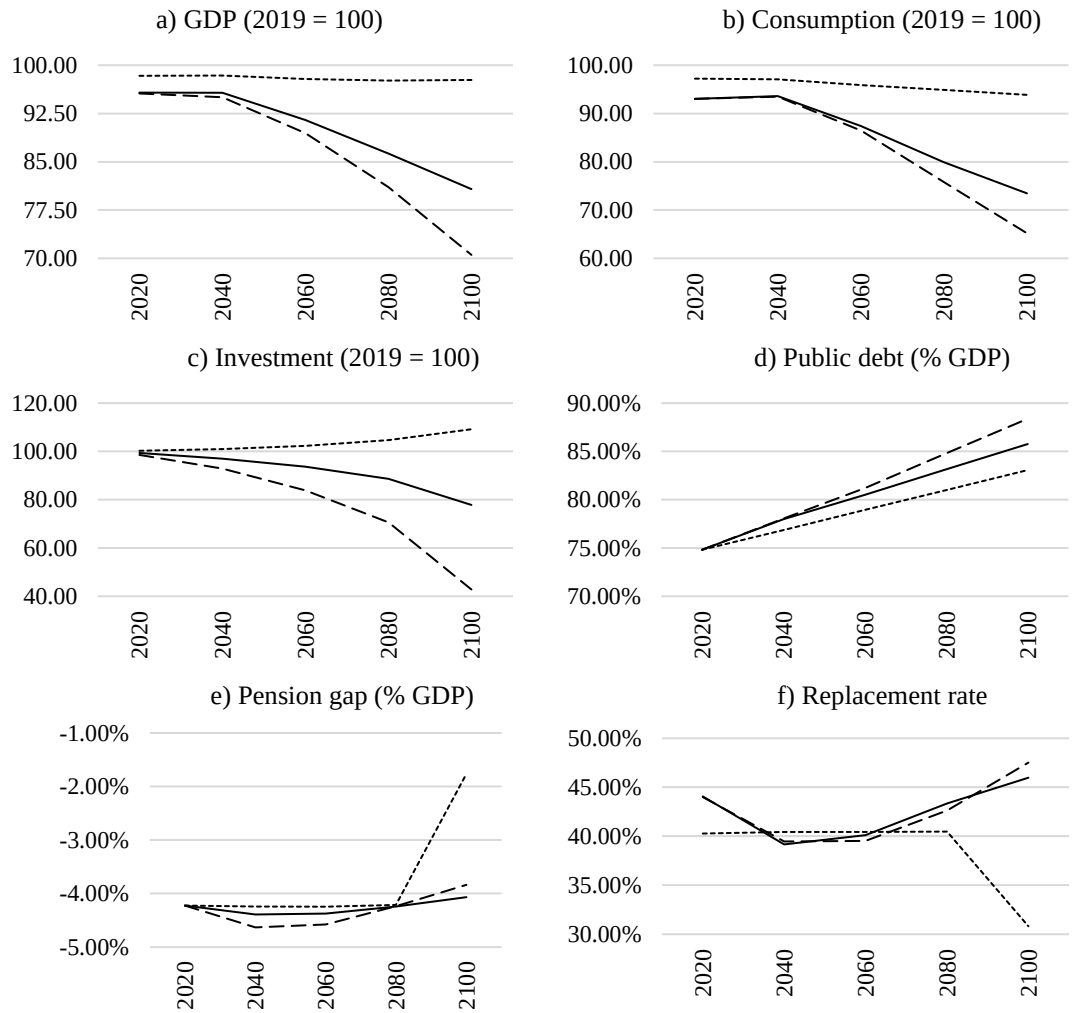
The first reform involved a gradual transition to the second pension pillar, anticipated to negatively impact Croatia's fiscal position - specifically the pension gap, deficit, and public debt. Research confirmed these effects, highlighting a decline in system sustainability as "promised" pensions from the first pillar became less covered by contributions. The transitional phase necessitated financing through borrowing. However, the reform also yielded positive outcomes, such as increased capital accumulation, higher savings, and lowered interest rates, with sustained growth in private investments despite population aging. GDP growth rates were higher in scenarios of stationary population and depopulation compared to a benchmark model without reforms. While short- to medium-term impacts on consumption and pension adequacy were positive, long-term effects were cyclically fluctuating. Overall, the welfare impact was positive, particularly benefiting younger generations entering the workforce. These findings support Yi's (2008) conclusions on China's economy, emphasizing how greater pension capitalization drives economic growth for younger generations. Necula and Radu (2011) advocate for capitalizing pensions as a significant improvement over single-pillar systems, suggesting it be combined with an increased retirement age for better debt management flexibility. Similar views were shared by Davoine et al. (2015), who stressed delaying retirement and the potential role of capitalized savings in domestic investments. Milić (2019) demonstrated that altering contribution distribution can significantly enhance pension benefits without further burdening contributors, corroborated by Werding and Primorac (2018) and Tomaš (2020). Conversely, Altiparmakov and Nedeljković (2018) found no correlation between pension capitalization and higher economic growth in Latin America and Europe, while Been et al. (2016) noted that greater reliance on the second pillar correlates with increased income inequality and poverty among older individuals, warranting further investigation.

3.2. The Abolition of Mandatory Funded Pensions

The second reform was a reverse reform, abolishing the second pension pillar. Figure 3 shows the impacts of this simulated reform. Initially, 16% of gross wages are allocated to the first pillar and 4% to the second. Over time, this proportion shifts to 17% for the first and 3% for the second pillar until the mandatory second pillar is abolished in 2100. While this reversal negates the 2002 reform, it does not simulate the return of assets from mandatory pension funds, which continue without obligatory contributions from workers.

Figure following on the next page

Figure 3. Effects of the full transition to the first pension pillar



Source: Authors

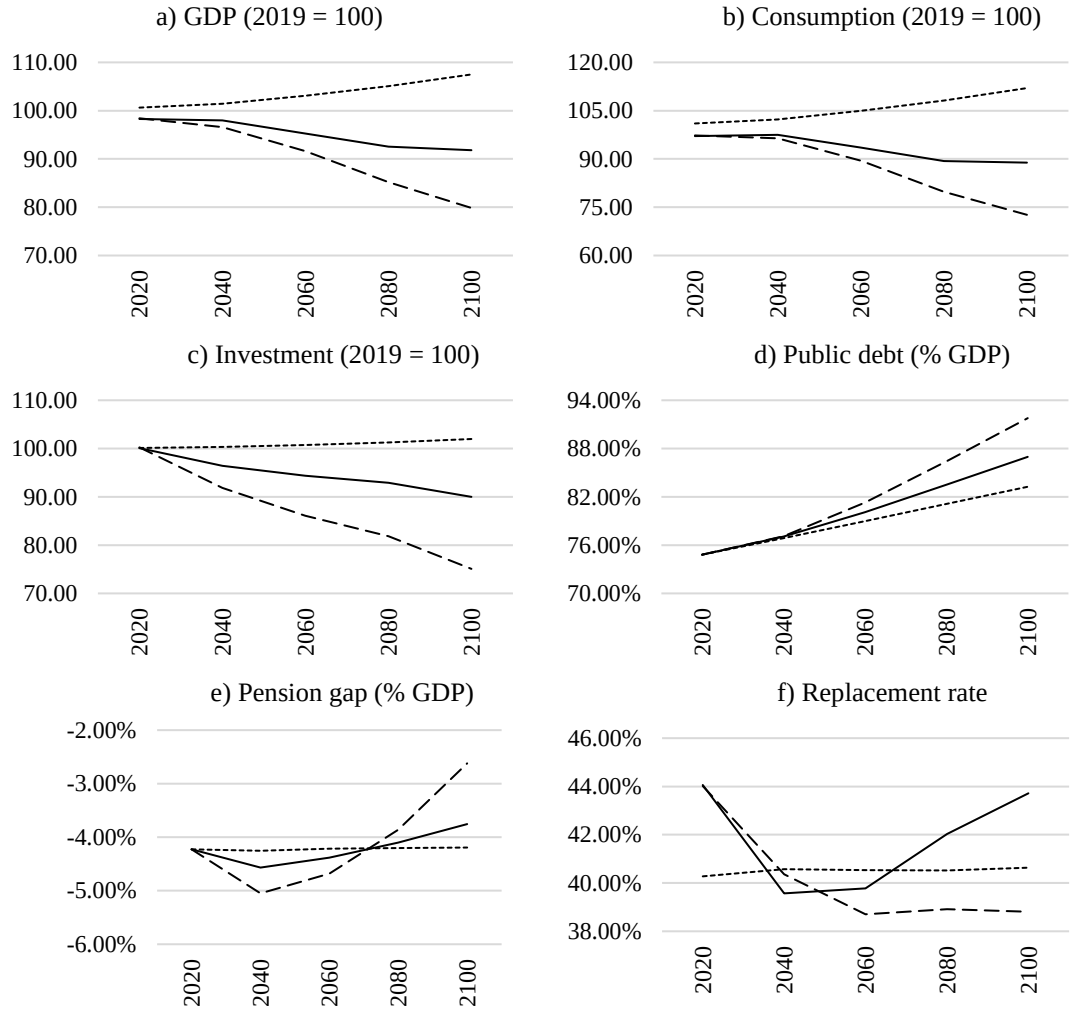
Unlike the first reform, several experts have long advocated for the second proposed reform. They advocate for abolishing the mandatory second pension pillar, arguing it corrects the mistake of its premature introduction and promotes GDP growth, reduces deficits, lowers borrowing, and increases pensions (e.g. Samodol, 2020). Although the benchmark model predicts a slight GDP decline due to reduced personal consumption among the oldest cohort, the reform's positive effects on fiscal sustainability emerge by 2040, nearly closing the pension gap and aligning contributions with expenditures by 2100. Future research could explore returning pension fund assets to the budget or the impact of contributions. The proposed reform significantly enhances pension system sustainability, halving public debt as a percentage of GDP compared to a no-reform scenario. By directing all future contributions to the first pillar, it closes the gap between contributions and expenditures, eliminating the need for government borrowing for pensions. However, while reverting to the first pillar improves fiscal sustainability, it does not achieve economic growth in depopulation scenarios and negatively impacts wage growth. The effects on pension adequacy and interest rates remain unclear. Égert (2012) notes that reverting to the first pillar enhances sustainability in Poland but reduces replacement rates amidst declining wages, a trend observed in Croatia by the World Bank (2019).

Overlooking the benefits of capitalized pensions on capital accumulation and GDP growth, as noted by Börsch-Supan et al. (2006), Shimasawa (2007), Yi (2008), and Stepanek (2019), results in only partial support for the second reform, warranting further investigation into the implications of reduced public debt on investment ratings and interest payments.

3.3. Decreasing the Contributions to the Mandatory Funded Pensions

To assess the impact of mandatory pension contributions, a reform is proposed that gradually reduces contributions by 1 percentage point in each pillar, eventually allocating 10% to the first pillar and eliminating mandatory contributions to the second pillar after five periods. This reduction could enhance household spending and stimulate gross private investments, fostering economic competitiveness and reducing informal labor. Figure 4 illustrates the changes in personal consumption and gross private investments over time, influenced by demographic shifts and reduced contributions. The reform leads to a notable increase in personal consumption, particularly among the youngest cohort, and boosts gross private investments due to lower interest rates, positively affecting wages through capital growth.

Figure 4. Effects of reducing overall pension contributions



Source: Authors

A significant wage relief of two percentage points in each period boosts personal consumption and gross private investments across all demographic scenarios compared to the benchmark model. However, the impact on fiscal sustainability remains uncertain.

This reform unexpectedly reduces the pension gap in the no-migration scenario due to lower pension spending and higher contributions. Figure 4 shows minimal growth in public debt, but reduced pension capitalization limits private investment growth, negatively impacting current pensioners while benefiting future generations with higher wages. The adequacy is affected by a drop in the replacement rate from reduced second pillar pensions, although first pillar pension calculations remain unchanged.

4. CONCLUSION

Croatia presents a unique case among post-communist European nations, having maintained a largely unchanged multi-pillar pension system for over two decades. This study utilizes a three-period Overlapping Generations (OLG) model to evaluate two reform scenarios: a complete transition to fully funded pensions and a pay-as-you-go system. The benchmark OLG model reflects the state of the Croatian economy and projects key economic variables without reforms, examining three demographic scenarios: a stationary population, Eurostat's (2023) depopulation projection, and a scenario without migration. The first reform, a full transition to the second pension pillar, significantly undermines the system's sustainability, as pensions from the first pillar become less covered by contributions during the transition. While this reform shows some positive effects on consumption and pension adequacy, it ultimately leads to greater fluctuations in the long term. The second reform, which involves abolishing mandatory participation in the second pillar, aims to enhance sustainability and stimulate economic growth. Although it successfully reduces public debt and addresses the pension gap, it fails to deliver the expected improvements in pensions and wages, with minor declines in certain economic indicators. Additionally, a smaller parametric reform was explored, focusing on reducing allocations for both pension pillars to boost personal consumption and welfare in the short to medium term. While this approach results in less sustainability loss compared to the first reform, it does not significantly increase investments or capital accumulation to counteract negative demographic trends. The study acknowledges theoretical and empirical limitations inherent in the OLG model, such as its simplifications and constraints in data availability. Recommendations for future research include refining the model's time structure, raising the retirement age, and incorporating the financial sector to analyze the impact of government bonds on pension benefits. Despite its limitations, the OLG model provides valuable insights that could inform future pension reforms in Croatia.

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MULTILEVEL AND MULTIFACETED: THE EFFECTIVENESS OF TRANSFORMATIONAL LEADERSHIP

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ABSTRACT

Ever-present processes of change and development on the individual, organizational, and societal levels require effective transformational leadership. The validity of the construct of transformational leadership in predicting effectiveness has been confirmed in different settings, sectors, and cultures. The aim of this paper was to reveal the intellectual and conceptual structure of research on the effectiveness of transformational leadership. Science mapping of the field was conducted using three bibliometric techniques: co-citation analysis, bibliographic coupling, and co-word analysis. Based on articles from the Web of Science Core Collection database published from 2014 to 2024, we provided a systematic bibliometric review of research in the last decade. This study contributes to the leadership literature by offering insights that advance understanding of the multilevel and multifaceted effectiveness of transformational leadership. The results of bibliometric analyses reveal that the multilevel effectiveness of transformational leadership is reflected in its outcomes on the level of leader, follower, team, and organization. The variety of transformational leadership outcomes that contribute to its effectiveness and the augmentation effect related to the improvement of transactional leadership effectiveness indicate the multifaceted effectiveness of transformational leadership. This paper has practical implications for leaders, human resources managers, and leadership development specialists. Research findings could raise practitioners' awareness of the importance of transformational leadership and inspire its development and demonstration to enhance the effectiveness at multiple levels and in multiple areas. To address the identified knowledge gaps, future research could be directed at examining the intercultural effectiveness of transformational leadership and its effectiveness in connection with sustainability and well-being as particularly important themes in contemporary organizational leadership.

Keywords: *bibliometric analysis, effectiveness, review, transformational leadership*

1. INTRODUCTION

The increasing complexity of business and work environments is a reflection of constant change and development on the individual, organizational, and societal levels. Such ever-present processes require transformational leadership. This approach to leadership has been of particular importance in the last decade marked by the digital transformation that fundamentally changes businesses, industries, and societies (Gong & Ribiere, 2021). The growing demands of multiple stakeholder groups related to the creation of positive social and environmental outcomes will continue to place the initiation and implementation of transformations at the heart of organizational leadership. Transformational leadership was defined by Bass (1985) as the process of raising the followers' awareness of significant issues, evoking their higher-level development needs and commitment to the group's or organization's objectives and purpose, and inspiring them to perform beyond the initial expectations. As a multidimensional construct, Bass's transformational leadership consists of the following dimensions: idealized influence, inspirational motivation, intellectual stimulation, and individualized consideration (Bass, 1985; Bass & Avolio, 1994). Idealized influence refers to role modeling, creating a sense of shared purpose within the group or organization (Bass, 1996), evoking the needs in followers to contribute to the enhancement of effectiveness at all levels (Bass & Avolio, 1994), and risk taking to accomplish these intended outcomes. Inspirational motivation implies articulating an appealing vision (Bass, 1996), evoking enthusiasm and optimism through clear communication (Bass & Riggio, 2006), and expressing confidence that the purpose will be fulfilled (Antonakis, 2012). Advancing the followers'

metacognitive and cognitive processes to question values, beliefs, approaches and behaviors and to find innovative solutions for complex problems is central to intellectual stimulation (Bass & Riggio, 2006). Finally, individualized consideration is related to diagnosing followers' needs, adapting approaches, coaching and mentoring, providing socio-emotional support, and developing followers to their potential (Bass & Riggio, 2006). Previous literature reviews indicated that transformational leadership has been one of the most researched leadership constructs over the last nearly four decades (Dinh et al., 2014; Gardner et al., 2010; Gardner et al., 2020; Lowe & Gardner, 2000). The evolving nature of both leadership and followership in increasingly complex environments could be one of the reasons why the transformational leadership construct has attracted such an interest (Bass & Riggio, 2006). In addition, the outcomes of transformational leadership can be researched at all levels (individual, group, organizational) and across all sectors (private, public, nonprofit). Apart from the formal and direct influence, both formal and informal transformational leadership can also have an indirect horizontal, upward and downward influence on others through role modeling and leading by example in demonstrating inspiring values and behaviors (Bass & Avolio, 1994). Empirical studies indicated the one-way augmentation effect of transformational leadership, which means that "measures of transformational leadership add to measures of transactional leadership in predicting outcomes, but not vice versa" (Bass, 1996, p. 747). Therefore, transformational leadership behaviors can enhance the effectiveness of transaction-based relationships. The validity of transformational leadership in predicting multilevel and multifaceted effectiveness has been confirmed in different settings, sectors, and cultures. According to Yukl (2013), "most researchers evaluate leadership effectiveness in terms of the consequences of influence on a single individual, a team or group, or an organization" (p. 8). In addition to confirming a positive and significant correlation between transformational leadership and leader effectiveness, several meta-analyses (Dumdum et al., 2013; Gui et al., 2020; Hoch et al., 2018; Judge & Piccolo, 2004; Lowe et al., 1996) also revealed transformational leadership's superiority in predicting leader effectiveness over other leadership constructs. The multilevel effectiveness of transformational leadership refers to the positive relationship between transformational leadership and outcomes on the level of leader, follower, group, and organization (Banks et al., 2016; Gui et al., 2020; Wang et al., 2011). Considering that these outcomes are also classified as relational (e.g., leader-member exchange, trust in leader), attitudinal (e.g., leader effectiveness, job satisfaction, empowerment, engagement, organizational commitment), and behavioral (e.g., leader, follower, group, and organization performance, creativity and innovation, extra effort) (Banks et al., 2016; Gui et al., 2020), the effectiveness of transformational leadership can be considered multifaceted. This paper aims to reveal the intellectual and conceptual structure of research on the effectiveness of transformational leadership. For this purpose, a bibliometric review was conducted using science mapping techniques. Existing bibliometric reviews include research on transformational leadership in general (Affandie & Churiyah, 2022; Ahmad et al., 2021; Malodia & Arora, 2024) and in specific contexts (Aydogdu, 2024; Karakose et al., 2023). They mostly combine performance analysis and science mapping, which differ in their purpose. Our review specifically refers to research on transformational leadership in connection to its effectiveness and focuses exclusively on science mapping of the field. Additionally, it refers to the period from 2014 to 2024, thus presenting a systematic overview of research on the effectiveness of transformational leadership in the last decade.

2. METHODS

Bibliometric reviews can contribute to the advancement of both theory and practice by mapping knowledge and generating ideas for future research and applications (Donthu et al., 2021; Mukherjee et al., 2022). They provide a systematic, objective and reproducible overview of the literature based on a quantitative approach, intending to draw conclusions concerning qualitative aspects (Mukherjee et al., 2022; Wallin, 2005). This method is increasingly used in various scientific fields due to the availability of bibliometric software and online scientific databases, as well as its potential to produce highly impactful research (Donthu et al., 2021).

To accomplish the aim of this study, we conducted a bibliometric review using a science mapping technique that uncovers knowledge clusters in the research field based on the relationships between research constituents and therefore can offer insight into the structure of the research field (Donthu et al., 2021). The intellectual structure reveals the most influential authors, publications, or journals, while the conceptual structure shows the main themes and patterns of the research field (Khare & Jain, 2022). Science mapping was conducted by using three bibliometric techniques: co-citation analysis, bibliographic coupling, and co-word analysis. Co-citation analysis derives thematic clusters based on cited publications "to construct measures of similarity between documents, authors or journals" (Zupic & Cater, 2015, p. 3). Bibliographic coupling "uses the number of references shared by two documents as a measure of the similarity between them" (Zupic & Cater, 2015, p. 5) and thematic clusters are based on the citing publications. Co-word analysis "uses the words in documents to establish relationships and build a conceptual structure of the domain" (Zupic & Cater, 2015, p. 6). The search of publications included in this bibliometric review was conducted in the Web of Science Core Collection database on August 22, 2024. The searched terms were "transformational leadership" AND "effectiveness" included in the title, abstract, and/or keywords. The search was limited to the period 2014-2024 to present a systematic overview of the literature on the effectiveness of transformational in the last decade. It included all research fields and journal articles in English only. The total number of articles found amounted to 818. Most articles were from the fields of business economics (456), psychology (200), and social sciences - other topics (66). VOSviewer software (version 1.6.18) developed by Van Eck and Waltman (2010) was used to conduct bibliometric analyses and create network visualizations.

3. RESULTS AND DISCUSSION

3.1. Co-citation analysis

The unit of analysis was cited references and the minimum number of citations of a cited reference was set to 35. The full counting method was applied. Of the 42,859 cited references, 58 items met the threshold. After removing 2 items marked as "anonymous, thesis" and "anonymous, 2005, transformational leadership", the total strength of the co-citation links with other cited references was calculated for each of the 56 items. The item "anonymous, 1985, leadership and performance beyond expectations" was not removed as it refers to the seminal work of Bass (1985). Figure 1 illustrates the resulting co-citation network.

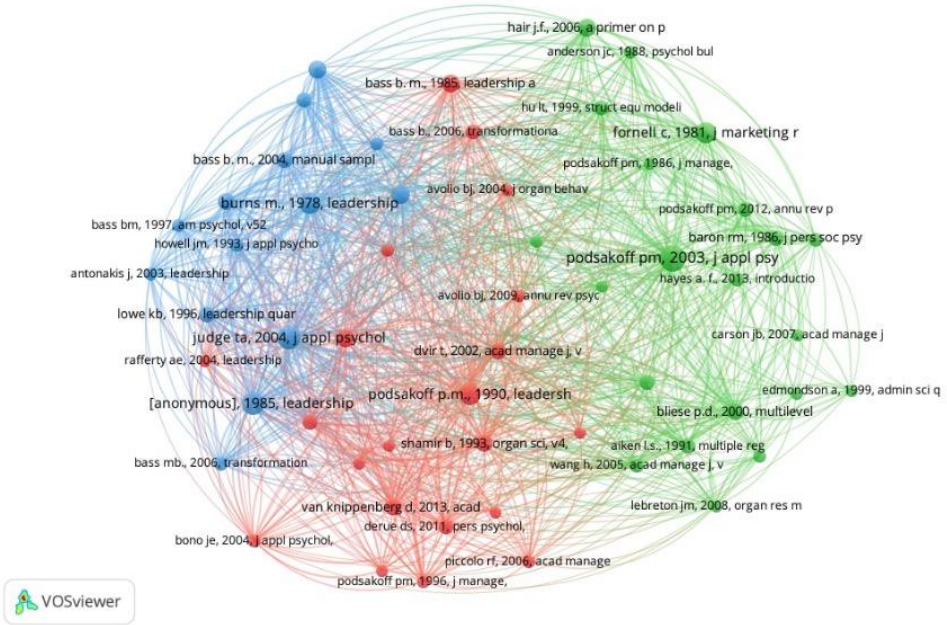

Figure 1: Co-citation network

The cluster *Effectiveness across different levels* marked in red includes 21 items. Cited references with the highest link strength are Podsakoff et al. (1990), Bass (1999), Shamir et al. (1993), Bass (1985), Wang et al. (2011), and Dvir et al. (2002). This cluster includes studies that describe and examine the effectiveness of transformational leadership in terms of performance and development across different levels (leader, follower, team, and organization). The cluster *Research methods* marked in green includes 21 items. The main cited references are Podsakoff et al. (2003), Fornell and Larcker (1981), Bliese (2000), and Hair et al. (2006). These publications describe structural equation modeling, common method biases, and data aggregation and analysis methods. The cluster *Conceptualization and comparisons with transactional leadership* marked in blue includes 14 items. The key cited references are Judge and Piccolo (2004), Bass (1985), Burns (1978), Bass et al. (2003), and Avolio et al. (1999). This cluster provides conceptual foundations of Bass's transformational leadership and its comparisons to transactional leadership.

The co-citation analysis uncovered seminal publications that represent the conceptual and methodological foundation of research on the effectiveness of transformational leadership. It revealed that the initial research confirmed the augmentation effect and greater effectiveness of transformational leadership compared to transactional leadership, as well as the multilevel effectiveness of transformational leadership.

3.2. Bibliographic coupling

The unit of analysis was documents and the minimum number of citations of a document was set to 50. The full counting method was applied. Of the 819 documents, 71 items met the threshold for which the total strength of the bibliographic coupling links with other documents was calculated to form the bibliographic coupling network (Figure 2).

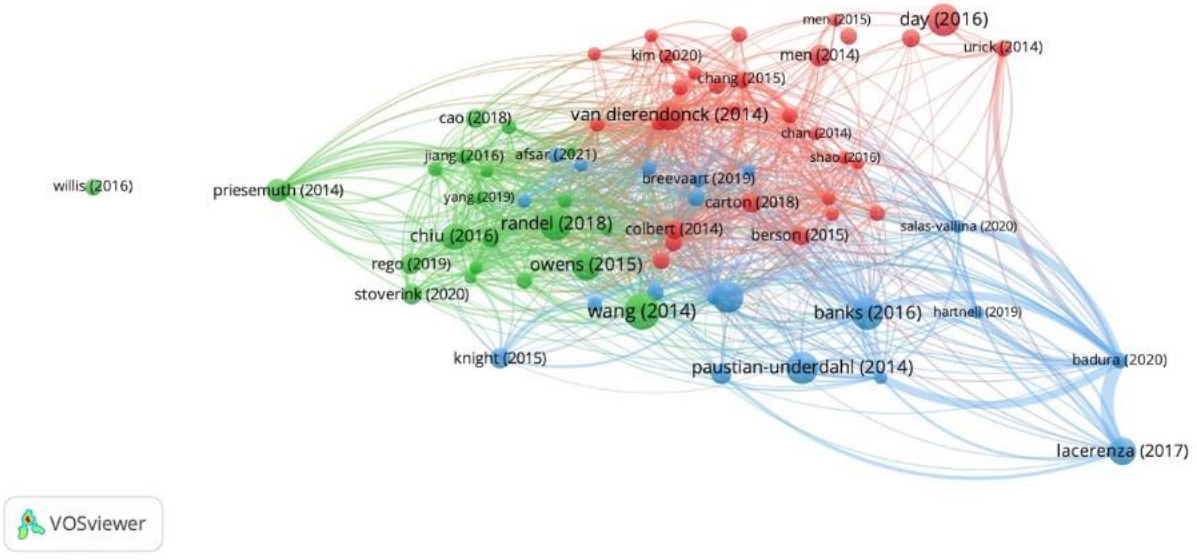

Figure 2: Bibliographic coupling network

The cluster *Organizational effectiveness* marked in red includes 30 items. The documents with the highest link strength are Zhang et al. (2015), Prasad and Junni (2016), Colbert et al. (2014), Kim and Shin (2019), and Van Dierendonck et al. (2014). This cluster focuses on the effects of transformational leadership on organizational effectiveness by examining follower outcomes such as organizational commitment, organizational innovation, empowerment, and work engagement. The cluster *Team effectiveness* marked in green includes 21 items.

Wang et al. (2014), Chiu et al. (2016), Priesemuth et al. (2014), and Buengeler et al. (2016) as the citing documents with the highest link strength mainly explore the impact of transformational and shared leadership behaviors on team effectiveness. The cluster *Drivers, characteristics and effects of leadership behaviors* marked in blue includes 20 items. The citing references with the highest link strength are Badura et al. (2020), Lacerenza et al. (2017), Banks et al. (2016), Salas-Vallina et al. (2020), and Kong et al. (2019). This cluster explores various factors influencing the emergence and effectiveness of transformational leadership and other leadership approaches. The bibliographic coupling revealed that the research in the last decade was focused on examining the impact of transformational leadership on organizational and team effectiveness. It also indicated that the effectiveness of transformational leadership can be considered multifaceted, given that it can be researched in connection with various leadership outcomes.

3.3. Co-word analysis

The unit of analysis was author keywords and the minimum number of occurrences of a keyword was set to 5. The full counting method was applied. Of the 2,205 keywords, 90 met the threshold for which the total strength of the co-occurrence links with other keywords was calculated. The keywords "meta-analysis", "china" and "quasi-experiment" were removed since they were not relevant to uncovering the conceptual structure of the research field. Figure 3 illustrates the resulting co-word network.

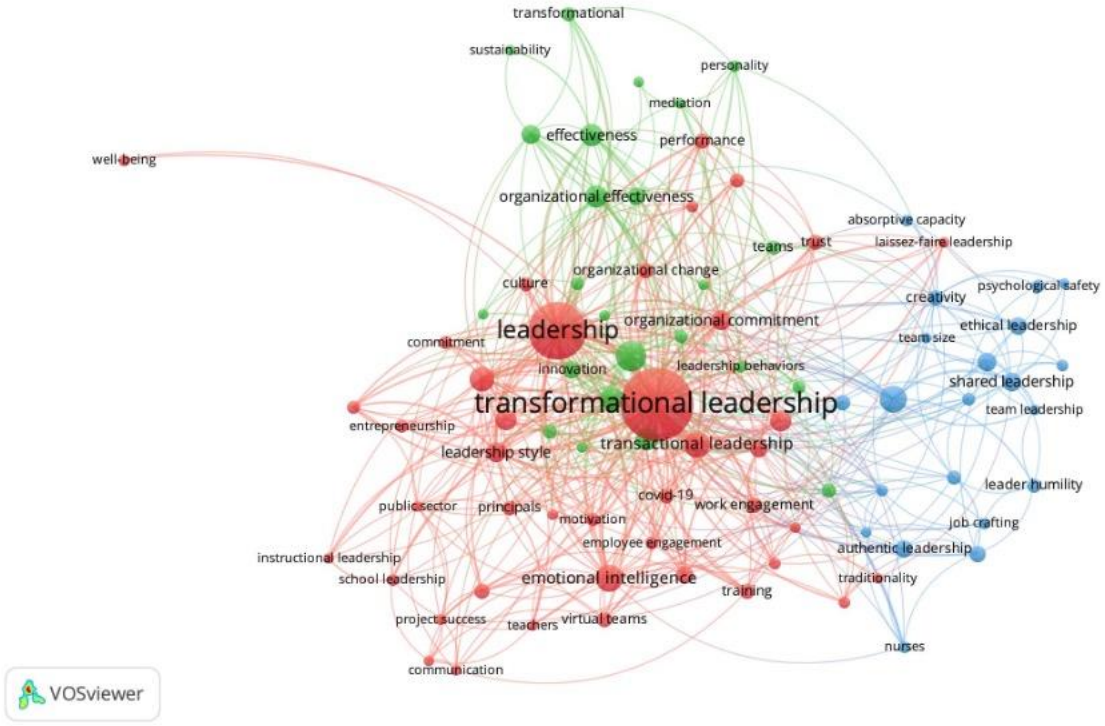

Figure 3: Co-word network

The cluster *Leadership approaches and effectiveness* marked in red includes 42 items. The keywords with the highest link strength are "transformational leadership", "leadership", "transactional leadership", "emotional intelligence", "leadership style(s)", "organizational commitment", "organizational citizenship behavior", "leader effectiveness", "performance", and "training". A keyword that started to appear concerning the theme of this cluster is "well-being". The cluster *Organizational effectiveness* marked in green includes 24 items. The keywords "leadership effectiveness", "organizational effectiveness", "job satisfaction", "leadership development", "effectiveness", "organizational culture",

"innovation", and "knowledge sharing" have the highest link strength. This cluster also includes the keyword "sustainability" which currently has a low link strength and occurrence. The cluster *Team effectiveness* marked in blue includes 21 items. Its main keywords are "team effectiveness", "shared leadership", "ethical leadership", "authentic leadership", "team leadership", "team performance", "team creativity", "creativity", and "innovative work behavior". "Cultural intelligence", "job crafting", and "psychological safety" are also included in this cluster, although with a low link strength. The results of the co-word analysis are consistent with the thematic clusters formed based on the co-citation analysis and bibliographic coupling. The co-word analysis indicated that the research in the last decade did not cover intercultural effectiveness. It also revealed that other increasingly important themes such as sustainability and well-being are still under-researched in connection to the effectiveness of transformational leadership. Thus, this analysis provides a foundation for future research recommendations.

4. CONCLUSION

This study contributes to the leadership literature by providing a systematic bibliometric review of research on the effectiveness of transformational leadership in the last decade. The conducted science mapping of the intellectual and conceptual structure of the research field offers insights that advance understanding of the multilevel and multifaceted effectiveness of transformational leadership. The results of bibliometric analyses reveal that the multilevel effectiveness of transformational leadership is reflected in its outcomes on the level of leader, follower, team, and organization. The variety of transformational leadership outcomes that contribute to its effectiveness and the augmentation effect related to the improvement of transactional leadership effectiveness indicate the multifaceted effectiveness of transformational leadership. This paper has practical implications for leaders, human resources managers, and leadership development specialists. Research findings could raise practitioners' awareness of the importance of transformational leadership and inspire its development and demonstration to enhance the effectiveness at multiple levels and in multiple areas. The main limitation of the study is that the bibliometric review was based exclusively on articles from the Web of Science Core Collection database, while the inclusion of other databases could have resulted in different findings. To address the identified knowledge gaps, future research could be directed at examining the intercultural effectiveness of transformational leadership and its effectiveness in connection with sustainability and well-being as particularly important themes in contemporary organizational leadership.

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THE INFLUENCE OF WOMEN ON THE ECONOMY - SELECTED ASPECTS

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ABSTRACT

Womenomics is a term coined by Kathy Matsui, scientist and chief Japan strategist at Goldman Sachs Japan, which refers to theories examining how the advancement of women in economy, business and society links to increased development rates. With the lenses of both macro and microeconomics, demonstrates through data, how countries where women have equal status in government, work and social standing, tend to do better economically. It is also true of businesses as evidenced by the results of different study - in general, companies with more women on their boards outperformed companies with exclusively male board members. The growing purchasing power of women combined with their increasing decision-making in their own households is also of great importance. Women, through their purchasing decisions and consumption, also significantly influence the stimulation of the economy. Therefore, it can be said that the women's economy is the economy of the future. Every year, the quantitative and qualitative impact and contribution of women to the economy increases, at every possible level. A future marked by greater and growing participation of women in socio-economic life seems inevitable.

Keywords: *the role of women in the economy, the woman as a consumer, womenomics*

1. INTRODUCTION

For many years, women were excluded from the social and economic life of societies, and their roles were mainly limited to running the household and caring for children. Until the 20th century, women in Europe, who made up half of the population of this region, did not have the same civil rights as men. This was argued to be due to the fundamental physiological and psychological differences between the sexes. According to prevailing beliefs, a woman should devote herself to the family, because she was a dependent being. In this capacity, the traditional family model - referred to as the only natural one - has been developing for hundreds of years. In literature, we can find that it contained rigidly defined roles, rights and obligations of women. A woman was supposed to be primarily a wife and mother, i.e. take care of the house, cook and raise children. She had a fixed daily rhythm, was able to easily manage her time and responsibilities, and had no difficulty in reconciling them. The situation of women changed significantly only in the second half of the 20th century.

In the last few decades, there has been a significant increase in interest in research on women as a social group. The turn of the XX/XXI century brought a particular intensification of research on the socio-economic situation of women. These studies often emphasize the "two-job" nature of women work resulting from professional and family activity. The social role of women related to fulfilling household duties is undoubtedly of great importance in the functioning of the entire entity, which is the household. Nevertheless, professional work is the second important area of a woman's life, which translates into the economic situation of the entity in which she functions. The study aims to show the role of women in the economic life of societies. The concept of "womenomics" is central to this discussion, typically analyzed in terms of government policies, women's impact on the economy, their significance in the labor market, and trends in their purchasing behavior.

2. THE MACROECONOMIC ROLE OF WOMEN

The term "womenomics," a blend of "women" and "economics," refers to the economic contributions of women. It is commonly used to describe the increasing role of women in national economic and social spheres (Wittenberg-Cox, Maitland, 2013). The concept originated in Japan in the early 1990s when Kathy Matsui, Vice President and Chief Strategist for Japanese strategy at Goldman Sachs Japan, addressed the issue of women's advancement in both society and the workforce in relation to the country's economic growth. Matsui and her team highlighted the potential for economic expansion through increased female participation in the labor force. Their research, conducted from both macroeconomic and microeconomic perspectives, revealed that nations where women have equal standing with men in governance, employment, and social status tend to handle professional and economic challenges better. Matsui's groundbreaking theory suggested that eliminating structural barriers in the female labor market could boost GDP growth. Moreover, granting women equal access to economic participation could yield both economic and social benefits (Macnaughtan, 2015). Building on this idea, in 2013, Japanese Prime Minister Shinzo Abe launched a progressive initiative to enhance women's employment and strengthen their position in Japan's labor market. This policy, dubbed "Womenomics," became a central component of Abe's economic growth strategy. Although Japan had experienced strong postwar economic growth, it faced repeated financial crises, recessions, and deflation by the late 20th century. Public debt was a major issue for Japan, reaching a few hundred % of its annual GDP in 2013, compounded by the rapid aging of its population (Schad-Seifert, 2022). As part of Prime Minister Abe's efforts to empower women in the economy, he proposed structural reforms aimed at shifting the traditional role of women beyond marriage, childbirth, and child-rearing, encouraging them to pursue their aspirations and professional goals. Abe envisioned a society where women would have the opportunity to "make your presence known". He recognized the need to create businesses that harnessed the economic potential of women, in part to counterbalance the shrinking labor force. Although Abe's goals were sound and validated in various contexts, they did not fully materialize in Japan. The country's deeply rooted conservatism, which maintained that a woman's primary role was as a wife, mother, and homemaker, was seen as a significant barrier to enhancing gender diversity in the labor market (Niemczyk, Gródek-Szostak, Seweryn, Grzega, 2024).

Japan's neoliberal policies have certainly opened up more work opportunities for women, but the country's deeply ingrained culture has prevented many women from "full development". In hindsight, despite the efforts of various Japanese governments to promote gender equality, progress in this area has been slow, likely hindering faster economic growth. Both in Japan and globally, women's equal participation in economic life has been slow, prompting media and scholars to critique womenomics as an unrealistic political concept without effective implementation tools. Many women continue to face barriers to full-time employment, and those in the workforce often occupy secondary roles with limited opportunities for advancement and earnings. This issue is further exacerbated by the shortage of female role models in leadership positions (Elysia, Juniari, & Devi, 2023; Fleglova, 2017).

Today, womenomics is a highly significant topic of interest for researchers across various disciplines, including economics and management. The concept has evolved to encompass a broader scope, applicable to diverse research perspectives in both macro and microeconomics. It is most commonly analyzed in the context of:

- state policies and the impact of women on the economy,
- the role of women in the labor market,
- their position in business and women's coustomer behavior.

Focusing on the macroeconomic role of women, womenomics is viewed as a phenomenon that reflects the increasing influence of women in national economic and social life. As scholars Vera Mackie and Ayako Kano stated in a speech to UN members: “Feminism is a policy aimed at strengthening the economy and the nation, not just improving the situation of women” (Szendi Schieder, 2014). Gender equality and the full utilization of women’s potential in the economy have become essential for social and economic development. The limited participation of women in national socioeconomic and political life prior to the end of the 20th century stemmed from the belief that these were male-dominated spheres. However, the 21st century has shifted this perception, marking an end to viewing women as passive participants and fostering numerous initiatives that involve women in development projects. In 2006, The Economist declared that the future of the global economy lies with women. Reihan Salam echoed this sentiment in Foreign Policy, suggesting the end of the "macho era" and linking the economic downturn to risky, male-dominated ventures. He coined the term "hecession" to describe a recession caused by the failure of traditionally male-driven sectors, such as construction and heavy industry (Woźniak, 2013). As women now account for about 60% of university graduates in developed countries, the concept of "womenomics" highlights their increasing role in shaping the economy, driven by their education, skills, and talents (Niemczyk, Gródek-Szostak, Seweryn, Grzega, 2024). Today, womenomics is a prominent topic in discussions surrounding economic, social, and educational policy. Efforts to advance this concept encompass a variety of initiatives, including gender equality legislation, educational programs, and investments in child and elder care services. At its core, womenomics as a national policy seeks to harness the full potential of women in the economy by promoting gender parity, supporting women in the workplace, and addressing barriers that hinder their professional progress (Schad-Seifert, 2022). However, significant challenges remain in implementing effective solutions, such as addressing wage gaps, overcoming social stigmas, and tackling the dual burden women often face as homemakers, mothers, and full-time employees. Moreover, supportive policies are essential to ensure equal career opportunities for women (Elysia, Juniari, & Devi, 2023). The increasing focus on women's role in economic development was underscored by Claudia Goldin being awarded the Nobel Prize in Economics. Goldin, the third woman to win this award and the first to be recognized exclusively in this category, conducted extensive research on the gender pay gap over two centuries. Her work demonstrates that gender inequality hampers economic growth. She argues that women’s lower earnings for the same work limit their opportunities and reduce the economy's capacity to fully leverage its human resources. Goldin also emphasizes that time spent raising children should be considered an economic investment, as women's labor directly influences social capital and retirement security. Her research highlights the challenges women face in balancing work and home responsibilities, advocating for equal career opportunities and comprehensive social support systems. In countries like Finland and Sweden, where empathy and cooperation are emphasized, women have higher employment rates. In contrast, nations that prioritize masculine values such as competition and aggression, like Romania, see lower female participation in the workforce. Achieving gender parity not only promotes social justice but also fosters sustainable and long-term economic growth (Perrin, 2024; Goldin, 2023; Podyma, 2023). In conclusion, women play a crucial role in macroeconomic growth. Representing half of the population, their participation in the labor market can significantly enhance productivity and increase GDP. For instance, a UK government-appointed commission found that better utilizing women's skills could boost the country's GDP by 2%. Additionally, the head of the IMF, Christine Lagarde, and Norway's Prime Minister, Erna Solberg, noted that raising women's labor market participation to the same level as men's could lead to substantial GDP growth, ranging from 9% to 21% (Urs, 2018; Panda, 2017).

3.THE WOMEN ON THE LABOR MARKET

On the business side of womenomics, women were initially hired in companies as part of diversity and equal opportunity policies. Over time, however, women have come to be viewed as valuable assets for profit. Numerous studies conducted across various locations—from Michigan and California to Norway—support the concept of the "asset-to-estrogen ratio," demonstrating that women are not just valuable employees but often irreplaceable (Shipman & Kay, 2010). In 2019, Griffin provided evidence that companies with women in management positions are more profitable, better organized, more responsible, motivated, and innovative (Griffin, 2019, p. 1224). Research suggests that women are generally less prone to risk and aggressive behavior compared to their male counterparts, and increasing female employment can mitigate risky behaviors often associated with male leaders in corporations and financial institutions (Eisenstein, 2017, p. 38). Matsui, Suzuki, and Tatebe (2019) found a positive correlation between gender-diverse leadership teams and favorable company performance. This research was cited after the US financial crisis as evidence that more women in the financial sector might have helped prevent the crisis or mitigate its effects (Prügl, 2012). In 2001, Professor Roy Adler's study published in the Harvard Business Review revealed that companies with higher percentages of female employees performed better financially. Adler and his colleagues analyzed data from over two hundred Fortune 500 companies and found that the top twenty-five companies with the highest female employment achieved above-industry median results (Urs, 2018). Professor Harvey Wagner from the University of North Carolina famously stated, "If you analyze a company with no women on its management board, you will find a company with problems." Additionally, separate studies by McKinsey and Catalyst in 2007 demonstrated that companies in Europe and the US with more women on their boards were more profitable.The banking crisis and the collapse of Lehman Brothers sparked debates about whether increased female leadership could improve corporate governance. The notion that having more women in leadership might have prevented the collapse led to theories suggesting that women could help protect the economy from future financial crises and stimulate recovery in struggling economies (Strauß, 2021; Girardone et al., 2021; Griffin, 2019). McKinsey's research has reaffirmed that having more women in management roles leads to improved financial performance. Reflecting these findings, the Swiss investment firm Naissance Capital launched the Women's Leadership Fund—a $2 billion initiative—in January 2018 to invest in companies with women on their management boards. In Norway, the government, convinced of women's economic contributions, mandated that women occupy 40% of board positions in every company. This measure was driven by a desire to enhance company competitiveness and profitability rather than purely for reasons of political correctness. Further research from Cranfield University School of Management in the UK shows that companies with women on their boards perform better than their less diverse counterparts. Additionally, a study by Leeds Business School found that having at least one woman on the board reduced the risk of company liquidation by 20%, with the risk of bankruptcy further decreasing when two or three women directors were present (based on data from 17,000 UK companies) (Urs, 2018). These studies have contributed to the theoretical framework supporting the emergence of business feminism. Financial institutions, non-governmental organizations, and multinational corporations increasingly recognize women as an "untapped resource" with the potential for high returns on investment (Eisenstein, 2017; Roberts, 2012). This perspective underscores the importance of empowering women by integrating them into the market economy. Investing in women—by providing access to loans and increasing investment in human capital such as education and healthcare—can yield substantial benefits for businesses (Roberts, 2012). According to Eisenstein, involving women in addressing economic challenges can help restore and secure the future of existing business structures (Eisenstein, 2017; Calkin, 2018). Fodor, Glass, and Nagy (2018) argue that increasing the number of women in top corporate positions promotes

greater societal equality. Additionally, employing women enhances diversity of opinion, which can drive innovation and improve decision-making (Niemczyk, Gródek-Szostak, Seweryn, Grzega, 2024). Based on the research discussed, it is clear that employing and retaining women should no longer be viewed merely as a matter of political correctness or enhancing a company's image. Women contribute significant value in numerous ways. As employees, they are often conscientious, efficient, and effective, offering unique perspectives and work styles. Increased representation of women—referred to as the "feminine element"—can lead to qualitative improvements in organizational management and structure. Women tend to adopt a more democratic approach to managing their teams, placing greater emphasis on interpersonal harmony and strong group integration while actively working to resolve conflicts. They also demonstrate better tolerance for failure, greater flexibility, and adaptability compared to their male counterparts. Moreover, a higher percentage of women in senior management roles can positively influence organizational culture, potentially leading to more ethical business practices and a reduction in involvement with corrupt or morally questionable activities. Combining the insights from the discussion on womenomics and business feminism, it is evident that the increasing participation of women in professional life offers numerous direct and indirect social and economic benefits (Deloitte Polska, 2018). The phrase “the economy of the future is women” aptly reflects the growing impact of women’s professional activity. Women contribute their knowledge, commitment, organizational and communication skills, the ability to compromise, flexibility, and other soft skills that are crucial in fostering beneficial business relationships (PwC Polska, 2015). These attributes are highly valued in today’s labor market and influence both the demand side (e.g., households) and the supply side (e.g., enterprises and organizations). The enhanced participation of women ultimately drives economic development and boosts the competitiveness of economies (Fundacja Liderek Biznesu, 2017).

4.THE WOMAN AS AN ACTIVE CONSUMER

The third approach to womenomics highlights the role of women as active consumers, responsible for purchasing products to meet both personal and family needs.

A woman as a consumer means an economic entity that manifests consumer needs, i.e. needs that require consumer goods and/or services purchased on the market, produced in one’s own household or received free of charge or partially for a fee from other market entities, including the state. A woman can fulfill various roles in her household, including:

- purchase initiator - the person who directly came up with the idea to buy a specific consumer good or service,
- advisor - the person who supports the decision-maker, expresses their opinion and views on a given topic and influences the final decision,
- decision-maker - the person making the final decision on the purchase,
- supplier - the person making the purchase,
- user - the person who uses the purchased good or service individually or together with other household members.

Marketing experts emphasize that women are the most significant consumers in the 21st century and a driving force in the modern economy. Research from the Boston Consulting Group reveals that American women account for 90% over of home furnishings spending. They are also key decision-makers in choosing holiday offers, purchasing homes or apartments, and buying cars, with their influence at 92%, 91%, and 60%, respectively. As more women become professionally active and their earnings rise, they increasingly drive consumption patterns. EY's report, “The Role of Women in Global Economic Growth,” forecasts that by 2028, women will be responsible for up to 75% of total consumer spending.

To attract women, brands should offer products that assist in organizing their daily schedules and optimizing their time (Stopyra-Fiedorowicz, 2018). Kathy Matsui recognized this trend a decade ago by creating a portfolio of 115 companies that focus on female customers. This selection included businesses from various sectors such as textiles, beauty, financial services, and retail (Woźniak, 2013). The concept of womenomics thus encompasses the active role of women in the consumer goods and services market and reflects a significant trend in purchasing behavior. Women, as primary shoppers in their households, are responsible for purchasing not only for themselves but also for family members, including children, partners, and even distant relatives. They often influence purchases related to home needs, pets, and more. Men tend to act more as influencers rather than the primary decision-makers in these purchases. Given the substantial and growing influence of women in purchasing decisions, it's essential to consider trends such as the rising popularity of bio, food, cosmetic, and chemical products with "clean labels"—products with straightforward, health-conscious, and environmentally friendly compositions (Kowalska, 2018). This perspective on women as a powerful consumer force can assist companies in addressing climate concerns, diversity, and corporate responsibility standards (Heins, 2023). The increasing purchasing power and decision-making authority of women further underscore their role in driving economic stimulation through consumption(Niemczyk, Gródek-Szostak, Seweryn, Grzega, 2024).

5. CONCLUSION

The current situation of women in society and in the labour market is diverse, but every year we can see the growing position of women in the structures of society and in the labour market. In most developed countries, women have equal access to education and training. They can pursue ambitious goals in their careers. However, there are still many barriers that women have to face in their daily lives. Women still face challenges in the labour market, such as pay inequality, lack of representation in top management positions and a greater share of household responsibilities. There are initiatives at national, EU and global level that aim to improve the situation of women in these areas. Actions to improve gender equality are based on the introduction of a range of anti-discrimination laws promoting gender equality in the workplace and support for women's career development. The problem is the differences in the approaches to gender equality policies in different countries around the world. Some countries are more advanced in introducing anti-discrimination laws, support programmes for women in the labour market or education on gender equality, while in others these changes are taking place more slowly. There is no doubt that this situation is influenced by cultural differences and traditions, which may affect the perception of gender roles. In conclusion, considering the current global problems, the women’s economy represents the future of economic development. The quantitative and qualitative impact of women on the economy continues to grow, reflecting their increasing participation at all levels of socioeconomic life. The future will inevitably feature a greater and more influential role for women, underscoring their significance in contemporary and future economic landscapes (Tse et al., 2024). It resounds prominently in the words of the United States Ambassador Marek Brzeziński, spoken on the occasion of International Women's Day on March 8, 2024: "It's very simple - women must have an equal seat at the table, an equal voice in decision-making. This is a moral and strategic imperative, but also an imperative of national security and foreign policy. Women are shaping a better and brighter future for our countries and that is a fact. That is why not only today, but every day, we must continue to work for equality until it becomes a reality, not just words" (Brzeziński, 2024).

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SUSTAINABLE DEVELOPMENT AND LOGISTICS

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ABSTRACT

Sustainablity is all about balancing equaly between economic growth, environmental protection, and social equity for future generation is the core problem to achieve set sustainable development goals. Logistics has a significant influence on environment through direct transport pollution during goods transportation. In this context, ***green logistics*** *integrates environmentally friendly practices into the supply chain, minimizing ecological impacts, and promotes resource efficiency. Green logistics involves the adoption of diverse strategies to reduce the impact on environment. This approach not only supports environmental sustainability but also enhances business competitiveness through cost savings and improved stakeholder relations. By driving the transition toward greener supply chains, green logistics contributes significantly to sustainable development goals, ensuring a more responsible and resilient global economy. Aim of the article is to present a case study on how an organization can apply sustainable strategy into business processes by implementing environmental friendly practice into their business segments.*

Keywords: *sustainability, sustainable development, sustainable goals, logistics, green logistics.*

1. INTRODUCTION

Sustainable development has become a global priority as societies seek to address the growing challenges of increasingly frequent environmental disasters with disastrous consequences, hunger increase and resource deficiency. The concept of sustainable development, defined by the Brundtland Commission in 1987., emphasizes meeting the needs of the present without compromising the ability of future generations to meet their own needs (WCED, 1987). It integrates economic, environmental, and social dimensions, aiming to create a balanced and equitable approach to growth that benefits both people and the planet. In the pursuit of these goals, different industries and companies have to act in a more sustainable way, and the logistics sector seems to lead the way. In the field of sustainabile developement, green logistics has emerged as a critical practice that influences environmental sustainablity goals.

Logistics, which involves the transportation, storage, and distribution of goods, has a significant environmental impact, contributing to carbon emissions, energy consumption, and waste generation (McKinnon et al., 2015). Green logistics seeks to find inovative strategies to alleviate negative ecological effects by implementing green practice into companies processes. This can include optimizing transportation routes to reduce fuel consumption, using alternative energy sources, implementing reverse logistics to manage product returns and recycling, and minimizing packaging waste, recycling (Islam & Huda, 2018, Hashemi, 2021, Cao et al., 2021). By implementing inovative strategies in the supply chain, green logistics reduce negative environmental impact and endoreses long-term sustainability goals, economic efficiency and social responsibility. Our paper adresses the issue of how sustainable strategies like green logistics can be applied into companies business supply chain. To answer this question we used a case study method on the Ikea organization by analysing their annual sustainability report to see how and where Ikea integrates sustainable practice, like green logistics, into supply chain and to demonstrate their good practice example which positively affects environment.

2. GREEN LOGISTICS AND SUSTAINABILITY

Sustainable or green logistics represents a way of managing logistics processes that strive to reduce the negative impact on the environment while simultaneously maintaining economic efficiency (Teixeira et al., 2018). It includes economic, ecological and social aspects that aim to achieve the greatest possible sustainability business. According to Gruchmann et al. (2023), green logistics is an indispensable part of business today, especially in the context of growing social and political awareness of the need for sustainable development. This concept of green logistics has significantly evolved over years from becoming an insignificant concept to becoming a key driver of innovative strategies especially in transportation area. Examples of introducing sustainability into business are energy-efficient vehicles, optimization of routes, recycling and reuse of materials, and implementation of renewables energy sources. Sustainable logistics aims to achieve ecological balance, reduce harmful emissions emissions and resource consumption, and promote environmental responsibility throughout the supply chain (Begović, 2021: 21). The definition of economic sustainability represents the ability of an organization, sector or economy to generate profit in the long term, guarantee financial stability and enable economic benefits, while at the same time taking care of preserving resources for future generations. It is based on the principle that economic growth and development should not be achieved at the expense of the environment or society (MasterClass, 2022). Examples of the introduction of economic sustainability in business can be seen in using energy efficient technologies, business digitalization (Agrawal et al., 2022), packaging, recycling, logistics optimization. on the other hand, environmental protection through sustainable logistics includes the application of ecological principles and practices within logistics operations to minimize their negative impact on the environment (Croucher et al., 2014). Characteristics of environmental protection through sustainable logistics are emissions reduction, efficient use of resources, green infracstrukture, sustainable packaging, use of renewable energy sources, education and awareness (Grant et al., 2017). Further, Perkumienėet al. (2020) analysed sustainable tourim where the role of green logistics is important to reduce traffic and noise, and elements that influence environment. Also, green logistics and green procurement in the supply chain has many positive ifluences on the competitvenses of companies. This inovativenss in the supply chain considers using new technologies, alternative fuels, cuts down operating costs, considering different ways of transportation (Teixeira et al., 2018). Overall, sustainability in logistics is being achieved through innovative strategies and approaches that include many business aspects in diverse industries such as innovation of products, services, processes, new business models, etc. Therefore we further analyse what are innovative strategies and which strategies in logistics are being applied to reach competitiveness.

2.1. Innovative strategies in business

2.1.1. Innovative strategies

Companies without innovation today are companies without the vision and tommorrow. Without innovations, companies loose their compettieveness over a time. Regarding innovations, they can be incremental or radical (Coccia, 2017). Incremental innovation happens when organization continuously make small improvements in their everyday operations. Radical innovation happenes rarely and considers a completely novel way of operating business that was not practiced in the company before. Innvotive strategies bring many advantages to companies and the way of innovation and benefits are presented in Table 1.

The way of innovation	Strategic benefit	Example
Product or service novelty	Offering something new for the first time	Walkman, tablet, iPod, etc.
Process novelty	Offering it in ways others cannot manage- faster, lower cost, cutomized	Internet banking, online books selling
Complexity	Offering something that others find difficult to master	Rolls- Royce and aircraft engines
Legal protection of intellectual property	Offering something that others cannot do unless they pay a licence or other	Blockbuster drugs like Covid vaccine or Prozac, etc.
Extend a range of competitive factors	Move basis of competition	Japanese car manufacturer moved from price to quality, flexibility, choice, etc.
Timing	Being first or fast follower advantage	Amazon, google- others can follow but the advantage is on early movers
Robus/ platform design	Offering platforms on which other variations or generations can be built	Walkman architecture- through minidisk, CD, DVD, MP3, etc.
Rewriting the rules	Offering something that represents a completely new product or process concept- a different way of doing things	Typewriters versus computer word processing, electric cars versus fuel cars, etc..
Process reconfiguration	Rethinking the way in which bits of the system work like building more effective networks, outsorcing	Zara in clothing, Dell in computer, Toyota in its Supply Chain Management
Transferring across different application context	Recombining established elements for different markets	Polycarbonate wheels transferred from application market such as rolling luggage into children's toys- lightweight micro scooters
Others	Finding new ways to do things and obtain strategic advantage	Napster, E-bay, etc.

Table 1: Benefits of Innovative Stategies
(Source: Tidd & Bessant (2020: 14)

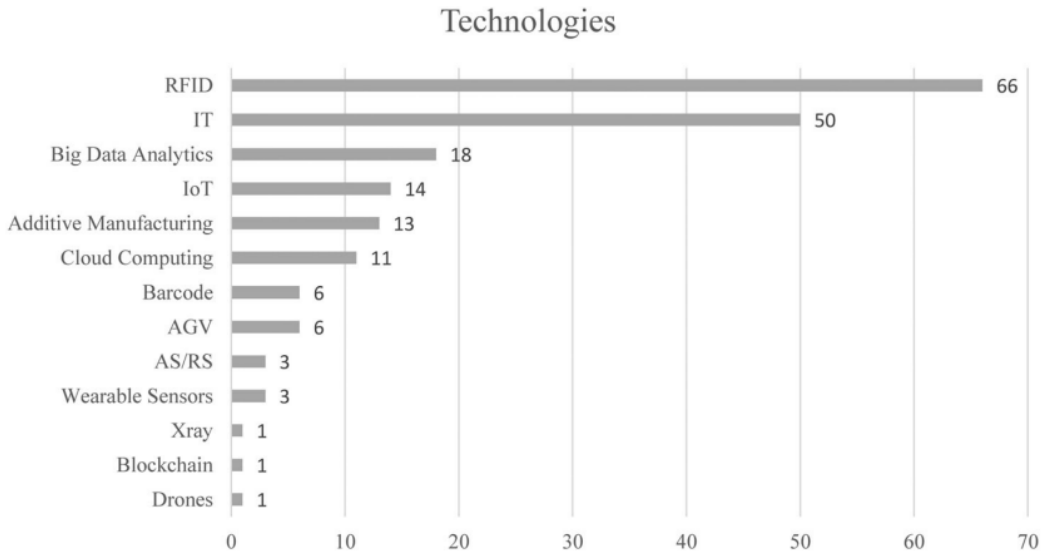
Also many researchers state the significant effect of innovation in many business aspects like Farida & Setiawan (2022) who found that innovation mediates the relation between business strategy and competitive advantage in a positive way.

2.1.2. Innovative strategies in logistics

Most innovations, in logistics and supply chain management, nowadays, are highly concentrated on implementing new technologies due high pressure of environmental impact of logistics. This is much known as the Logistics 4. or Smart Logistics representing the use of new technologies to cope with the changing demands of all interested parties and create new business models (Cimini et al., 2020).

Lagorio et al. (2020) in their literature review presented results of the use of main technologies in supply chain management and logistics (Figure 1).

Figure 1: Technologies identified in reserch papers
(Source: Lagorio et al. (2020:7)



As can be seen in Figure 1, most of the papers analyse the use of radio-frequency identification (RFID) in supply chain management and logistics, then information technology (IT) and Big Data Analytics. Evidence show that investments in IT influences company's quality, SC visibility, analysis of data and production (Brinch et al. 2018). Also the rise in adopting Big Data Analytics in supply chain management and logistics for planning and forecasting as well in different industries like (Maheshwari et al. 2021).

3. EXAMPLE OF THE BEST PRACTICE- CASE IKEA

The example of the best practice is a based on the contextual analysis of the company in which authors analyzed a specific example from furniture industry with an emphasis on sustainability strategies used by large organizations such as Ikea. An extensive document called Ingka Group Annual Summary and Sustainability Report which is publicly available on the Ikea website, served as a basis for the presentation of sustainable practice in Ikea company. In recent years, Ikea has achieved considerable success and innovation that has strengthened its global presence and influence in the furniture industry. Ikea has intensively digitized its own business in order to respond to new trends and consumer expectations. It developed applications, improved the online user experience and invested in augmented and virtual reality technologies. In recent

years, Ikea has achieved considerable success and innovation that has strengthened its global presence and influence in the furniture industry. Ikea has intensively digitized its own business in order to respond to new trends and consumer expectations (Ingka Group, 2024). In Table 2. authors represent a summarizes review of the Ikea sustanabile practice that organization applies into their practice with methods used and measures taken to achieve sustainable goals.

Business segment	Sustainability targets (business subsegment)	Methods used	Ikea measures and actions
Transportation and fleet management	Vehicle emissions and fuel efficiency	Electric and hybrid vehicles	Reconstruction of the vehicle fleet, regular maintenance
	Route optimization	Sophisticated technologies (GPS), algorithms for route optimization	Vehicle performance monitoring, data analysis, route adjustment
Storage	Energy efficiency	LED lighting, solar panels, efficient HVAC systems	Consumption monitoring, renewable sources, employee training
	Sustainable construction practices	Facilities certified according to LEED and BREEAM green building standards	Energy efficient technologies, sustainable materials, water supply management systems, waste recycling
Management of packaging and materials	Sustainable packaging	Recycled, biodegradable, minimalist packaging design	Reduction of packaging waste, reusable packaging encouragement, user education on recycling
	Waste management	Waste reduction, recycling and packaging optimization	Material recycling, customizable packaging
Reverse logistics and circular economy	Product return and recycling	Return processes of restoration, recycling and sale of returned products	"Buyback&Resell" program, material recycling
	Circular economy initiatives	A sustainable economy through product life extension and resource optimization	Product renewal, packaging optimization
Cooperation with suppliers and partners	Sustainable procurement	Sustainable supplier practices through IWAY standards, audits and environmental criteria	IWAY standard, emission reduction, recycled materials
	Cooperation and innovation	Collaborating with stakeholders on sustainable practices in logistics, fostering innovation through technology and research	Transport optimization, sustainable packaging, cooperation with technological partners

Monitoring, reporting and targets		Monitoring of CO2 emissions, energy consumption and waste with the aim of optimizing the environmental impact of logistics	Monitoring of emissions, ISO 14001, LEED certification
Employee and stakeholder engagement		Employee training and informing stakeholders about sustainability	Regular trainings, annual sustainability reports
Continuous improvement		Improving sustainability in logistics through performance analysis, process optimization and emissions monitoring	Monitoring of greenhouse gas emissions, optimization of transport routes, implementation of low-emission vehicles

Table 2: Business segments of sustainable practice in Ikea organization (Source:Authors work based on the Ikea Report)

We have divided eight business segments of Ikea and for each segment sustainability target was associated. For example, the transportation and fleet management segment, sustainability targets are vehicle emissions and fuel efficiency, and route optimization. In this area, Ikea uses electric and hybrid vehicles to reduce emmisions and increase fuel efficiency. To achieve this target, Ikea is introducing electric and hybrid vehicles as many as possible into their transportation. Also, to reduce total fuel consumption and its negative impact on environment it uses advanced technologies to plan the most efficient routes and monitors vechile performance.

4. CONCLUSION

Sustainable or green logistics is becoming more and more important in the business world, especially in terms of growing awareness about climate change and the need to preserve the environment. The analysis shows that Ikea stands out as a leading organization that implements and practice sustainability in many different segments of their business, thus positioning itself as a competitor in the market. Their comprehensive strategies, including collaboration with suppliers, innovation in logistics and constant monitoring of environmental performance, clearly demonstrates a commitment to sustainability. Through the implementation of sustainable solutions and goals, Ikea not only reduces its ecological footprint, but also educates and encourages its employees and customers to behave responsibly, further strengthening its role as a leader in sustainable business. This road of sustainability was not easy for Ikea.The organization was faced with numerous obstacles, including the high initial costs associated with investing into new technologies and infrastructure. The transition to more sustainable business models required significant changes in existing operational processes and adaptation of organizational culture. In addition, it was necessary to solve technical challenges related to the introduction of new systems and technologies within the existing logistics processes. Therefore, Ikea seems to be the mature example of implementing sustainable actions into their business all over their supply chain, representing a good practice for others. The case of Ikea shows that it is possible to achieve significant progress in sustainability, but this process requires a strategic approach, long-term investments and constant adaptation to changes
market conditions.

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MEASURING THE VR POTENTIAL: A SURVEY OF MEĐIMURJE COUNTY TOURISM DIRECTORS

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ABSTRACT

This study investigates the perception, potential, and challenges associated with virtual reality (VR) technology in the context of rural tourism, specifically in Međimurje County, Croatia. Through a survey of tourism board directors, the research explores their experiences with VR, their evaluation of its usefulness and ease of use, and their attitudes towards its potential contribution to sustainable tourism practices. Additionally, the study delves into the directors' beliefs regarding VR's ability to enhance tourism in the region and their vision for its role in the coming years. The findings of this research will provide valuable insights into the feasibility and benefits of incorporating VR into tourism strategies in Međimurje County, contributing to the development of sustainable and innovative tourism initiatives.

Keywords: *tourism, virtual reality, immersive experiences, digital tourism, technology in tourism, virtual reality adoption*

1. INTRODUCTION

Virtual reality (VR) is rapidly transforming the tourism industry, offering innovative experiences, educational opportunities, and accessibility to destinations worldwide. As VR technology continues to advance, it presents a significant opportunity for tourism boards and businesses to enhance customer experiences and drive revenue. While the extent of VR's impact on traditional tourism remains to be seen, it's undeniable that it poses a potential threat to countries heavily reliant on the sector. Tourism accounts for approximately 10% of global GDP and one in ten jobs, making it a crucial economic driver. (World Tourism Organization, 2018) VR tourism provides a virtual representation of real-world attractions, destinations, or visitor experiences, serving as a precursor to actual visits or an extension of previous experiences. Additionally, it can be used as a management tool to educate consumers and protect sensitive sites, acting as a substitute for visitation and fostering a deeper appreciation for environmental challenges. (Beck et al., 2019; Cheong, 1995; Gössling and Hall, 2018)

Given these developments, it's imperative to explore the readiness of rural tourism destinations like Međimurje County in Croatia to embrace VR tourism. This paper aims to investigate the opinions of tourism board directors in the region on the potential benefits, challenges, and necessary steps to successfully integrate VR into their tourism strategies.

2. LITERATURE REVIEW

The advent of information and communication technologies (ICTs) has profoundly influenced various industries, including tourism. Emerging ICTs are revolutionizing systems and processes, impacting operational, structural, and strategic levels. (Buhalis and Egger, 2006;

Beck et al., 2019) These technologies are reshaping how tourism products and services are managed, marketed, and promoted, leading to corresponding changes in traveler behavior, from inspiration to booking, planning, and experiencing travel. (Buhalis and Law, 2008; Pesonen, 2013; Neuhofer et al., 2014; Rincon et al., 2017; Beck et al., 2019). Among the cutting-edge immersive technologies gaining traction are augmented reality (AR), mixed reality (MR), and virtual reality (VR). VR offers a computer-generated simulated environment that is increasingly seen as a transformative force in the tourism industry. (Desai et al., 2014; Guttentag, 2010) While VR is still in its early stages, advancements in technology and affordability are driving its adoption and expanding its potential applications. (Disztinger et al., 2017; Marchiori et al., 2017; Tussyadiah et al., 2018) Tourism marketers can leverage VR to provide informative and authentic experiences, addressing the intangible nature of many tourism products and services. (Rainoldi et al., 2018; Tussyadiah et al., 2018; Sussmann and Vanhegan, 2000; Mirk and Hlavacs, 2015; Slater and Sanchez-Vives, 2016) VR can enrich the inspiration and information phases of the customer journey by offering immersive previews and detailed information. (Disztinger et al., 2017; Marchiori et al., 2017; Tussyadiah et al., 2017; Rainoldi et al., 2018) Additionally, VR has the potential to enhance on-site travel experiences and even influence post-travel engagement. (Cheong, 1995; Hobson and Williams, 1995; Guttentag, 2010; Marasco et al., 2018) The transformative power of VR in tourism has long been recognized. (Hobson and Williams, 1995; Williams and Hobson, 1995) VR is playing a pivotal role in shaping the industry as virtual digital worlds become more integrated into tourist lifestyles. (Mura et al., 2017) VR applications in tourism span planning and management, marketing and information exchange, entertainment, education, accessibility, and heritage preservation. (Guttentag, 2010; Wiltshier and Clarke, 2016) A particularly intriguing aspect of VR is its potential to augment or even replace traditional tourism products. (Musil and Pigel, 1994; Hobson and Williams, 1995; Williams and Hobson, 1995; Gutiérrez et al., 2008; Guttentag, 2010; Huang et al., 2015; Mura et al., 2017) In a VR environment, variables can be customized to create idealized virtual tourist experiences. (Slater and Sanchez-Vives, 2016)

While it's challenging to predict the exact extent to which VR will disrupt traditional tourism, it's crucial to acknowledge its potential consequences for countries heavily reliant on tourism revenue. (Cheong, 1995) Virtual reality can be seen as an alternative or complementary form of tourism, rather than a complete substitute. (Musil and Pigel 1994; Hobson and Williams, 1995; Sussmann and Vanhegan, 2000; Guttentag, 2010; Mura et al., 2017; Slater and Sanchez-Vives, 2016). Within the framework of the growing progress of tourism, Međimurje County has a valuable resource-attraction base, which is proven by numerous awards at national and European competitions. (Magdalenić, 2022; Mesarić Žabčić, 2007) Rural tourism in Međimurje County has the potential to meet the expectations of tourists, create additional income, employment and entrepreneurial opportunities for the local population, and that it supports other economic activities. Today's tourists understand the importance of caring for the environment, and for the same reason, they increasingly support destinations such as Međimurje, which promise a green transition, a circular economy, sustainable and responsible development, and socially responsible business. The motives of tourists coming to a rural destination are closely related to the natural beauty and cleanliness of the environment, as well as the preserved tradition and cultural heritage. Therefore, the implementation of sustainable tourism development is of crucial importance for creating the image of a desirable rural tourist destination to preserve its original natural beauty and maintain the value of the rural tourist product that initially motivated the rural tourist to visit. Magdalenić (2022) in her paper "Analysis of the Specificity of Rural Tourism in Međimurje" confirms that it makes sense to develop innovative tourist products for the purpose of increasing the attractiveness of the tourist offer if one wants to develop the specificity of the tourist destination.

VR is an innovative tourist product and can play a role in increasing the attractiveness of the tourist pound. The author (Magdalenić, 2022) also states that the lack of tourist superstructure and quality and innovative tourist offer, inconsistency of promotional activities and destination management, education of tourist staff and incoherence of initiatives, development partnership and cross-border cooperation are the biggest weaknesses recognized in the development plans. In this paper, the goal is to find out how much the directors of tourist boards of Međimurje County have become familiar with VR and what their views are.

3. METHODOLOGY AND RESULTS

This study utilized a quantitative research design, specifically a survey, to investigate the perception of virtual reality (VR) technology among tourism board directors in Međimurje County. All directors of tourism boards in the county were included in the study, ensuring a comprehensive understanding of the target population. A structured questionnaire was administered to collect data on participants' perceptions of VR technology, including perceived usefulness, perceived ease of use, and overall attitude. Methodology was derived from technology acceptance model which proposes that a user's beliefs (i.e., perceived usefulness and perceived ease of use) affect a user's intention to use a new system, which affects acceptance of the system (Lin et al., 2007). Quantitative analysis was employed to analyze the collected data, using descriptive statistics to summarize the findings. Ethical considerations were carefully addressed throughout the study. Informed consent was obtained from all participants, and confidentiality of responses was maintained. This analysis is based on a small sample of six participants (3 women, 3 men) who were surveyed about their experiences and attitudes towards virtual reality (VR). The sample is evenly divided between men and women. Most participants (5 out of 6) have had some VR experience. The participants have a range of experience in the field levels, from 3 to 22 years.

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	Years of Experience	Enhance	Invest	Contribute
Valid	6	6	6	6
Missing	0	0	0	0
Mean	12.500	4.167	3.333	4.333
Std. Deviation	6.411	1.329	2.066	1.033
Minimum	3.000	2.000	0.000	3.000
Maximum	22.000	5.000	5.000	5.000

Table 1. Descriptive Statistics of Tourism Board Directors' Perceptions

Participants rated VR highly, with an average score of 4.33 for its potential contributions and 4.17 for its ability to improve various areas. However, they were less enthusiastic about investing in VR experiences, giving them an average rating of 3.33. Overall, participants viewed VR as useful (4.21), easy to use (4.25), and had a positive attitude towards it (4.21). They estimate that their average budget for VR experiences is 6000 euros.

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	Perceived Usefulness	Perceived Ease of Use	Attitude
Valid	6	6	6
Missing	0	0	0
Mean	4.208	4.250	4.208
Std. Deviation	0.886	0.570	0.886
Minimum	3.000	3.500	3.000
Maximum	5.000	5.000	5.000

Table 2. Descriptive Statistics of Perceived Usefulness, Ease of Use, and Attitude Towards VR

Based on the survey results, participants generally view VR positively, perceiving it as useful, easy to use, and capable of contributing to various areas. However, there is a discrepancy between their positive perceptions and their willingness to invest in VR experiences. The average budget of 6000 euros suggests that cost may be a factor influencing investment decisions.

4. CONCLUSION AND LIMITATIONS

This study delves into the perceptions of tourism board directors in Međimurje County regarding virtual reality (VR) technology. The findings highlight a generally positive outlook on VR, with directors recognizing its potential to enhance the tourist experience and promote the region. While VR offers immersive experiences, detailed information, and improved accessibility, challenges such as technical difficulties, costs, and the need for further development hinder widespread adoption. Some directors expressed limited awareness of VR and its applications.

To overcome these barriers, it is essential to increase awareness of VR among tourism industry professionals. Providing training and education can help directors understand its potential and address technical challenges. Pilot projects can demonstrate the benefits of VR and alleviate concerns about costs and feasibility. Collaboration between tourism boards, technology providers, and researchers is crucial for developing and implementing effective VR applications. Future research should explore specific VR applications in tourism, assess its impact on visitor satisfaction and spending, and investigate the challenges and opportunities associated with its adoption. By addressing these limitations and recommendations, Međimurje County can leverage VR technology to enhance the visitor experience, promote the region, and foster sustainable growth.

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